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ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT FOR 2019

Coal Combustion Residual Rule Groundwater Monitoring System Compliance
Four Corners Power Plant
Fruitland, New Mexico

Submitted to:

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LIST OF ACRONYMS AND ABBREVIATIONS

§	Section
AECOM	AECOM Technical Services, Inc.
Annual Report	Annual Groundwater Monitoring and Corrective Action Report
Amec Foster Wheeler	Amec Foster Wheeler, Environment & Infrastructure, Inc.
amsl	above mean sea level
APS	Arizona Public Service
BTV(s)	Background Threshold Value(s)
CCR	coal combustion residuals
CCR units	CCR landfills and surface impoundments
CFR	Code of Federal Regulations
CSM	Conceptual Site Model
CWTP	Combined Waste Treatment Pond
DFADA	Dry Fly Ash Disposal Area
FCPP	Four Corners Power Plant
ft	foot, feet
GWPS(s)	Groundwater Protection Standard(s)
LAI	Lined Ash Impoundment
LDWP	Lined Decant Water Pond
MCL	Maximum Contaminant Level
mg/L	milligrams per liter
Multiunit 1	CCR multiunit comprised of the LAI and LDWP
Radiation Safety	Radiation Safety Engineering, Inc.
RWP	Return Water Pond
SAP	Sampling and Analysis Plan
SDAWP	Statistical Data Analysis Work Plan
SIT	Southern Intercept Trench
SSI(s)	statistically significant increase(s)
SSL(s)	statistically significant level(s)
TestAmerica	TestAmerica Laboratories, Inc.
URS	Upper Retention Sump
USEPA	United States Environmental Protection Agency
Wood	Wood Environment & Infrastructure Solutions, Inc.

1.0 INTRODUCTION

This Annual Groundwater Monitoring and Corrective Action Report for 2019 (Annual Report) was prepared on behalf of Arizona Public Service (APS) by Wood Environment & Infrastructure Solutions, Inc. (Wood) for the Four Corners Power Plant (FCPP) located in Fruitland, New Mexico. The Annual Report summarizes groundwater monitoring and corrective action data collected to support compliance with coal combustion residuals (CCR) groundwater monitoring requirements detailed in 40 Code of Federal Regulations (CFR) Sections (§) 257.90 through 257.98 (herein referred to as the CCR Rule) (Federal Register, 2018).

The CCR Rule became effective on October 19, 2015 and established standards for the disposal of CCR in landfills and surface impoundments (CCR units). In particular, the CCR Rule set forth groundwater monitoring and corrective action requirements for CCR units. The CCR Rule includes the requirement that an "annual groundwater monitoring and corrective action report" be prepared by January 31 for the preceding calendar year (the reporting period). This Annual Report prepared for the 2019 calendar year is intended to document the status of the groundwater monitoring and corrective action programs for each CCR unit, summarize key actions completed, and forecast key activities for 2020. APS additionally considers this report to meet the semiannual reporting requirements of 40 CFR §257.97(a) for selecting and designing remedies pursuant to the CCR Rule.

The remainder of this section (Section 1.0) provides a summary description of the power generating facility, the CCR units present at the facility, and the facility's environmental setting which forms the basis for assessment of underlying groundwater conditions. Sections 2.0 and 3.0 present groundwater monitoring and corrective action activities performed during the reporting period, respectively. Key activities identified for the upcoming year are presented in Section 4.0. Section 5.0 presents report references.

1.1 Site Background

1.1.1 Facility and CCR Unit Description

Facility Description. FCPP is an operating power plant owned by APS and four other utilities. The plant burns low sulfur coal in two electrical generating units (Units 4 and 5) and has a net generating capacity of 1,540 megawatts. FCPP formerly had five generating units and a capacity of 2,040 megawatts; Units 1, 2, and 3 were retired in December 2013 and decommissioned between 2014 and 2016. Coal burned at the plant is generally sourced from the nearby Navajo Mine (Navajo Transitional Energy Company, 2016).

Facility Location. The plant and associated infrastructure are located approximately 20 miles southwest of the city of Farmington, in the Colorado Plateau physiographic province of northwestern New Mexico (Figure 1-1). The land on which the plant resides is leased from the Navajo Nation and is primarily located in Section 36, Township 29 North, and Range 16 West of the northwest quadrant of the New Mexico Principal Meridian and Base Line.

CCR Unit Description. Plant infrastructure includes three single CCR units and one CCR multiunit (referred to as Multiunit 1) which are located in the main plant area and to the west of the plant within the FCPP lease boundary (also known as the disposal area), respectively (Figure 1-2). Table 1-1 summarizes the location,

function, operation, size/construction, and history of each unit. The boundaries of CCR units depicted in Figure 1-2 are based on available historical plans for the units.

1.1.2 Environmental Setting

Unless otherwise noted, the following information is abstracted from AECOM Technical Services, Inc. (AECOM), 2017.

Climate. The plant is located in a semi-arid climate on the western flank of the San Juan Basin. The area receives an average of 8.6 inches of precipitation and 12.6 inches of snow per year.

Topography. The main plant area of the FCPP is located at an elevation of approximately 5,340 to 5,360 feet (ft) above mean sea level (amsl). The topography of the FCPP area is characterized by rolling terrain, steep escarpments, and incised drainages/arroyos. In the vicinity of the plant, the ground surface is relatively flat, sloping to the west at approximately 20 ft per mile; however, surface drainage immediately near Morgan Lake flows towards the lake. About one mile west of the plant, the level ground surface drops rapidly to 5,200 ft amsl. Chaco Wash (a.k.a. Chaco River) is located west of this abrupt change in elevation and ephemerally flows north to the San Juan River.

Surface Water Hydrology. FCPP is situated on the southern bank of Morgan Lake, an approximately 1,300-acre man-made lake that has a maximum storage capacity of 39,000 acre-ft of water and supplies cooling water to the plant. Morgan Lake was formed by damming a westerly flowing stream (now known as 'No Name Wash') and is replenished by an underground pipeline (i.e., aqueduct) that routes flow from the San Juan River located approximately 3 miles north of the FCPP. The typical water surface elevation of the lake is 5,330 ft amsl. Morgan Dam discharges to 'No Name Wash' which flows west of the lake to Chaco Wash.

Site Geology. The San Juan Basin is a structural depression that lies at the eastern edge of the Colorado Plateau (Dames & Moore, 1988). The dominant geographic feature in the vicinity of FCPP is the Hogback Monocline located to the west of the plant; this monocline is a steep (38 degree) eastward-dipping flank composed of Cretaceous sedimentary rock (Dames & Moore, 1988).

There are two 'uppermost geologic units' that underlie the FCPP site and immediate vicinity. These units are expected to influence groundwater flow and result in variations in naturally occurring constituent concentrations across the site. The units are as follows:

- Pictured Cliffs Sandstone: The Pictured Cliffs Sandstone is the uppermost geologic unit beneath the plant and the CCR units located in this vicinity (i.e., the Upper Retention Sump [URS] and the Combined Waste Treatment Pond [CWTP] as depicted in Figure 1-2). This unit is a fine- to medium-grained marine sandstone. The lower portions of the Pictured Cliffs Sandstone represent a transitional sequence between this formation and the underlying Lewis Shale as indicated by alternating thin beds of very fine-grained sandstone and silty shale. The Pictured Cliffs Sandstone forms a capstone on an exposed cliff face located between the plant site and the CCR units located to the west (i.e., the Lined Ash Impoundment [LAI], Lined Decant Water Pond [LDWP] and the Dry Fly Ash Disposal Area [DFADA]).

- Lewis Shale: The Lewis Shale is a marine shale that contains evaporite deposits resulting in naturally occurring saline groundwater conditions. The Lewis Shale is the uppermost geologic unit that

underlies the LAI, LDWP, and DFADA and spans west of the Pictured Cliffs Sandstone cliff face approximately 1.5 miles westward to the base of the Hogback Monocline. The regional thickness of the Lewis Shale is approximately 500 ft and is underlain by Cliff House Sandstone. The Lewis Shale consists of a weathered shale subunit overlying a hard, unweathered shale subunit. The thickness of the weathered shale varies between 11 and 47 ft with an average thickness of 30 ft within the vicinity of the site (Dames & Moore, 1988). The weathered shale is not as thick when overlain by Pictured Cliffs Sandstone in the vicinity of the plant site. This subunit contains thin sandstone lenses that vary in thickness from 1 to 7 ft; the sandstone is fine to very fine-grained and cemented by calcium carbonate (Dames & Moore, 1988). The unweathered shale is significantly less permeable than the weathered shale. The unweathered shale is very fine-grained to silty, and contains periodic siltstone and sandstone lenses (Dames & Moore, 1988). The surface of the unweathered shale slopes towards the Chaco Wash at approximately the same slope as land surface (Dames & Moore, 1988) but displays some irregularity resulting in varying levels of saturated thickness in the weathered shale. The Lewis Shale is variably saturated and hydraulically interconnected with alluvial deposits of Chaco Wash. The low-permeability unweathered shale underlying the Pictured Cliffs Sandstone results in a perched saturated zone beneath the plant area.

Applicable Hydrostratigraphy. Three general hydrostratigraphic units are conceptualized beneath the FCPP and associated CCR units. These units form the basis for the Conceptual Site Model (CSM) developed by AECOM (2017) for the purpose of designing the site CCR groundwater monitoring system and establish the working basis for statistically evaluating groundwater conditions underlying the site.

The first hydrostratigraphic unit (Pictured Cliffs Sandstone) is dominant only under the plant area, which is located in an elevated area south of Morgan Lake (Figure 1-2). Two CCR units (i.e., the URS and CWTP) reside within this area. The Pictured Cliffs Sandstone is the uppermost water bearing unit for the plant area and extends from ground surface (between approximately 5,340 to 5,360 ft amsl) to approximately 5,300 ft amsl in the plant area. Groundwater in this area is strongly influenced by Morgan Lake (at a surface elevation of approximately 5,330 ft amsl) and generally flows northward towards the lake. However, construction and operations of the plant have resulted in disturbed ground conditions and associated impacts are not well understood.

The second hydrostratigraphic unit (Weathered Lewis Shale/Alluvium) underlies the Pictured Cliffs Sandstone in the plant area and the Multiunit 1/DFADA CCR units in the disposal area, approximately 1 mile west of the plant (Figure 1-2). The Weathered Lewis Shale and the hydraulically connected alluvial deposits along Chaco Wash are designated as the uppermost water bearing unit in the disposal area. Although the Lewis Shale is geologically continuous in this area, it is unsaturated in the vicinity of the DFADA. The water table in the Weathered Lewis Shale can exhibit local seasonal fluctuations that are attributed to interactions between rates of groundwater recharge and discharge (Dames & Moore, 1988) from/to Morgan Lake, historical unlined ponds, and Chaco Wash. Groundwater flow generally follows the surface topography and descends to the west-southwest in the disposal area, mainly in the weathered shale and in local alluvial channels that drain toward the Chaco Wash (APS, 2013).

The third hydrostratigraphic unit (Unweathered Lewis Shale) consists of the Unweathered Lewis Shale and is a regionally extensive confining unit that forms the base of the uppermost aquifers in the plant and disposal areas.

1.2 CCR Groundwater Monitoring System

Multiple monitoring wells are in place at FCPP to monitor groundwater conditions beneath the four site CCR units and support ongoing assessment of impacts from potential leakage. Table 1-2 identifies each well with associated CCR unit information, the date of well installation, and summary well construction details. Figure 1-2 presents a map with well locations.

Installation of the FCPP CCR groundwater monitoring system is summarized in the *CCR Monitoring Well Network Report and Certification* and is identified as compliant with 40 CFR §257.91(a) through (e) (AECOM, 2017). Per the CCR Rule, site monitoring systems are required to evaluate groundwater quality that is representative of background (i.e., groundwater that has not been affected by leakage from a CCR unit) and groundwater passing the downgradient boundary of each CCR unit, in the uppermost water bearing hydrostratigraphic unit underlying the CCR unit.

The FCPP CCR groundwater monitoring system was expanded in 2018 by the installation of several wells downgradient of the URS and Multiunit 1. The wells were installed to promote characterization of the nature and extent of Appendix IV constituents present at statistically significant levels (SSLs) that exceed Groundwater Protection Standards (GWPSs) downgradient of the CCR units. Well installation activities are discussed in Section 3.1.

1.2.1 Monitoring System Description

Background Groundwater Monitoring Wells. Background water quality at the site can be established by a single monitoring well or a group of monitoring wells. If a group of monitoring wells is used, these wells should be screened within the same lithologic unit, exhibit similar groundwater chemistry, illustrate similar statistical merits, and be supported by the CSM. The grouping and adequacy of background wells identified for FCPP to assess background water quality are assumed adequate until proven otherwise.

Per the *CCR Monitoring Well Network Report and Certification*, the following monitoring wells are designated as "background monitoring wells" for the respective geologic and hydrostratigraphic conditions underlying the FCPP (AECOM, 2017):

- Background Wells for the Pictured Cliffs Sandstone: Three wells (MW-71, MW-72, and MW-73) were installed to assess background groundwater quality for both the URS and the CWTP overlying the Pictured Cliffs Sandstone.
- Background Wells for the Weathered Lewis Shale/Alluvium: Seven wells upgradient to sidegradient of Multiunit 1 and the DFADA, including MW-12R1, MW-49A, MW-51, MW-50A, MW 43, MW-55R, and MW-74, are designated to assess background groundwater quality for the Weathered Lewis Shale/Alluvium. Many of these wells are routinely either dry or have a limited saturated thickness which precludes sampling; the wells are included in the program in case conditions change in the future.

Due to the natural heterogeneity of the geologic and hydrostratigraphic conditions underlying the FCPP, background constituent concentrations are expected to be spatially heterogeneous across the site. The site is also expected to exhibit temporal heterogeneity due to local climatic regimes, potential leakage from Morgan Lake, and potential operational activity at the site. The adequacy of designated background

monitoring wells will be assessed on an ongoing basis using groundwater elevation data, boron data, a working understanding of the spatial heterogeneity of geochemistry underlying the FCPP, and the statistical merits of the constituents of concern. Historical groundwater chemistry data may be consulted during this evaluation, but data preceding December 2011 will not be considered due to noted "matrix interference issues associated with saline waters" in samples analyzed prior to this date (APS, 2013).

Downgradient Monitoring Well Networks. A total of 23 downgradient wells are in place at the site to monitor the downgradient groundwater conditions of each CCR unit (Table 1-2; Figure 1-2). Thirteen of these monitoring wells are installed in the Pictured Cliffs Sandstone. The remaining ten other wells are completed in the Weathered Lewis Shale/Alluvium. The grouping of monitoring wells, spatial density, and coverage of the monitoring well network are assumed representative and adequate until proven otherwise. These wells are identified by respective CCR unit, as described below:

- URS Downgradient Wells (Pictured Cliffs Sandstone): The groundwater flow direction underlying the URS has historically been radially outward from the CCR unit. On this basis, nine wells, MW-66, MW-67, MW-68, MW-69, MW-70, MW-83, MW-84, MW-85 and MW-86 were installed around the perimeter and downgradient of the URS. URS downgradient wells are screened within the Pictured Cliffs Sandstone hydrostratigraphic unit.

- CWTP Downgradient Wells (Pictured Cliffs Sandstone): Similar to the URS, the groundwater flow direction underlying the CWTP is radially outward from the CCR unit. Four monitoring wells, including MW-62, MW-63, MW-64, and MW-65, were installed around the perimeter of the CWTP. The *CCR Monitoring Well Network Report and Certification* identifies these wells as screened within the Pictured Cliffs Sandstone hydrostratigraphic unit.

- Multiunit 1 Downgradient Wells (Weathered Lewis Shale/Alluvium): Six downgradient monitoring wells are in place below the toe of the western to southwestern edge of Multiunit 1: MW-7, MW 8, MW-40R, MW-61, MW-75, MW-76 and MW-87. Two wells, MW-40R and MW-76, are routinely either dry or have a limited saturated thickness which precludes sampling; the wells are included in the program in case conditions change in the future The screened interval for each Multiunit 1 downgradient well resides within the Weathered Lewis Shale/Alluvium hydrostratigraphic unit.

- DFADA Downgradient Wells (Weathered Lewis Shale/Alluvium): Four existing wells are identified downgradient of the DFADA: MW-13, MW-44, MW-10 and MW-48. Each well, except MW-48, is screened within the Weathered Lewis Shale/Alluvium hydrostratigraphic unit. The screened interval for MW-48 resides within the Unweathered Lewis Shale hydrostratigraphic unit. The downgradient DFADA wells are known to be dry; this groundwater monitoring system was designed to detect releases since the next underlying aquifer (in the Cliff House Sandstone) is separated from the CCR unit by several hundred ft of Lewis Shale, a regional aquitard.

Supplementary Site Monitoring Wells. There are many groundwater monitoring wells at the site that are not part of the CCR groundwater monitoring system but may provide useful information to the program. Table 1-2 and Figure 1-2 identify these wells.

1.2.2 Implemented Changes to Monitoring System

Most of the wells that comprise the site CCR groundwater monitoring system were installed prior to or during 2017 (Table 1-2). During the reporting period, implemented changes to the monitoring system included:

- Installation of CCR Wells at the Return Water Pond (RWP) – The RWP is a new CCR unit constructed during the reporting period that will receive slurried CCR from the plant and discharges from seepage collection systems in the disposal area. To address CCR Rule requirements, three monitoring wells were installed at the downgradient edge of the RWP in December 2019; documentation of well installation activities was not complete as of the end of the reporting period. Pursuant to 40 CFR §257.94(b)(2), APS will complete 8 rounds of initial monitoring at the compliance wells prior to discharging CCR into the RWP. Monitoring and statistical assessment of collected data from the new RWP will be conducted in accordance with an updated Sampling and Analysis Plan (SAP) and Statistical Data Analysis Work Plan (SDAWP), revised to include the RWP, when the unit is placed in service.

2.0 GROUNDWATER MONITORING PROGRAM

The groundwater monitoring and corrective action process defined in the CCR Rule includes a phased approach to groundwater monitoring, leading (if applicable) to the establishment of GWPSs for each CCR unit. Exceedances of the GWPSs that are determined to be statistically significant can trigger requirements for additional groundwater characterization and corrective action assessment followed by implementation.

The first phase of groundwater monitoring is the detection monitoring phase. This phase focuses on a set of constituents (listed in Appendix III of the CCR Rule) that are the more mobile components of CCR and therefore represent indicators of possible impacts from CCR in groundwater. If statistically significant increases (SSIs) of any of the Appendix III constituents relative to background conditions are detected in the downgradient waste boundary wells, and cannot be demonstrated to be associated with a source other than the CCR unit, then groundwater monitoring moves into the second phase, assessment monitoring.

The second phase of groundwater monitoring focuses on the constituents listed in Appendix IV of the CCR Rule. The Appendix IV constituents are generally less mobile and occur at lower concentrations in groundwater than the Appendix III constituents. Concentrations of Appendix IV constituents in downgradient wells are compared to GWPSs. The GWPSs, established for Appendix IV constituents only, are the higher of either the federal Safe Drinking Water Act Maximum Contaminant Level (MCL), alternative risk-based GWPSs established in the CCR Rule, or the background concentration for each constituent.

If exceedances of the GWPSs are determined to be occurring in the downgradient boundary wells at SSLs and no alternative sources for the exceedances can be demonstrated, then both additional groundwater characterization and assessment of corrective actions are initiated. Following assessment of corrective measures, a remedy (or set of remedial activities) is selected and implemented as the groundwater corrective action program for the CCR unit. According to the CCR Rule, groundwater corrective action will continue until compliance with the GWPSs has been attained in all impacted wells and sustained for a period of three consecutive years.

2.1 Program Status

2.1.1 Summary of Key Actions Completed

A summary of key actions conducted at the site during 2019 to address CCR Rule requirements is as follows:

- Documentation of Groundwater Monitoring Activities Conducted in 2018 - 40 CFR §257.90(e) requires that an Annual Groundwater Monitoring and Corrective Action Report for applicable sites be prepared for existing CCR units annually on January 31 of the following year. During the reporting period, APS prepared the *Annual Groundwater Monitoring and Corrective Action Report for 2018* (2018 Annual Report, Wood, 2019), placed the report in the facility's operating record, and posted the report to APS's CCR information webpage in accordance with 40 CFR §257.105(h)(1) and 40 CFR §257.106(h)(1).

- Continuation of the Detection Monitoring Program at the CWTP and DFADA – 40 CFR §257.94(b) requires the continuation of detection monitoring at a semiannual frequency for Appendix III constituents at CCR units where statistical analysis of Appendix III constituent data do not indicate an SSI over background. Section 2.2 presents the results of detection monitoring data collected on a semiannual basis from the CWTP and DFADA during 2019.

- Completion of Statistical Analyses for Collected Appendix III Constituents at the CWTP – 40 CFR §257.93(h) requires routine statistical analysis of Appendix III constituent data from CCR units in the detection monitoring stage. During the reporting period, APS performed two statistical analyses using updated analytical data and statistical methods for Appendix III constituent data collected from CWTP monitoring wells. The statistical analyses are summarized in Section 2.3.1.

- Conduct of an Alternative Source Demonstration (ASD) for Appendix III constituents at the CWTP – 40 CFR §257.94(e)(2) allows owners to evaluate whether a source other than the subject CCR unit resulted in declaring an SSI over background during a statistical analysis conducted pursuant to the CCR Rule. In response to background exceedances declared at wells downgradient of the CWTP, an ASD was prepared during the reporting period, which is summarized in Section 2.1.4.

- Characterization of the Nature and Extent of Potential Releases Indicated at the URS and Multiunit 1 – 40 CFR §257.95(g)(1) requires characterization of the nature and extent of releases from CCR units where one or more Appendix IV constituents exceed GWPSs at SSLs. Section 3.1 summarizes the results of a hydrogeologic investigation conducted during the reporting period to address this requirement.

- Preparation of a Corrective Measures Assessment (CMA) for the URS and Mulitunit 1 – 40 CFR §257.96(a) requires the owner/operator to complete a CMA within 90 days of detecting an Appendix IV constituent exceedance over the GWPS at an SSL. In response to GWPS exceedances at Multiunit 1 and the URS, APS demonstrated the need for a 60-day extension to the deadline and completed a CMA during the reporting period which is summarized in Section 3.3. The CMA was placed in the facility's operating record and posted to APS's CCR information webpage in accordance with 40 CFR §257.105(h)(10).

- Preparation of a Semiannual Progress Report on Remedy Selection for Multiunit 1 and the URS - 40 CFR §257.97(a) requires the preparation of semiannual reports which document the progress of remedy selection for CCR units that have potentially impacted groundwater. During the reporting period, APS prepared the first semiannual report to fulfill this requirement in July 2019. Activities supporting remedy selection conducted during the second semiannual reporting period of 2019 are summarized in Section 3.4.

- Installation of the RWP – The RWP is a new, multicelled CCR surface impoundment constructed during the reporting period to temporarily store flue gas desulfurization (FGD) system waste and leachate from the disposal area seepage intercept system in anticipation of LAI and LDWP (Multiunit 1) closure. The RWP is constructed with an alternative composite liner that meets the requirements of 40 CFR §257.72. Upon completion of the RWP, APS obtained certification that the liner was constructed in accordance with the requirements of the CCR Rule. A copy of the certification was placed in the facility's operating record and posted to APS's CCR information webpage on December 20, 2019. The location of the RWP is depicted on Figure 1-2.

- Installation of Downgradient Monitoring Wells at the RWP – 40 CFR §257.91(a)(2) requires a downgradient monitoring system to be installed at the waste boundary of CCR units. During the reporting period, APS drilled exploratory borings to evaluate flow direction in the uppermost aquifer beneath the RWP and installed three monitoring wells on the downgradient edge of the CCR unit. Documentation of the effort was ongoing at the time this Annual Report was prepared.

- Installation of Pre-Design Investigation Extraction Wells at the URS – Pursuant to the assessment of corrective measures initiated per 40 CFR §257.96 and discussed in Section 3, APS completed the drilling and installation of four pre-design investigation extraction wells at the URS. Documentation of the effort was ongoing at the time this Annual Report was prepared.

2.1.2 Problems Encountered and Resolutions to Problems

During the reporting period, a deviation from the monitoring schedule occurred when detection monitoring at the DFADA was not conducted as scheduled (see Section 2.2 for further discussion). APS reviewed the deviation and attributed the underlying cause of the problem to a programmatic issue with the complexity and evolving nature of CCR compliance monitoring at the site. Each unit has a separate monitoring schedule based on when monitoring program transitions have occurred and what the results of sampling have indicated.

To promote adherence to the monitoring schedule in the future, APS monitored select units earlier than scheduled during the last monitoring round of 2019 so that all site units will be monitored on the same semiannual schedule (i.e., the second and fourth monitoring quarter of each year) going forward. With a more routine schedule, process improvement actions will be implemented to more reliably track monitoring tasks and promptly rectify schedule deviations.

2.1.3 Groundwater Monitoring Program Transitions

No groundwater monitoring program transitions occurred during the reporting period.

2.1.4 Alternative Source Demonstrations

A statistical analysis of Appendix III constituent data collected in November 2018 from CCR wells downgradient of the CWTP (Section 2.3.1) declared SSIs over background for fluoride and pH and initial exceedances over background for boron and calcium on April 15, 2019. To address these exceedances, APS prepared an ASD (Appendix A) during the reporting period which considered the following potential alternative sources:

- Sampling and analysis errors;
- Anthropogenic causes; and
- Statistical method inadequacies due to natural variation in groundwater quality.

The ASD demonstrated that the exceedances were not indicative of a release from the CWTP, but rather the result of anthropogenic sources, surface-groundwater interactions, and natural spatial and potential temporal variations in groundwater quality. Recommendations from the ASD include:

- Updating the Background Threshold Values (BTVs) for boron and calcium using representative background well sample data with the addition of data collected semiannually since October 2017; and
- Performing intrawell statistical comparisons for pH in MW-64 and MW-65 and for fluoride in MW-62, MW-62, MW-64, and MW-65.

Based on these recommendations, APS prepared a revised statistical analysis for Appendix III constituents at the CWTP, which is summarized in Section 2.3.1.

2.2 Monitoring Data Collected

During 2019, APS conducted CCR groundwater monitoring at FCPP in accordance with the site SAP presented in the *Annual Groundwater Monitoring and Corrective Action Report for 2017* (Amec Foster Wheeler, 2018). The SAP documents the methods and procedures used to conduct groundwater sampling, analyze collected samples for CCR constituents, and assess associated analytical data for quality assurance purposes.

The following sections summarize groundwater monitoring activities conducted in 2019. Table 2-1 identifies when monitoring occurred and which units were monitored. Unless otherwise noted, detection monitoring included evaluation of collected samples for Appendix III constituents on a semiannual basis (40 CFR §257.94[b]) and assessment monitoring included evaluation of collected samples for all Appendix IV constituents on an annual basis (40 CFR §257.95[b]) and detected Appendix IV constituents as well as all Appendix III constituents on a semiannual basis (40 CFR §257.95[d][1]).

As indicated in Section 2.1.2 and Table 2-1, the DFADA wells were scheduled for monitoring in May 2019 but were inadvertently not monitored. These wells are completed in either the Weathered Lewis Shale/Alluvium or Unweathered Lewis Shale, which is known to be dry downgradient of the DFADA. Thus, the DFADA groundwater system was designed to detect releases by the presence of water (insignificant

amounts of condensate are known to accumulate in wells). Although the wells were not monitored in May 2019, they were monitored in December 2019 and were found to be dry or have less than 0.26 inches of water present, which is consistent with previous readings and indicates that a release from the DFADA did not occur in 2019.

Select wells that are routinely dry (or do not have enough water to sample) downgradient of Multiunit 1 were also scheduled for monitoring in May 2019 but were also inadvertently not monitored. Since these wells were monitored both in March and December 2019, the semiannual monitoring requirement was met.

2.2.1 Water Level Monitoring

Appendix B presents groundwater elevation data collected during groundwater sampling with hydrographs depicting collected groundwater elevations over time. Groundwater elevations in the Pictured Cliffs Sandstone (i.e., plant area) and Weathered Lewis Shale/Alluvium (i.e., disposal area) are graphed independently based on assessment of the data during initial CSM development; review of the data suggests that the two groundwater systems are likely not in direct communication. As shown in monitoring well hydrographs, groundwater elevations were relatively stable over the period monitored with the following exceptions:

- MW-8 and MW-76 (downgradient wells for Multiunit 1): An increase in water level elevations occurred at these wells during the reporting period, with an increase of 6.5 ft occurring at MW-8 in November 2019. Nearby well MW-76 (which has been periodically dry since its installation) also experienced an increase of approximately 3.5 ft in November 2019. The increase in water levels at these wells warrants further evaluation after measurements are collected during the first sampling event of 2020.

- MW-71, MW-72, and MW-73 (background wells for the URS and CWTP): Groundwater elevations in these wells have declined on the order of 0.5 ft from the initial measurements in 2017. In general, the overall declining trends in groundwater elevations at these wells appears to have continued throughout the reporting period.

- MW-74 (background well for Multiunit 1 and the DFADA): Groundwater elevations at this well (located downstream of Morgan Lake) varied by more than 3 ft over the duration of 2019 and are observed to fluctuate seasonally, with highest elevations in early spring and lowest elevations in late summer to late fall.

The significance of these exceptions will be evaluated as additional data are collected.

Figures 2-1 through 2-3 present potentiometric surface maps that are representative of conditions at the time of groundwater sampling in March/April 2019, May 2019, and November/December 2019, respectively. The potentiometric surface map for the November/December 2019 sampling round incorporates water levels from an expanded list of supplementary site wells, resulting in a refinement of the potentiometric surface to the north and downgradient of Multiunit 1 used to further evaluate corrective measures (see Section 3.3). The estimated direction and gradient of groundwater flow derived from collected groundwater elevation data are noted in the figures. As indicated, groundwater appears to flow towards Morgan Lake in

the plant area and towards Chaco Wash in the disposal area. North of Multiunit 1, groundwater appears to flow west towards Chaco Wash.

2.2.2 Groundwater Flow Rate Estimation

The CCR Rule requires that groundwater flow rates beneath CCR units be estimated during each monitoring event. To meet this requirement, water levels measured at the time of sampling were used to calculate the direction and magnitude of the hydraulic gradient in the vicinity of each unit using a spreadsheet tool available on the United States Environmental Protection Agency (USEPA) website (USEPA, 2014). Darcy's Equation for flow through porous media was then used with site data (where available) and/or literature-based hydraulic conductivity and effective porosity values for hydrogeologic units to estimate groundwater flow rates. Table 2-2 summarizes the results of these calculations.

For the Pictured Cliffs Sandstone underlying the URS and CWTP, the hydraulic gradient and flow direction were relatively consistent throughout the reporting period. The hydraulic gradient throughout the reporting period was comparable to the last monitoring round of 2018 but an order of magnitude lower than the gradient observed before the URS was replaced by the aboveground tank. The magnitude of the hydraulic gradient ranged from 0.0008 to 0.0009 ft per ft and the direction of groundwater flow was northwest towards Morgan Lake (322 to 325 degrees from north). Corresponding groundwater flow rates ranged from 0.02 ft to 0.04 per day.

For the Lewis Shale underlying Multiunit 1, the hydraulic gradient and flow direction were also relatively stable. The magnitude of the hydraulic gradient was 0.03 ft per ft during each monitored round and the direction of groundwater flow was southwest towards Chaco Wash (255 to 258 degrees from north). The corresponding groundwater flow rate was 0.0002 ft per day, which is comparable to rates indicated by 2018 data.

2.2.3 Sample Collection

APS collected, labeled, preserved, and shipped groundwater samples in accordance with the SAP. In some instances, the wells were assessed as dry upon monitoring or did not have enough water and could not be sampled (Table 2-1). In accordance with 40 CFR §257.93(i), collected groundwater samples were not field filtered prior to analysis. Pursuant to the SAP, quality control samples (i.e., field duplicates, field blanks and extra sample volume for matrix spike samples) were collected during each groundwater monitoring event. These samples are noted on associated chain-of-custody documentation.

2.2.4 Sample Analysis and Data Validation

APS submitted groundwater samples to TestAmerica Laboratories, Inc. (TestAmerica) and Radiation Safety Engineering, Inc. (Radiation Safety) located in Phoenix, Arizona for analysis. TestAmerica evaluated samples for all constituents other than radium. Radiation Safety performed radium analyses. Both TestAmerica and Radiation Safety are Arizona Department of Health Services-licensed laboratories (AZ0728 and AZ0462, respectively). Appendix C presents the associated Laboratory Reports of Analysis organized by CCR unit.

Table 2-1 identifies the analytes evaluated during each monitoring event. Analytes varied based on the monitoring program (i.e. detection vs. assessment monitoring) and the need for supplementary information

useful in evaluating alternative sources (Section 2.1.4). The SAP identifies Appendix III and Appendix IV constituents with associated analytical methods.

Following receipt of final laboratory reports of analysis, the reports and associated sample data collected during detection and assessment monitoring were evaluated for quality assurance purposes. The scope of the review was a USEPA Stage 2A validation. Appendix D presents the *2019 Data Validation Report* which documents these reviews.

2.2.5 Sample Results

Appendix C presents sample results in the Laboratory Reports of Analysis. The sampling coverage and frequency of the groundwater monitoring system is assumed representative and adequate of spatial and temporal heterogeneity until proven otherwise.

2.3 Statistical Analysis of Monitoring Data

During the reporting period, statistical analyses were conducted to evaluate whether collected monitoring data indicate site CCR units have adversely impacted underlying groundwater. Analyses were conducted in accordance with the site-specific SDAWP (Wood, 2018) and are summarized in the following sections.

2.3.1 Evaluation of Appendix III Constituent Data

Two units remained in detection monitoring as of the end of 2018: the CWTP and the DFADA. There were no groundwater samples collected from the DFADA groundwater monitoring system during the reporting period and thus no statistical analyses were performed using data collected from this unit.

On April 15, 2019, initial exceedances over background were declared for boron and calcium and SSI declarations were made for fluoride and pH at CWTP compliance wells (Appendix E). The declarations were based on data collected in November 2018. Given past (2017 and 2018) initial exceedances and SSI declarations for boron and calcium and fluoride and pH, respectively, APS conducted an ASD for boron, calcium, fluoride, and pH at the CWTP (Appendix A and Section 2.1.4). The ASD indicated that the exceedances could not definitively be attributed to a leak from the CWTP. Rather, the exceedances appear to be associated with spatially inconsistent groundwater chemistry caused by several factors, including past anthropogenic activities impacting subsurface conditions, surface-groundwater interactions, and natural spatial variability in groundwater quality conditions. The ASD recommended continuing with detection monitoring, updating the BTVs for boron and calcium, and performing intrawell statistical comparisons for pH and fluoride rather than interwell comparisons for select CWTP compliance wells.

On October 15, 2019, APS documented a statistical analysis of the detection monitoring data collected at the CWTP through May 2019 (Appendix F). The analysis addresses the recommendations presented in the ASD for the CWTP noted above and includes the updated BTVs summarized in Table 2-3. The statistical analysis concluded that there is sufficient evidence to declare initial exceedances for calcium at MW-62 and MW-63 and recommended evaluating the exceedance using the 1 of 2 resampling strategy in place for this constituent during the next scheduled monitoring event.

2.3.2 Evaluation of Appendix IV Constituent Data

No statistical evaluations of Appendix IV constituent data were necessary during the reporting period.

3.0 CORRECTIVE ACTION PROGRAM

Based on the declaration that one or more Appendix IV constituents are present at SSLs above GWPSs downgradient of Multiunit 1 and the URS, these units are currently in the corrective action program. Notification of the exceedances occurred on November 14, 2018 and were documented in the 2018 Annual Report (Wood, 2019).

A summary of corrective action program activities is presented in the following sections.

3.1 Characterization of Potential Releases from CCR Units

To characterize releases from CCR units, 40 CFR §257.95(g)(1) requires: (i) the installation of wells to define the extent of contaminant plumes, (ii) collection of data on the nature and estimated quantity of material released, (iii) installation of at least one well at the facility boundary in the direction of contaminant migration, and (iv) sampling of these wells to characterize the nature and extent of the release.

During the reporting period, activities conducted to address CCR Rule release characterization requirements downgradient of Multiunit 1 and the URS included:

- The collection of groundwater quality data throughout 2019 (Section 2.2);
- Completion of a *Well Installation and Hydrogeologic Investigation Report* (Appendix G) to document the 2018 installation of monitoring wells to meet the requirements of 40 CFR §257.95(g)(1); and
- Characterization of the nature and extent of the release from Multiunit 1 and the URS in the form of plume maps derived from the hydrogeologic investigation (Appendix G).

Findings from the characterization activities can be summarized as follows:

- Multiunit 1: Molybdenum and cobalt are present at concentrations above their respective GWPS in groundwater downgradient of Multiunit 1. The extent of the molybdenum release appears to be limited to the area directly downgradient of the LDWP (Figure 3-1), while the cobalt release extends no further than the Southern Intercept Trench (SIT) (Figure 3-2), indicating that the SIT is capturing sufficient concentrations of Appendix IV constituents in groundwater such that off-site concentrations are below the respective GWPSs.
- URS: Fluoride is present at concentrations above the GWPS in groundwater downgradient of the URS. The extent of the release is limited to roughly the footprint of the former unit (Figure 3-3).

3.2 Notification to Landowners of Groundwater Impacts

40 CFR §257.95(g)(2) requires owners/operators of CCR units to notify downgradient landowners or residents of any off-site migration of contamination from CCR units. As indicated above, no off-site impacts due to CCR releases have occurred and thus no property owner notifications were required.

3.3 Corrective Measures Assessment

After a declaration of exceedance of an Appendix IV constituent, an assessment of corrective measures to prevent further releases, remediate any releases, and restore the affected area to original conditions must be initiated per 40 CFR §257.96(a).

On February 13, 2019, APS placed a notification of the initiation of a CMA in the facility's operating record and to APS's CCR information webpage in accordance with 40 CFR §257.105(h)(9) and 40 CFR §257.106(h)(7) (Appendix H). On April 15, 2019, APS demonstrated the need for additional time to complete the CMA in accordance with 40 CFR §257.96(a) (Appendix I).

The CMA for Multiunit 1 and the URS was documented on June 14, 2019 and posted to APS's CCR information webpage in accordance with 40 CFR §257.105(h)(10) and 40 CFR §257.106(h)(8). The CMA evaluates the performance of several combined corrective measures to address the fluoride exceedances at the URS and the cobalt and molybdenum exceedances at Multiunit 1, which include:

- Demolition of the URS and replacement with a new concrete tank (the Upper Retention Tank [URT]) in the footprint of the former URS to perform the previous function of this process unit;
- Installation and operation of new containment wells to intercept impacted groundwater downgradient of the URS;
- Monitored natural attenuation of CCR constituents;
- Operation of an existing intercept trench system downgradient of Multiunit 1 to extract impacted groundwater prior to migration off-site; and
- Future dewatering of Multiunit 1 with subsequent closure.

3.4 Semiannual Progress Report on Remedy Selection for Multiunit 1 and the URS

40 CFR §257.97(a) requires the preparation of semiannual reports which document the progress of remedy selection for CCR units that have potentially impacted groundwater until the remedy is selected. Accordingly, APS prepared the first semiannual report during the reporting period on July 15, 2019 which describes the progress of remedy selection for Multiunit 1 and the URS. This semiannual report is included as Appendix J.

This Annual Groundwater Monitoring and Corrective Action Report for 2019 fulfills the requirements of 40 CFR §257.97(a) for a subsequent semiannual progress report by providing the following updates on remedy selection for Multiunit 1 and the URS:

- *Further Assessment of Groundwater Elevations in the Disposal Area*. As indicated in Section 2.2 of this report, an expanded list of supplementary wells were monitored for groundwater levels during the November/December 2019 monitoring round. These data suggest that the groundwater monitoring system should be expanded to evaluate select existing wells that provide additional information regarding the performance of seepage collection system;
- *Evaluation of Constituent of Concern Exceedances at MW-87*. Continuing monitoring conducted during the reporting period indicated that when water is present at MW-87, molybdenum and

cobalt concentrations are elevated. An investigation into surface water/groundwater interaction at MW-87 has been initiated to evaluate the potential connection between water quality in the Chaco Wash and groundwater quality at the monitoring well; and

- *Pre-Design Evaluation of a Potential URS Groundwater Containment System*. During the reporting period, suitable locations for potential containment system wells were selected and the test wells were installed (Section 2.1.1).

Future planned activities related to remedy selection for Multiunit 1 and the URS are documented in Section 4.0.

3.5 CCR Unit Closure Activities

The closure plan for the URS (AECOM, 2018) includes closure by removal of CCR solids, demolition and excavation of the URS, and construction of a new reinforced tank to replace the function of the URS. A notice of intent to initiate closure of the URS was published on December 10, 2018 and the activities described in the closure plan were documented in the 2018 Annual Report (Wood, 2019). Closure of the URS will not be complete until the concentrations of fluoride in groundwater downgradient of the unit decline to less than the GWPS for this constituent per 40 CFR §257.102(c).

In accordance with 40 CFR §257.101(a)(1) for Multiunit 1 (an unlined surface impoundment with one or more declared GWPS exceedances) and 40 CFR §257.101(b)(1) for the CWTP (a surface impoundment that has not demonstrated compliance with the location standard), APS will cease placing CCR and non-CCR wastestreams in these units by October 31, 2020 (pending rule revision) and initiate closure of the unit in accordance with 40 CFR §257.102. Various modifications will be required to remove these units from plant operations including:

- Installation and commissioning of unit processes to enable blending of FGD waste with fly ash for disposal in the DFADA;
- Construction and commissioning of a new Bottom Ash Sluice Water sedimentation tank system to replace the function of the CWTP; and
- Commissioning of the new RWP to temporarily store FGD waste and leachate from the disposal area seepage intercept system that previously discharged into the LDWP of Multiunit 1.

Progress implementing these modifications was ongoing as of the end of 2019.

4.0 KEY ACTIVITIES FOR UPCOMING YEAR

During 2020, the following key activities will likely be conducted to support CCR groundwater monitoring and corrective action compliance at the site:

- Preparation of an Annual Groundwater Monitoring and Corrective Action Report for 2020 – Per 40 CFR §257.90(e), an annual report must be prepared no later than January 31 of the year following the calendar year documented in the report.

- Continued Detection Monitoring at the CWTP and DFADA with Evaluation for SSIs – Per 40 CFR §257.94(b), detection monitoring (including analysis of collected samples for Appendix III constituents) must continue on a semiannual basis. On an ongoing basis, APS must determine whether there has been an SSI over background at the CCR units undergoing detection monitoring within 90 days of sampling and analysis (40 CFR §257.93[h][2]).

- Initiation of Assessment Monitoring for CCR Units with an SSI over Background (as applicable) – Per 40 CFR §257.94(e)(1), within 90 days of detecting an SSI over background levels for any Appendix III constituent, an assessment monitoring program must be established.

- Continued Assessment Monitoring at Multiunit 1 and the URS – While corrective action evaluation progresses, assessment monitoring (including analysis of collected samples for Appendix III and Appendix IV constituents) must be conducted on a semiannual basis per 40 CFR §257.95(b) and (d)(1).

- Public Meeting – Per 40 CFR §257.96(e), APS will conduct a public meeting with interested and affected parties to present the results of the CMA for Multiunit 1 and the URS at least 30 days prior to selecting remedies for each CCR unit.

- Remedy Selection – APS will select remedies for Multiunit 1 and the URS that meet the requirements of 40 CFR §257.97(b). Additionally, APS will prepare a remedy selection report for each unit per 40 CFR §257.97(a).

- Initiation of Remedial Activities – Per 40 CFR §257.91(f), APS will begin remedial activities at Multiunit 1 and the URS within 90 days of selecting a remedy for each unit.

- Initiation of Closure Activities at Multiunit 1 and the CWTP – CCR discharges to Multiunit 1 and the CWTP will cease during 2020. Following notification of the initiation of closure at these units, closure activities are anticipated to begin in accordance with the individual unit closure plans.

- Groundwater Monitoring at the RWP – Per 40 CFR §257.94(b), the groundwater monitoring system installed downgradient of the RWP during the reporting period will be certified in 2020. Other activities to be completed during 2020 include updates to the SAP and the SDAWP with continuation of detection monitoring at the RWP wells per 40 CFR §257.91(f).

- Assessment of Appendix IV Exceedances at MW-87 – CCR well MW-87, which is downgradient of Multiunit 1, has shown exceedances of Appendix IV constituents at SSLs when water is present in the well. To assess these exceedances, APS will conduct an analysis during 2020 which will evaluate whether potential surface water impacts associated with intermittent flow in Chaco Wash are affecting concentrations of Appendix IV constituents in groundwater at MW-87.

Since the CCR Rule is implemented in phases based on analysis of data collected during the groundwater monitoring program, the foregoing list only includes reasonably probable activities that will occur in 2020; this list is not comprehensive.

5.0 REFERENCES

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TABLES

Table 1-1
Description of Coal Combustion Residual Units

CCR Unit	Location	Function	Operation	Size/Construction	History
Upper Retention Sump (URS)	*Plant Area* NW1/4 of Section 36, T29N, R16W	*Single CCR unit* . Impoundment. Surge pond for FGD system.	Historically, FGD system discharge was discharged into the URS via 10 plus controlled/monitored lines. Pond contents were recirculated back into the FGD process via a pump chamber located on the south end of the pond. Solids were periodically removed from the sump.	- 1.07 acres in areal extent - Soil-cement liner on bottom and inside slopes	Placed in service around 1983. Pond demolshed in 2018 and replaced with an above-ground concrete tank in the footprint of the former URS.
Combined Waste Treatment Pond (CWTP)	*East of Plant, Adjacent to Morgan Lake* SE1/4 of Section 25, T29N, R16W	*Single CCR Unit* . Impoundment. Detention pond used as a settling and stabilization basin for ash-impacted and other Plant wastewater flows prior to discharge to Morgan Lake in accordance with an NPDES permit.	The primary source of water to the CWTP is from hydrobins which separate transport water from bottom ash generated in plant Units 4 and 5. Seven earthen basins in the western edge of the CWTP promote sediment settling prior to the water decanting into the main portion of the CWTP and then overflowing into the cooling water discharge canal at the northeast corner of the pond.	- 13.7 acres in areal extent	Constructed in 1978.
Lined Ash Impoundment (LAI)	*Disposal Area* E1/2 of Section 34, T29N, R16W	*Part of a CCR multiunit with the LDWP* that receives fly ash, flue gas desulfurization (FGD) waste and associated residuals as a slurry from the plant. Impoundment.	Waste is discharged into the pond in the northeast portion of the pond. Decanted flow discharges via a vertical drop structure through a toe drain into the LDWP.	- 75 acres in areal extent - 60 mil HDPE liner - 5,364 acre-ft design capacity - 5,275.2 ft AMSL maximum working level	Constructed on top of closed Ash Ponds 4 and 5 and placed in service in 2004.
Lined Decant Water Pond (LDWP)	*Disposal Area* E1/2 of Section 34, T29N, R16W	*Part of a CCR multiunit with the LAI* that receives decanted water from the LAI. Impoundment.	Decanted water is discharged into the LAI via gravity; the water is pumped from the LDWP back to the plant for reuse in operations.	- 45 acres in areal extent - Two 60 mil HDPE liners separated by a leak detection layer - 435 acre-ft design capacity - 5,213.2 ft AMSL maximum working level	Constructed on top of closed Ash Pond 3 and placed in service in 2003.
Dry Fly Ash Disposal Area (DFADA)	*Disposal Area* SE1/4 of Section 34, T29N, R16W	*Single CCR unit* . Landfill. Disposal of dry fly ash, bottom ash, and construction debris. In the future, FGD solids will be mixed with fly ash at the plant and landfilled in the DFADA.	The DFADA is filled in general accordance with a stacking plan. Leachate generated from the DFADA cells is pumped into trucks and used for dust control or can be transferred to the LDWP.	- 3 conjoined cells (DFADA 1, 2, and 3) with areal extents of 37 acres, 32 acres, and 15 acres, respectively - 3,125 acre-ft design capacity - DFADA 1: compacted clay overlain by 60 mil HDPE liner and drainage layer - DFADA 2 and 3: geosynthetic clay liner overlain by 60 mil HDPE liner and drainage layer - Leachate collection system drains each DFADA cell - DFADA 4 is planned but not yet constructed	Constructed in 2007 (DFADA 1), 2012 (DFADA 2), and 2014 (DFADA 3).

Notes:

AMSL - above mean sea level
CCR - Coal combustion residuals
CWTP - Combined Waste Treatment Pond
DFADA - Dry Fly Ash Disposal Area
FGD - flue gas desulfurization
ft - feet
HDPE - high density polyethylene
LAI - Lined Ash Impoundment
LDWP - Lined Decant Water Pond
NPDES - National Pollutant Discharge Elimination System
URS - Upper Retention Sump

Table 1-2
CCR Groundwater Monitoring System Summary

Well	CCR Unit	Well Designation	Hydrogeologic Unit	Date Installed	Borehole Depth [ft bgs]	Top of Casing Elevation [ft AMSL]	Ground Surface Elevation [ft AMSL]	Top of Screen [ft bgs]	Bottom of Screen [ft bgs]	Screen Length [ft]	Top Screen Elevation [ft AMSL]	Bottom Screen Elevation [ft AMSL]	Bottom Borehole Elevation [ft AMSL]
MW-12R1	DFADA	Background	Lewis Shale	4/10/2018	40	5,270.12	5,268.23	22	32	10	5,246.20	5,236.20	5,228.23
MW-55R	DFADA	Background	Lewis Shale	9/13/2015	95	5,243.96	5,241.36	72.9	92.9	20	5,168.46	5,148.46	5,146.36
MW-10	DFADA	Downgradient	Lewis Shale	3/12/1987	35	5,150.71	5,149.65	13.0	33.0	20	5,136.65	5,116.65	5,114.65
MW-13	DFADA	Downgradient	Lewis Shale	8/31/1987	60	5,150.75	5,149.52	34.9	54.9	20	5,114.62	5,094.62	5,089.52
MW-44	DFADA	Downgradient	Lewis Shale	3/28/2012	40	5,146.89	5,145.15	13.5	23.5	10	5,131.65	5,121.65	5,105.15
MW-48	DFADA	Downgradient	Lewis Shale	5/14/2013	60	5,165.96	5,163.43	35.0	60.0	25	5,128.43	5,103.43	5,103.43
MW-11	DFADA	Supplementary	Lewis Shale	3/13/1987	49.9	5,111.96	5,110.48	29.9	49.9	20	5,080.58	5,060.58	5,060.58
MW-43	Multiunit 1	Background	Lewis Shale	3/24/2012	60	5,271.58	5,269.42	16.0	26.0	10	5,253.42	5,243.42	5,209.42
MW-49A	Multiunit 1	Background	Lewis Shale	5/18/2013	68	5,288.62[(b)]	5,285.29[(b)]	50.0	65.0	15	5,231.38	5,216.38	5,213.38
MW-50A	Multiunit 1	Background	Lewis Shale	5/7/2013	63	5,335.67	5,333.20	28.0	43.0	15	5,305.20	5,290.20	5,270.20
MW-51	Multiunit 1	Background	Lewis Shale	4/28/2013	80	5,288.14	5,285.14	20.0	30.0	10	5,265.14	5,255.14	5,205.14
MW-74	Multiunit 1	Background	Lewis Shale	1/18/2017	40	5,219.09	5,216.70	8.1	18.1	10	5,208.60	5,198.60	5,176.70
MW-07	Multiunit 1	Downgradient	Lewis Shale	3/11/1987[(a)]	60	5,149.32	5,148.29	14.7	34.7	20	5,133.59	5,113.59	5,088.29
MW-08	Multiunit 1	Downgradient	Lewis Shale	3/11/1987[(a)]	74	5,122.56	5,120.85	27.7	47.7	20	5,093.15	5,073.15	5,046.85
MW-40R	Multiunit 1	Downgradient	Lewis Shale	9/17/2015	25	5,137.43	5,134.83	14.3	24.3	10	5,120.53	5,110.53	5,109.83
MW-61	Multiunit 1	Downgradient	Lewis Shale	9/16/2015	35	5,129.19	5,126.59	24.2	34.2	10	5,102.39	5,092.39	5,091.59
MW-75	Multiunit 1	Downgradient	Lewis Shale	3/15/2017	41	5,126.80	5,124.80	29.0	39.0	10	5,095.80	5,085.80	5,083.80
MW-76	Multiunit 1	Downgradient	Lewis Shale	3/16/2017	33	5,116.23	5,114.30	11.8	26.8	15	5,102.50	5,087.50	5,081.30
MW-87	Multiunit 1	Downgradient	Lewis Shale	11/28/2018	50	5,076.53	5,074.29	15.0	45.0	30	5,059.29	5,029.29	5,024.29
DMX-03	Multiunit 1	Supplementary	Lewis Shale	4/14/1992	38	5,085.50	5,084.85	18.0	38.0	20	5,066.85	5,046.85	5,046.85
DMX-04	Multiunit 1	Supplementary	Lewis Shale	4/15/1992	51	5,073.00	5,072.11	31.0	51.0	20	5,041.11	5,021.11	5,021.11
DMX-06	Multiunit 1	Supplementary	Lewis Shale	4/16/1992	35	5,077.40	5,076.42	15.0	35.0	20	5,061.42	5,041.42	5,041.42
MW-05	Multiunit 1	Supplementary	Lewis Shale	3/12/1987	49.1	5,088.50	5,087.31	29.1	49.1	20	5,058.21	5,038.21	5,038.21
MW-06	Multiunit 1	Supplementary	Lewis Shale	3/12/1987	48.8	5082.71	5,080.19	28.8	48.8	20	5,051.39	5,031.39	5,031.39
MW-15	Multiunit 1	Supplementary	Lewis Shale	9/1/1987	52.7	5,093.93	5,092.28	22.2	52.2	30	5,070.08	5,040.08	5,039.58
MW-16	Multiunit 1	Supplementary	Lewis Shale	9/2/1987	54.8	5,101.32	5,100.42	35.5	54.8	19	5,064.92	5,045.62	5,045.62
MW-17R	Multiunit 1	Supplementary	Lewis Shale	December 2013	32	5,093.09	5,090.43	16.5	31.5	15	5,073.93	5,058.93	5,058.43
MW-18	Multiunit 1	Supplementary	Lewis Shale	9/3/1987	55	5,089.10	5,088.06	25.5	55.0	30	5,062.56	5,033.06	5,033.06
MW-23R	Multiunit 1	Supplementary	Lewis Shale	12/6/2013	41.5	5,101.53	5,099.08	21.0	41.0	20	5,078.08	5,058.08	5,057.58
MW-24	Multiunit 1	Supplementary	Lewis Shale	9/05/1987	69.7	5,081.65	5,080.41	59.7	69.7	10	5,020.71	5,010.71	5,010.71
MW-36R	Multiunit 1	Supplementary	Lewis Shale	December 2013	34	5,093.33	5,090.76	13.5	33.5	20	5,077.26	5,057.26	5,056.76
MW-38R	Multiunit 1	Supplementary	Lewis Shale	December 2013	39	5,094.12	5,091.41	13.5	38.5	25	5,077.91	5,052.91	5,052.41
MW-45	Multiunit 1	Supplementary	Lewis Shale	May 2013	39	5,089.56	5,087.13	24.0	39.0	15	5,063.13	5,048.13	5,048.13
MW-46	Multiunit 1	Supplementary	Lewis Shale	May 2013	26	5,064.30	5,061.91	16.0	26.0	10	5,045.91	5,035.91	5,035.91
MW-52	Multiunit 1	Supplementary	Lewis Shale	May 2013	82	5,210.41	5,208.06	67.0	82.0	15	5,141.06	5,126.06	5,126.06
MW-54	Multiunit 1	Supplementary	Lewis Shale	5/20/2013	91	5,217.82	5,218.38	76.0	91.0	15	5,142.38	5,127.38	5,127.38
MW-56	Multiunit 1	Supplementary	Lewis Shale	December 2013	36.5	5,091.49	5,089.14	26.0	36.0	10	5,063.14	5,053.14	5,052.64
MW-57	Multiunit 1	Supplementary	Lewis Shale	December 2013	42.5	5,088.30	5,085.70	22.0	42.0	20	5,063.70	5,043.70	5,043.20
MW-60	Multiunit 1	Supplementary	Lewis Shale	9/16/2015	25	5144.1	5141.5	14.3	24.3	10	5,127.16	5,117	5,116.50
MW-71	URS/CWTP	Background	Pictured Cliffs Sandstone	3/1/2016	50	5,362.91	5,363.62	22.5	42.5	20	5,341.12	5,321.12	5,313.62
MW-72	URS/CWTP	Background	Pictured Cliffs Sandstone	3/2/2016	61	5,381.62	5,379.09	50.7	60.7	10	5,328.39	5,318.39	5,318.09
MW-73	URS/CWTP	Background	Pictured Cliffs Sandstone	1/18/2017	45	5,353.95	5,351.90	28.9	43.9	15	5,323.00	5,308.00	5,306.90
MW-62	CWTP	Downgradient	Pictured Cliffs Sandstone	9/28/2015	20	5,341.87	5,339.37	10.0	20.0	10	5,329.37	5,319.37	5,319.37
MW-63	CWTP	Downgradient	Pictured Cliffs Sandstone	9/25/2015	20	5,337.02	5,337.02	9.0	19.0	10	5,328.02	5,318.02	5,317.02
MW-64	CWTP	Downgradient	Pictured Cliffs Sandstone	9/26/2015	25	5,337.66	5,337.66	10.0	20.0	10	5,327.66	5,317.66	5,312.66

Table 1-2
CCR Groundwater Monitoring System Summary

Well	CCR Unit	Well Designation	Hydrogeologic Unit	Date Installed	Borehole Depth [ft bgs]	Top of Casing Elevation [ft AMSL]	Ground Surface Elevation [ft AMSL]	Top of Screen [ft bgs]	Bottom of Screen [ft bgs]	Screen Length [ft]	Top Screen Elevation [ft AMSL]	Bottom Screen Elevation [ft AMSL]	Bottom Borehole Elevation [ft AMSL]
MW-65	CWTP	Downgradient	Pictured Cliffs Sandstone	9/27/2015	20	5,339.74	5,337.24	8.0	18.0	10	5,329.24	5,319.24	5,317.24
MW-66	URS	Downgradient	Pictured Cliffs Sandstone	9/27/2015	33	5,344.69	5,344.70	15.0	25.0	10	5,329.70	5,319.70	5,311.70
MW-67	URS	Downgradient	Pictured Cliffs Sandstone	9/11/2015	31	5,352.76[(b)]	5,353.8[(b)]	19.6	29.6	10	5,334.42	5,324.42	5,323.02
MW-68	URS	Downgradient	Pictured Cliffs Sandstone	9/10/2015	30	5,353.58	5,353.95	19.0	29.0	10	5,334.95	5,324.95	5,323.95
MW-69	URS	Downgradient	Pictured Cliffs Sandstone	9/9/2015	35	5,357.66	5,355.26	24.3	34.3	10	5,330.96	5,320.96	5,320.26
MW-70	URS	Downgradient	Pictured Cliffs Sandstone	9/30/2015	53	5,371.12	5,368.62	40.0	50.0	10	5,328.62	5,318.62	5,315.62
MW-83	URS	Downgradient	Pictured Cliffs Sandstone	11/29/2018	35	5,343.15	5,341.51	14.0	29.0	15	5,327.51	5,312.51	5,306.51
MW-84	URS	Downgradient	Pictured Cliffs Sandstone	11/18/2018	35	5,338.23	5,339.34	10.0	30.0	20	5,329.34	5,309.34	5,304.34
MW-85	URS	Downgradient	Pictured Cliffs Sandstone	11/18/2018	35	5,352.78	5,353.69	15.0	30.0	15	5,338.69	5,323.69	5,318.69
MW-86	URS	Downgradient	Pictured Cliffs Sandstone	11/17/2018	35	5,338.76	5,338.74	10.0	30.0	20	5,328.74	5,308.74	5,303.74
DMX-01	Other Disposal Areas	Supplementary	Lewis Shale	4/15/1992	39	5,098.02	5,097.49	19.0	39.0	20	5,078.49	5,058.49	5,058.49
IP-01	Other Disposal Areas	Supplementary	Lewis Shale	December 2013	38.5	5,101.81	5,099.39	13.5	38.5	20	5,085.89	5,060.89	5,060.89
IP-02	Other Disposal Areas	Supplementary	Lewis Shale	December 2013	27.5	5,090.79	5,088.27	17.0	27.0	10	5,071.27	5,061.27	5,060.77
IP-03	Other Disposal Areas	Supplementary	Lewis Shale	December 2013	34.5	5,091.08	5,088.68	24.0	34.0	10	5,064.68	5,054.68	5,054.18
IP-04	Other Disposal Areas	Supplementary	Lewis Shale	December 2013	32.5	5,095.92	5,093.46	22.0	32.0	10	5,071.46	5,061.46	5,060.96
IP-05	Other Disposal Areas	Supplementary	Lewis Shale	December 2013	41	5,094.43	5,091.88	20.5	40.5	20	5,071.38	5,051.38	5,050.88
MW-01	Other Disposal Areas	Supplementary	Lewis Shale	9/06/1987	21.6	5,140.43	5,138.48	11.6	21.6	10	5,126.88	5,116.88	5,116.88
MW-03	Other Disposal Areas	Supplementary	Lewis Shale	3/13/1987	44.25	5,126.73	5,125.52	14.3	44.3	30	5,111.27	5,081.27	5,081.27
MW-19	Other Disposal Areas	Supplementary	Lewis Shale	9/3/1987	49.7	5,127.40	5,126.34	29.2	49.7	21	5,097.14	5,076.64	5,076.64
MW-21	Other Disposal Areas	Supplementary	Lewis Shale	9/4/1987	30	5,155.04	5,154.47	10.6	30.0	19	5,143.87	5,124.47	5,124.47
MW-22	Other Disposal Areas	Supplementary	Lewis Shale	9/4/1987	30.4	5,156.51	5,156.30	10.4	30.4	20	5,145.90	5,125.90	5,125.90
MW-26	Other Disposal Areas	Supplementary	Lewis Shale	9/06/1987	50.5	5,139.26	5,138.36	40.5	50.5	10	5,097.86	5,087.86	5,087.86
MW-30	Other Disposal Areas	Supplementary	Lewis Shale	6/7/2010	23	5,091.67	5,092.06	13.0	23.0	10	5,079.06	5,069.06	5,069.06
MW-31	Other Disposal Areas	Supplementary	Lewis Shale	6/7/2010	24	5,092.59	5,089.96	14.0	24.0	10	5,075.96	5,065.96	5,065.96
MW-32	Other Disposal Areas	Supplementary	Lewis Shale	6/7/2010	20	5,087.65	5,084.94	10.0	20.0	10	5,074.94	5,064.94	5,064.94
MW-77S	Other Disposal Areas	Supplementary	Lewis Shale	11/8/2018	80	5094.94	5092.35	24.0	44.0	20	5,068.35	5,048.35	5,012.35
MW-78S	Other Disposal Areas	Supplementary	Lewis Shale	11/13/2018	80	5,088.79	5,086.51	24.0	44.0	20	5,062.51	5,042.51	5,006.51
MW-79S	Other Disposal Areas	Supplementary	Lewis Shale	11/20/2018	58	5,086.90	5,084.35	16.0	36.0	20	5,068.35	5,048.35	5,026.35
MW-80S	Other Disposal Areas	Supplementary	Lewis Shale	11/16/2018	81	5,086.80	5,084.29	35.0	55.0	20	5,049.29	5,029.29	5,003.29
MW-81	Other Disposal Areas	Supplementary	Lewis Shale	11/26/2018	36	5,086.41	5,084.07	13.0	33.0	20	5,071.07	5,051.07	5,048.07
MW-82S	Other Disposal Areas	Supplementary	Lewis Shale	11/27/2018	65	5,093.37	5,091.02	17.0	37.0	20	5,074.02	5,054.02	5,026.02

Notes:

Source of presented information presented is AECOM, 2017 and Sakura Engineering & Surveying, 2017 and 2019

Vertical datum is NAVD 88

[(a)] - Estimated

[(b)] - New surveyed elevation after wellhead modifications

AMSL - Above mean sea level
bgs - below ground surface
CCR - coal combustion residual(s)
CWTP - Combined Waste Treatment Pond
DFADA - Dry Fly Ash Disposal Area
ft - feet
URS - Upper Retention Sump

Table 2-1
CCR Groundwater Monitoring Event Summary for 2019

CCR UNIT	Well ID	Monitoring System Well Type	Sample Date (Monitoring Program)						Number of Field Original Samples Collected in 2019[c]
			Mar 16-20 and April 2, 2019 (Assessment)	Apr 1, 2019 (ASD)	May 6-7, 2019 (Detection)	May 6-14, 2019 (Assessment)	Dec 3, 2019 (Detection)	Nov 18-19 & Dec 2-3, 2019 (Assessment)	
CWTP	MW-62	CCR	---	X	X	---	X	---	3
	MW-63	CCR	---	X	X	---	X	---	3
	MW-64	CCR	---	X	X	---	X	---	3
	MW-65	CCR	---	X	X	---	X	---	3
DFADA	MW-10	CCR	---	---	---[b]	---	Dry	---	0
	MW-12R	CCR	---	---	Abandoned	---	Abandoned	---	0
	MW-12R1	CCR	---	---	---[b]	---	NS	---	0
	MW-13	CCR	---	---	---[b]	---	Dry	---	0
	MW-44	CCR	---	---	---[b]	---	NS	---	0
	MW-48	CCR	---	---	---[b]	---	Dry	---	0
	MW-55R	CCR	---	---	---[b]	---	NS	---	0
Multiunit 1	MW-6	Supplementary	X	---	---	X	---	X	3
	MW-7	CCR	X	---	---	X	---	X	3
	MW-8	CCR	X	---	---	X	---	X	3
	MW-15	Supplementary	X	---	---	X	---	X	3
	MW-16	Supplementary	X	---	---	X	---	X	3
	MW-17R	Supplementary	X	---	---	X	---	X	3
	MW-38R	Supplementary	X	---	---	X	---	X	3
	MW-40R	CCR	NS	---	---	---[b]	---	NS	0
	MW-43	CCR	Dry	---	---	---[b]	---	Dry	0
	MW-49A	CCR	X	---	---	X	---	X	3
	MW-50A	CCR	NS	---	---	---[b]	---	NS	0
	MW-51	CCR	Dry	---	---	---[b]	---	Dry	0
	MW-56	Supplementary	X	---	---	X	---	X	3
	MW-57	Supplementary	X	---	---	X	---	X	3
	MW-61	CCR	X	---	---	X	---	X	3
	MW-74	CCR	X	---	---	X	---	NS	2
	MW-75	CCR	X	---	---	X	---	X	3
	MW-76	CCR	NS	---	---	---[b]	---	NS	0
	MW-87	CCR	X	---	---	X	---	X	3
	DMX-4	Supplementary	X	---	---	X	---	X	3
	DMX-6	Supplementary	X	---	---	X	---	X	3
URS	MW-66	CCR	X	---	---	X	---	X	3
	MW-67	CCR	X	---	---	X	---	X	3
	MW-68	CCR	X	---	---	X	---	X	3
	MW-69	CCR	X	---	---	X	---	X	3
	MW-70	CCR	X	---	---	X	---	X	3
	MW-71[a]	CCR	X	---	---	X	---	X	3
	MW-72[a]	CCR	X	---	---	X	---	X	3
	MW-73[a]	CCR	X	---	---	X	---	X	3
	MW-83	CCR	X	---	---	X	---	X	3
	MW-84	CCR	X	---	---	X	---	X	3
	MW-85	CCR	X	---	---	X	---	X	3
	MW-86	CCR	X	---	---	X	---	X	3
Analyzed Constituents			*App IV*	*App III, App IV, and Supplementary Parameters*	*App III*	*App III and Detected App IV*	*App III*	*App III and App IV*	95

Notes:

[a] Background wells for both the CWTP and URS.
[b] Well scheduled for monitoring but not monitored.
[c] Totals exclude field duplicate samples.

X - Well Monitored
NS - Not Enough Water to Sample
--- - Well Not Monitored

App - Appendix
ASD - Alternative Source Demostration
CCR - coal combustion residuals

CWTP - Combined Waste Treatment Pond
DFADA - Dry Fly Ash Disposal Area
ID - Identification

URS - Upper Retention Sump

Table 2-2
Aquifer Properties and Groundwater Flow Calculations

Hydrogeologic Unit (CCR Unit)	Estimated Hydraulic Conductivity [ft/d]	Estimated Effective Porosity [Vol/Vol]	Sampling Event	Calculated Hydraulic Gradient [ft/ft]	Calculated Groundwater Flow Direction [degrees from North]	Estimated Groundwater Flow Rate [ft/d]
Pictured Cliffs Sandstone (URS and CWTP)	6.0[a]	0.25[b]	March/April 2019	0.0008	324	0.04
			May 2019	0.0009	325	0.02
			November/December 2019	0.0008	322	0.02
Lewis Shale (Multiunit 1)	0.00028[b]	0.05[b]	March/April 2019	0.03	257	0.0002
			May 2019	0.03	258	0.0002
			November/December 2019	0.03	255	0.0002

Notes:

CCR - Coal Combustion Residuals

CWTP - Combined Waste Treatment Pond

d - day

ft - feet

URS - Upper Retention Sump

Vol/Vol - volume per volume

References:

[a] AECOM, 2017

[b] Freeze, R.A. and Cherry, J.A., 1979.

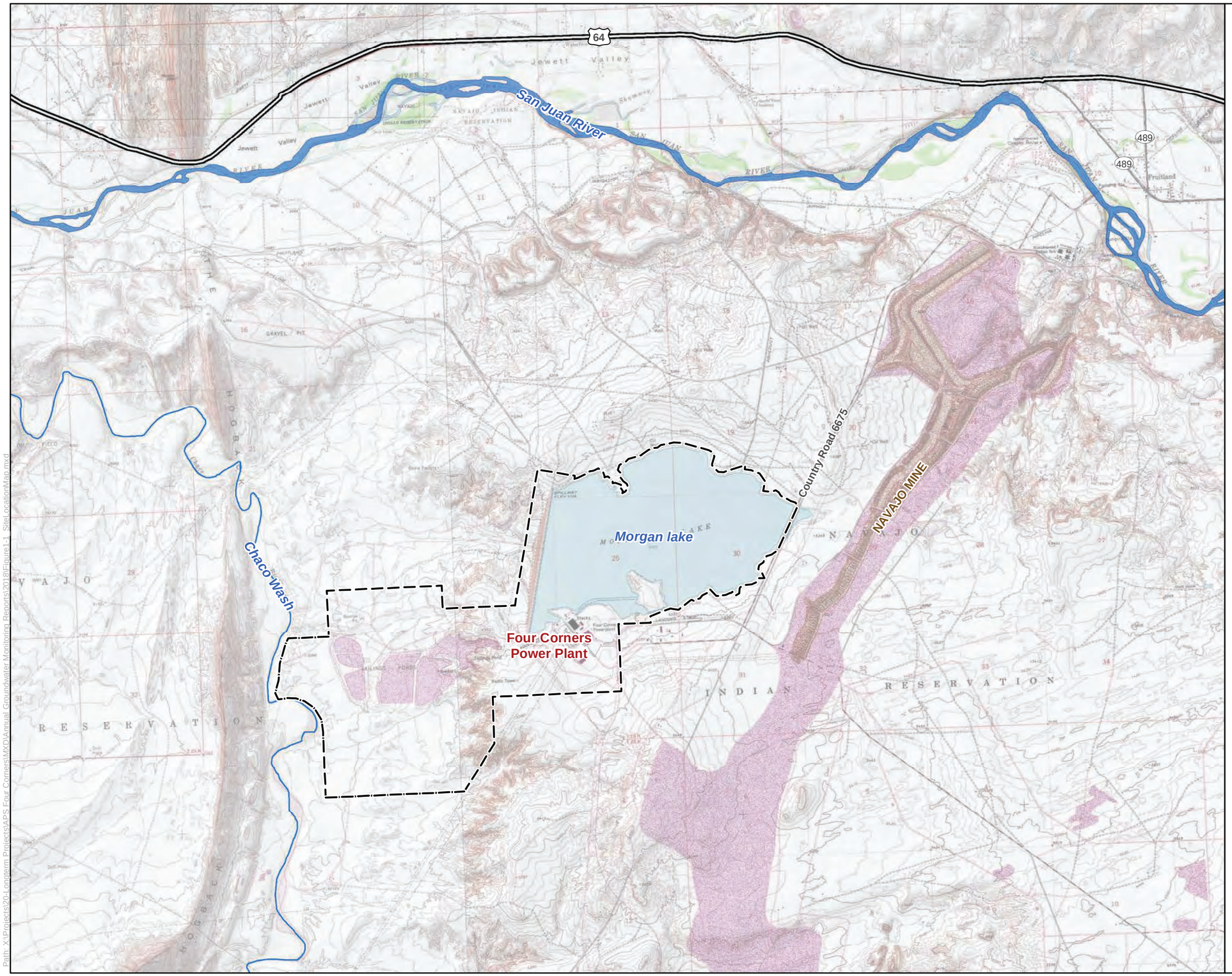
Table 2-3
Summary of Appendix III Constituent Statistical Analyses

CWTP			
Constituent	**Initial BTV (Applicable to All CWTP Compliance Wells)**	**Revised BTV (Applicable to Select CWTP Compliance Wells)**	**Corresponding Compliance Well(s)**
Boron	1.9 mg/L	2.0 mg/L	MW-62, MW-63
		0.69 mg/L	MW-64, MW-65
Calcium	540 mg/L	525 mg/L	All Wells
Chloride	710 mg/L	710 mg/L	All Wells
Fluoride	Detectable Concentrations Exceeding RL per the DQR	1.6 mg/L	MW-62*, MW-63*
		2.3 mg/L	MW-63
		1.5 mg/L	MW-64*
		2.0 mg/L	MW-65*
pH	Time Regression LPL and UPL	6.33 - 7.04 SU	MW-62, MW-63
		7.25 - 7.68 SU	MW-64*
		6.96 - 8.27 SU	MW-65*
Sulfate	13,000 mg/L	13,000 mg/L	All Wells
TDS	20,000 mg/L	20,000 mg/L	All Wells

Notes:

* - Intrawell statistical comparison performed
BTV - Background Threshold Value
CWTP - Combined Waste Treatment Plant
DQR - Double Quantification Rule
LPL - lower prediction limit
mg/L - milligrams per liter
RL - reporting limit
SU - Standard Units
TDS - total dissolved solids
UPL - upper prediction limit

FIGURES





Area of Detail

Legend

Four Corners Power Plant Lease Boundary

0 0.4 0.8 Miles

N

Arizona Public Service
Four Corners Power Plant
Fruitland, New Mexico

FIGURE **1-1**

Site Location Map

Job No.	14-2019-2017
PM:	EHL
Date:	1/31/2020
Scale:	1"= 0.8 miles

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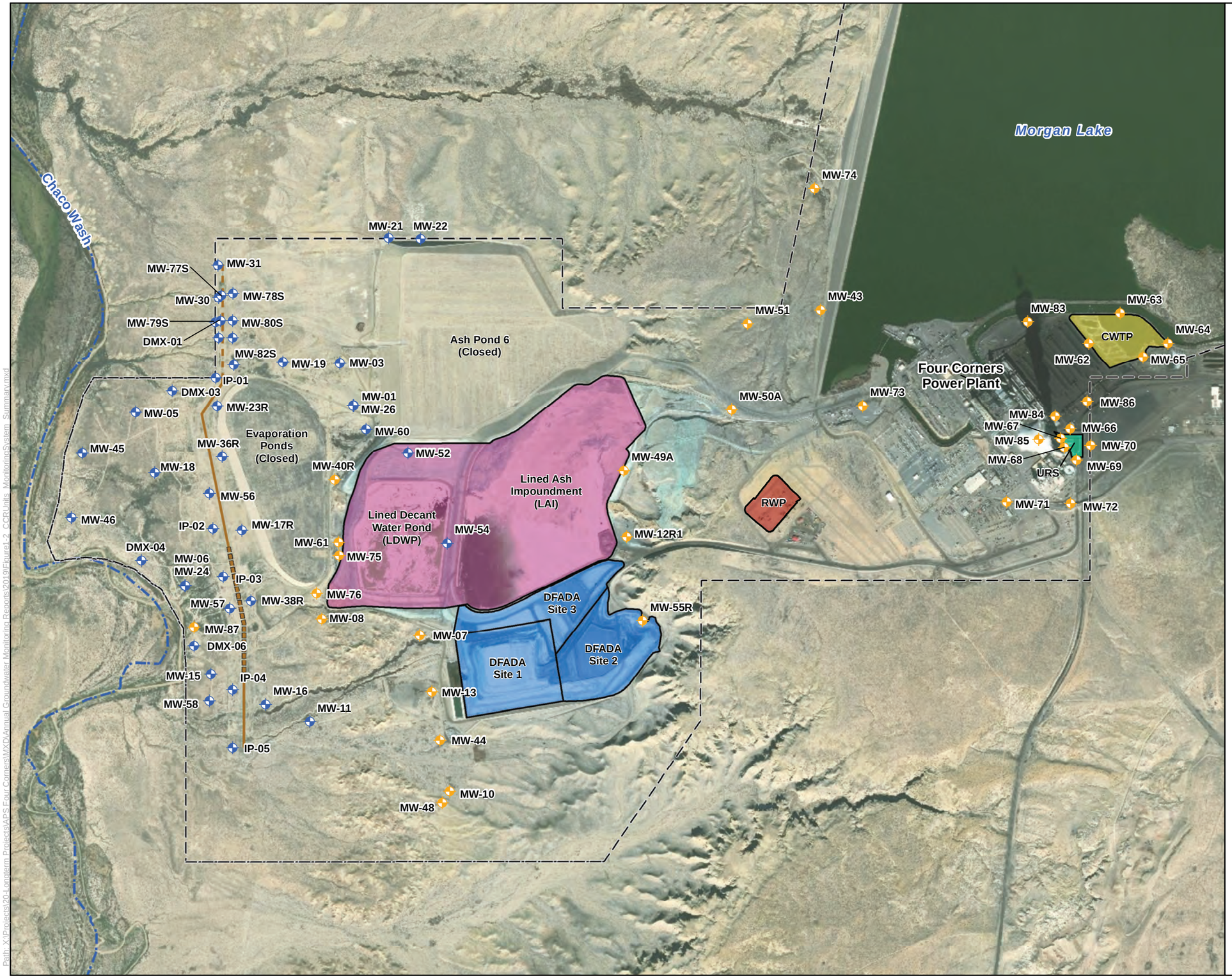

Legend

- CCR Monitoring Well Location
- Supplementary Site Monitoring Well Location
- FCPP Lease Boundary
- North Intercept Trench
- South Intercept Trench
- Approximate Extent of High Flow Zone
- Ephemeral Surface Water Feature

CCR Units

- Multiunit 1(LAI and LDWP)
- Dry Fly Ash Disposal Area (DFADA)
- Combined Waste Treatment Pond (CWTP)
- Upper Retention Sump (URS)
- Return Water Pond (RWP)

Notes:

CCR	Coal Combustion Residuals
CWTP	Combined Waste Treatment Pond
DFADA	Dry Fly Ash Disposal Area
FCPP	Four Corners Power Plant
LAI	Lined Ash Impoundment
LDWP	Lined Decant Water Pond
URS	Upper Retention Sump
RWP	Return Water Pond

0 350 700 1,400
Feet

N

Arizona Public Service
Four Corners Power Plant
Fruitland, New Mexico

FIGURE **1-2**

CCR Units and Monitoring System Summary

Job No.	14-2019-2017
PM:	EHL
Date:	1/31/2020
Scale:	1" = 1400'

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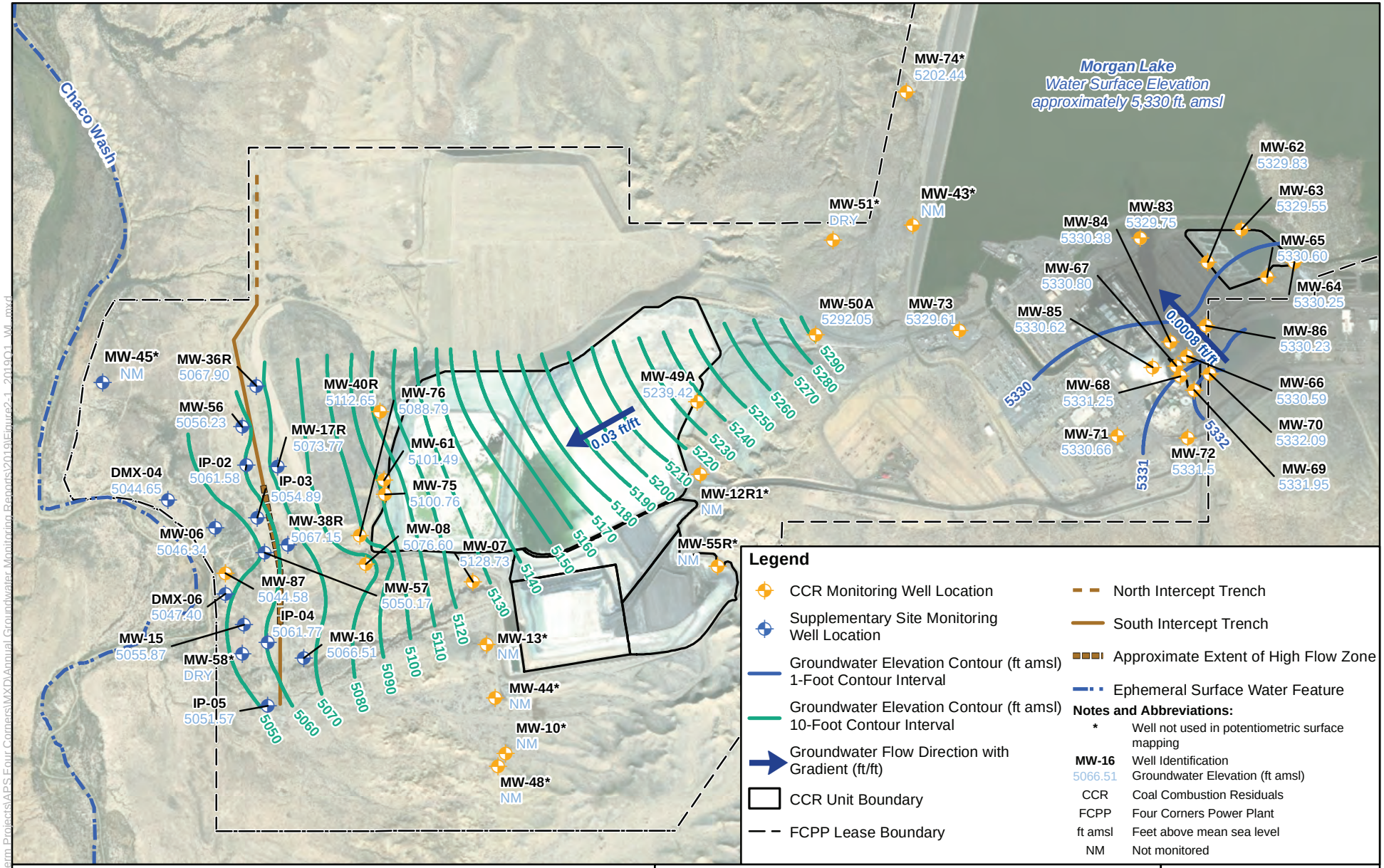

0 1,800 3,600 Feet

Job No.	14-2019-2017
PM:	EHL
Date:	1/31/2020
Scale:	1" = 1800'

N

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Arizona Public Service
Four Corners Power Plant
Fruitland, New Mexico

Potentiometric Surface Map
March/April 2019

FIGURE
2-1

wood.

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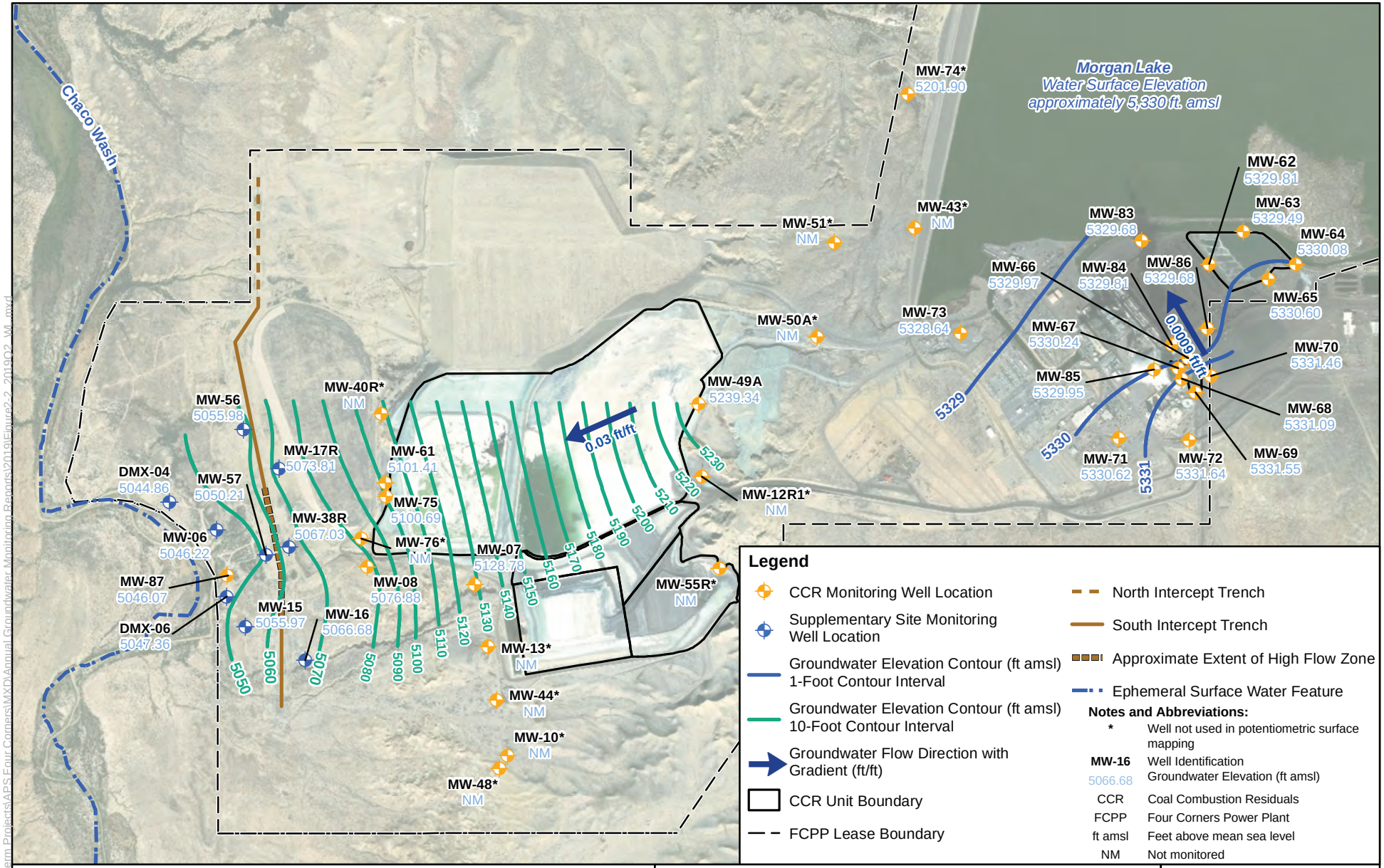

Legend

- CCR Monitoring Well Location
- Supplementary Site Monitoring Well Location
- Groundwater Elevation Contour (ft amsl) 1-Foot Contour Interval
- Groundwater Elevation Contour (ft amsl) 10-Foot Contour Interval
- Groundwater Flow Direction with Gradient (ft/ft)
- CCR Unit Boundary
- FCPP Lease Boundary
- North Intercept Trench
- South Intercept Trench
- Approximate Extent of High Flow Zone
- Ephemeral Surface Water Feature

Notes and Abbreviations:

*	Well not used in potentiometric surface mapping
MW-16	Well Identification
5066.68	Groundwater Elevation (ft amsl)
CCR	Coal Combustion Residuals
FCPP	Four Corners Power Plant
ft amsl	Feet above mean sea level
NM	Not monitored

0 1,800 3,600 Feet

N

Job No.	14-2019-2017
PM:	EHL
Date:	1/31/2020
Scale:	1" = 1800'

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Arizona Public Service
Four Corners Power Plant
Fruitland, New Mexico

Potentiometric Surface Map
May 2019

FIGURE
2-2

wood.

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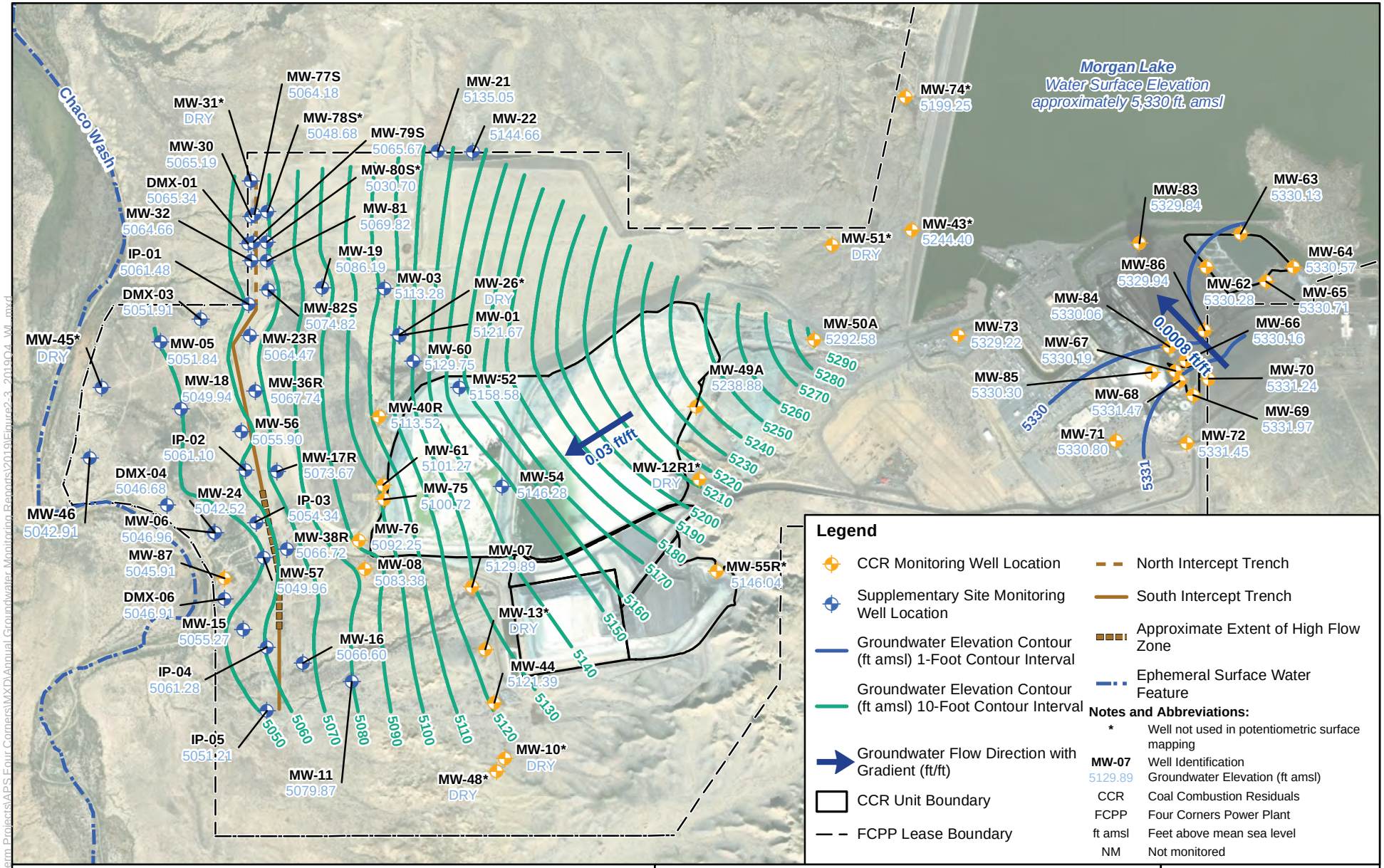

Legend

- CCR Monitoring Well Location
- Supplementary Site Monitoring Well Location
- Groundwater Elevation Contour (ft amsl) 1-Foot Contour Interval
- Groundwater Elevation Contour (ft amsl) 10-Foot Contour Interval
- Groundwater Flow Direction with Gradient (ft/ft)
- CCR Unit Boundary
- FCPP Lease Boundary
- North Intercept Trench
- South Intercept Trench
- Approximate Extent of High Flow Zone
- Ephemeral Surface Water Feature

Notes and Abbreviations:

*	Well not used in potentiometric surface mapping
MW-07	Well Identification
5129.89	Groundwater Elevation (ft amsl)
CCR	Coal Combustion Residuals
FCPP	Four Corners Power Plant
ft amsl	Feet above mean sea level
NM	Not monitored

0 1,800 3,600 Feet

Job No.	14-2019-2017
PM:	EHL
Date:	1/31/2020
Scale:	1" = 1800'

N

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Arizona Public Service
Four Corners Power Plant
Fruitland, New Mexico

Potentiometric Surface Map Nov/Dec 2019

FIGURE **2-3**

wood.

Path: X:\Projects\201-Longterm Projects\APS Four Corners\MXD\Annual Groundwater Monitoring Reports\2019\Figure2-3_2019Q4_WL.mxd

Ash Pond 6
(Closed)

Evaporation
Ponds
(Closed)

MW-60
5129.84

MW-36R
NM

MW-18
NM

MW-40R
5113.54
NS

MW-56
5056.74
<0.010

Lined Ash
Impoundment
(LAI)

IP-2
5061.21

MW-17R
5074.15
<0.010

MW-61
5101.57
0.10

Lined Decant
Water Pond
(LDWP)

MW-54
NM

MW-75
5100.88
0.17

0.03 ft/ft

DMX-4
5043.22
0.013

MW-6
5043.47
<0.010

IP-3
5054.48

MW-57
5057.51
<0.010

MW-38R
5067.51
<0.010

MW-76
Dry

MW-8
5076.44/5075.65
0.011

Chaco Wash

MW-87
Dry

DMX-6
5047.22
<0.010

MW-7
5127.77/5127.94
0.0070/<0.10

Dry Fly Ash
Disposal Area
Site 3

MW-15
5055.45
<0.010

Dry Fly Ash Disposal Area
Site 1

MW-13
Dry

IP-4
5061.43

MW-16
5066.38
<0.010

5050 5060 5070 5080 5090 5100 5110 5120 5130 5140 5150 5160 5170 5180 5190

0 165 330 660
Feet

N

Legend

- CCR Monitoring Well Location
- Supplementary Site Monitoring Well Location
- Four Corners Power Plant Lease Boundary
- Ephemeral Surface Water Feature
- North Intercept Trench
- South Intercept Trench
- Approximate Extent of High Flow Zone
- CCR Unit Boundary

Potentiometric Surface - November 2018

- (Dashed Where Inferred)
- Groundwater Flow Direction with Gradient (ft/ft)

Potentiometric Surface - December 2018

- (Dashed Where Inferred)

Molybdenum Concentration
(November/December 2018)

- >0.1 mg/L
- GWPS (0.1 mg/L; Dashed Where Inferred)

Notes:

MW-49A	Well identification
5240.67	Groundwater Elevation (ft amsl) measured in November/December 2018
0.014	Molybdenum concentration (mg/L)
ft amsl	Feet above mean sea level
GWPS	Groundwater Protection Standard
mg/L	milligram per liter
NM	Not measured
NS	Not enough water to sample

Arizona Public Service
Four Corners Power Plant
Fruitland, New Mexico

FIGURE **3-1**

Molybdenum Iso-Concentration Map for Multiunit 1

Job No.	14-2019-2017
PM:	EHL
Date:	1/31/2020
Scale:	1" = 660'

wood.

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Path: X:\Projects\20-Longterm Projects\APS Four Corners\MXD\Annual Groundwater Monitoring Reports\2019\Figure3-1 Molybdenum Iso-Concentration Contour for Multiunit 1.mxd

Ash Pond 6
(Closed)

Evaporation
Ponds
(Closed)

MW-60
5129.84

MW-18
NM

MW-36R
NM

MW-40R
5113.54
NS

MW-56
5056.74
<0.010

IP-2
5061.21

MW-17R
5074.15
0.091

MW-61
5101.57
0.018/0.022

Lined Decant
Water Pond
(LDWP)

MW-54
NM

Lined Ash
Impoundment
(LAI)

MW-75
5100.88
0.045/0.046

0.03 ft/ft

DMX-4
5043.22
<0.010

IP-3
5054.48

MW-6
5043.47
<0.010

MW-38R
5067.51
0.093

MW-76
Dry

MW-57
5057.51
<0.010

MW-8
5075.65
<0.00050

Chaco Wash

MW-87
Dry

DMX-6
5047.22
<0.010

MW-07
5127.94
<0.010

MW-15
5055.45
<0.010

Dry Fly Ash
Disposal Area
Site 3

Dry Fly Ash Disposal Area
Site 1

IP-4
5061.43

MW-13
Dry

MW-16
5066.38
<0.010

5080 5090 5100 5110 5120 5130 5140 5150 5160 5170 5180 5190

5050 5060 5070 5080 5090 5100 5110 5120

0 275 550 1,100 Feet

N

Legend

- CCR Monitoring Well Location
- Supplementary Site Monitoring Well Location
- Four Corners Power Plant Lease Boundary
- Ephemeral Surface Water Feature
- North Intercept Trench
- South Intercept Trench
- Approximate Extent of High Flow Zone
- CCR Unit Boundary

Potentiometric Surface - November 2018

- (Dashed Where Inferred)
- Groundwater Flow Direction with Gradient (ft/ft)

Potentiometric Surface - December 2018

- (Dashed Where Inferred)

Cobalt Concentration (November/December 2018)

- >0.01 mg/L
- GWPS (0.01 mg/L; Dashed Where Inferred)

Notes:

MW-49A	Well identification
5240.67	Groundwater Elevation (ft amsl) measured in November/December 2018
0.014	Cobalt concentration (mg/L)
ft amsl	Feet above mean sea level
GWPS	Groundwater Protection Standard
mg/L	milligram per liter
NM	Not measured
NS	Not enough water to sample

Arizona Public Service
Four Corners Power Plant
Fruitland, New Mexico

FIGURE **3-2**

Cobalt Iso-Concentration Map for Multiunit 1

Job No.	14-2019-2017
PM:	EHL
Date:	1/31/2020
Scale:	1" = 550'

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Path: X:\Projects\20-Longterm Projects\APS Four Corners\MXD\Annual Groundwater Monitoring Reports\2019\Figure3-2 Cobalt Iso-Concentration Contour for Multiunit 1.mxd

MW-63
5329.96
1.9

MW-83
NM
1.8

MW-62
5330.16
1.5

CWTP

MW-64
5330.50
1.4

MW-65
5330.65
1.9

0.001 ft/ft

MW-73
5329.06
<0.8

MW-86
NM
<0.8

MW-84
NM
<0.8

MW-66
5330.22
25

MW-67
5330.5
16

MW-85
NM
<0.8

MW-70
5331.99
2.7

URS

MW-68
5331.27
12

MW-69
5332.08
11

5330

5332

MW-71
5330.82
<2.0

5331

MW-72
5331.56
<2.0

Legend

- CCR Monitoring Well Location
- Supplementary Site Monitoring Well Location
- CCR Monitoring Well Location Installed in 2018
- CCR Unit Boundary
- FCPP Lease Boundary
- Groundwater Flow Direction with Gradient (ft/ft)

Potentiometric Surface - November 2018

- (Dashed Where Inferred)

Fluoride Concentration (November/December 2018)

- >4 mg/L
- GWPS (4 mg/L)

Notes:

MW-64	Well identification
533.50	Groundwater Elevation (ft amsl) measured in November 2018
1.4	Fluoride concentration (mg/L) sampled in November/December 2018
CCR	Coal Combustion Residuals
CWTP	Combined Waste Treatment Pond
FCPP	Four Corners Power Plant
ft	Feet
ft amsl	Feet above mean sea level
GWPS	Groundwater Protection Standard
mg/L	milligram per liter
NM	Not measured
URS	Upper Retention Sump

0 125 250 500
Feet

N

Arizona Public Service
Four Corners Power Plant
Fruitland, New Mexico

FIGURE **3-3**

Fluoride Iso-Concentration Map for the URS

Job No.	14-2019-2017
PM:	EHL
Date:	1/31/2020
Scale:	1" = 500'

wood.

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Path: X:\Projects\20-Long-term Projects\APS Four Corners\MXD\Hydrogeo Report for URS and Multiunit\Figure3_Fluoride_URS.mxd

APPENDIX A

WOOD TECHNICAL MEMORANDUM DOCUMENTING AN ALTERNATIVE SOURCE DEMONSTRATION FOR THE CWTP

Technical Memorandum

To:	Michele Robertson, RG Pamela Norris	**File No:**	14-2018-2068
From:	Emily LoDolce, PE Rita Neill, PE	**Reviewed by:**	John Leeper, PE Natalie Chrisman Lazarr, PE Carla Landrum, PhD
Date:	July 15, 2019		Daniel A. Kwiecinski, PE

Subject: **ALTERNATIVE SOURCE DEMONSTRATION FOR BORON, CALCIUM, FLUORIDE AND pH AT THE CWTP Arizona Public Service Four Corners Power Plant – Fruitland, New Mexico**

1.0 INTRODUCTION

This technical memorandum (memo) documents an Alternative Source Demonstration (ASD) for the Combined Waste Treatment Pond (CWTP) located at the Arizona Public Service Company (APS) Four Corners Power Plant (FCPP) in Fruitland, New Mexico (the Site). The ASD was prepared pursuant to Coal Combustion Residuals (CCR) Rule requirements for groundwater monitoring and corrective action detailed in 40 Code of Federal Regulations (CFR) Sections (§) 257.90 through 257.98 (Federal Register, 2018).

Site background, CCR groundwater monitoring system, and historical operational information is presented in the *2018 Annual Groundwater Monitoring and Corrective Action Report* (Wood Environment & Infrastructure Solutions, Inc. [Wood], 2019). The CWTP is one of four CCR units at the Site. The CWTP is used as a detention pond for settling and stabilizing ash-impacted and other wastewater flows from the plant prior to discharge to Morgan Lake in accordance with a National Pollutant Discharge Elimination System (NPDES) permit. It was placed into service in 1978.

Statistical evaluations of Appendix III constituent data collected from CWTP compliance monitoring wells (**Figure 1**) in November 2018 declared statistically significant increases (SSI) over respective Background Threshold Values (BTVs) for fluoride (at MW-62, MW-63, MW-64, and MW-65) and pH (at MW-64 and MW-65) and initial exceedances over BTVs (at MW-62 and MW-63) for boron and calcium on April 15, 2019 (Wood 2019b). These four constituents are collectively referred to as "constituents of concern" in this memo. Recent concentrations of these constituents of concern in CWTP compliance wells and supplementary monitoring points are presented in **Figures 2, 3, 4,** and **5**, for boron, calcium, pH, and fluoride, respectively.

Pursuant to 40 CFR §257.94(e)(2) of the CCR Rule, the owner/operator can demonstrate that a source, other than the CCR unit, caused the apparent SSI within 90 days of the official SSI declaration. Potential alternative sources include sampling and analysis errors, anthropogenic causes, and statistical method inadequacies due to natural variation in groundwater quality. Each of these sources are explored within the scope of this memo. Wood's approach to the ASD was to systematically review these potential alternative sources to evaluate if any of these causes resulted in the apparent BTV exceedances observed at CWTP compliance wells.

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2.0 EVALUATION OF POTENTIAL ALTERNATIVE SOURCES

2.1 Sampling and Laboratory Causes

To assess potential sampling and laboratory causes, Wood reviewed sampling and analysis procedures as well as the results of laboratory data validation.

Based on a review of sampling procedures, Wood concluded that APS has conducted field sampling activities in accordance with the groundwater Sampling and Analysis Plan (SAP) developed for the Site (APS, 2018) to comply with the CCR Rule. On the basis that the SAP is sufficiently detailed and contains appropriate procedures for groundwater level measurement, groundwater sample collection, sample control, laboratory analysis, and data validation, no apparent sampling causes for boron, calcium, fluoride and pH exceedances were noted.

Wood also reviewed laboratory data validation reports for the CCR groundwater monitoring program. Following receipt of final laboratory reports of analysis, APS contracts with Wood to evaluate analytical reports and associated sample data collected during detection monitoring for quality assurance purposes. The scope of the laboratory data validation effort is a US Environmental Protection Agency Stage 2A validation. Based on Wood's review, sampling and laboratory analyses errors do not explain the BTV exceedances for boron, calcium, fluoride, and pH observed at the CWTP compliance wells.

2.2 Anthropogenic Sources

To explore the possibility that the SSIs and initial exceedances can be attributed to an alternative anthropogenic source, Wood reviewed historical property uses, surrounding property uses, and upgradient land uses to evaluate whether there are any potential anthropogenic sources (including and other than the CWTP) for the observed boron, calcium, fluoride, and pH exceedances in CWTP compliance wells. This review involved sample collection for the specific purpose of examining potential impacts from surficial property uses (e.g., storage of coal on the land surface) and surface water quality in nearby waterways (e.g., Morgan Lake). A document review was conducted to evaluate potential impacts from subsurface conditions (e.g., geologic formations in which the compliance wells are completed). The results of this review are summarized below.

Composition of CWTP water: An exceedance of the BTV is unlikely to be due to release from the facility if the concentration of the constituent in water collected from the CCR unit is less than the concentrations in downgradient wells. To evaluate this possibility, APS collected water samples from two locations at the CWTP (SW-2 and SW-5, shown in **Figure 1**) on April 1, 2019, and sent them to TestAmerica Laboratories, Inc. (TestAmerica) located in Phoenix, Arizona, for analysis of Appendix III constituents and select general chemistry constituents. TestAmerica is an Arizona Department of Health Services-licensed laboratory (AZ0728). The results of the analysis (**Table 1**) indicate that the concentrations of constituents of concern in the CWTP were lower than the concentrations in the compliance wells.

To estimate how the results from the one-time sampling event on April 1, 2019 fit with historical trends at the CWTP, APS sampling data from Fourth Quarter 2009 through First Quarter 2016 NPDES monitoring events were compared to the April 1, 2019 results. The minimum, maximum, and average values are presented in **Table 1**. Boron, TDS, and Nitrate as N were the only analytes historically sampled for that are in common with the April 1, 2019 analytes. The results from the April 1, 2019 sampling event fall within the range of results from the historical samples, suggesting that the recent results are representative of concentrations in the CWTP. The composition of the CWTP water is a line of evidence to suggest that the

SSIs for fluoride and pH and the initial exceedances for boron and fluoride are not due to releases from the CWTP.

Surficial property uses: With the exception of the power plant and the adjacent coal storage area (**Figure 1**), surrounding land uses include the Navajo Coal Mine to the east and undeveloped, rural land around the Site. The presence of coal dust, possibly from the adjacent coal storage facility, has been noted on the wellheads at the CWTP. APS conducted wipe sampling for boron and fluoride on these wellheads in April 2019 to evaluate if the coal dust is contributing to the exceedances observed at the CWTP. Analyses of the wipe samples did not detect boron or fluoride within the level of sensitivity for the associated test methods (**Appendix A**).

Surface water quality in nearby waterways: The CWTP is located adjacent to the cooling water return canal, which conveys cooling water from the plant to the discharge point in Morgan Lake. Beyond the canal is Morgan Lake. Water levels observed in Morgan Lake, the cooling water canal, and CWTP compliance wells indicate a hydraulic connection between the lake, canal, and uppermost aquifer.

To evaluate the possibility that water in the canal and/or Morgan Lake could be contributing to the exceedances observed at the CWTP, APS collected water quality samples on April 1, 2019 from three locations in the canal (SW-1, SW-3, and SW-6 on **Figure 1**) and one location from Morgan Lake (SW-4). Field parameters collected at the time of water quality sampling indicate that the pH of the water in the canal and Morgan Lake exceeds the upper BTV established for CWTP compliance wells. The analytical results (**Table 1**) suggest that water in the canal and Morgan Lake is not the source of the boron, calcium, or fluoride exceedances, as the concentrations of these constituents in the canal and Morgan Lake are lower than the concentrations in the compliance wells.

Subsurface conditions: Previous reports (AECOM, 2016 and AECOM, 2017) indicate that prior to the construction of the current CWTP, the area where the CWTP is located was used for other purposes. This is apparent since much of the CWTP is underlain by a layer of bottom ash that varies in thickness from three feet (ft) up to 20 ft thick (AECOM, 2016). Applicable anthropogenic source information derived from engineering analysis reports, boring log interpretation, and leachate studies is summarized below:

- The embankment that separates the CWTP from the adjacent cooling water canal was constructed in 1978 using backfill materials excavated from the Site, most likely consisting of alluvium and Weathered Lewis Shale. During a structural integrity analysis of the CWTP embankment (AECOM, 2016), four borings were drilled into the embankment and the cuttings were logged (**Figure 1**). As summarized in **Table 2**, boring logs for test borings that were advanced through the embankment on either side of MW-63 (CWTP-1 and CWTP-4) indicate that fill materials are consistent with the soils logged in the screened interval of MW-63 and that this well is constructed and completed in embankment fill material which likely includes Weathered Lewis Shale. Based on its location and description of encountered soils in boring logs, MW-62 appears to have been constructed through both bottom ash and Weathered Lewis Shale fill material. MW-64 and MW-65 appear to be constructed in a mixture of potential fill materials and Pictured Cliffs Sandstone (monitoring well and test boring logs are presented in **Appendix B**).
- APS conducted a leaching study on materials found in the Site area using the Synthetic Groundwater Leaching Procedure (SGLP) (AECOM, 2018). **Table 3** summarizes analytical results corresponding to leachates derived from testing Site bottom ash, Lewis Shale, and Pictured Cliffs Sandstone samples. Summary observations are as follows:
    - The Lewis Shale is associated with relatively higher sulfate and calcium concentrations;

- The bottom ash is associated with relatively higher pH; and
- The Pictured Cliffs Sandstone is associated with relatively higher fluoride and boron concentrations.

The assessment of boring logs and the leaching study suggest that subsurface conditions could contribute to the variable water quality observed in CWTP compliance wells. To further investigate this premise, Wood developed Stiff diagrams for the compliance wells and the surface water sampling locations (**Figure 6**). Stiff diagrams are graphical representations of general chemistry and allow for visual comparison of individual sampling points. The Stiff diagrams in Figure 6 suggest that MW-62 and MW-63 intercept groundwater that has a different chemical fingerprint than the groundwater intercepted by MW-64 and MW-65, and that MW-64 and MW-65 may be influenced by adjacent surface water bodies.

Isotope evaluation: Isotopic systems have been identified as possible tracers of CCR-impacted water mixing with natural waters (Harkness et al., 2016). To investigate the possibility of the exceedances at the CWTP compliance wells being caused by CCR-impacted water, APS sent groundwater and surface water samples collected in the April 2019 sampling event to Stony Brook University in New York for boron isotope analyses. Boron isotope ratio, $\delta^{11}B$, is the measurement of the ratio of the two isotopes of boron, ^{11}B and ^{10}B, and the isotope ratio of a known standard expressed as a percentile. Results are included in **Appendix C**. For the purpose of this investigation, the $\delta^{11}B$ values were used to evaluate differences in water sources. The $\delta^{11}B$ values for MW-62 and MW-63 were 21.7 and 9.7, respectively, while the values for the remaining samples ranged from -1.2 (at MW-64) to 5.2 (at SW-3).

The review of anthropogenic sources revealed the following:

- Leakage from the CWTP does not appear to be attributable to the recent exceedances, based on a comparison of historical and recent sampling at the CWTP to concentrations of constituents of concern in the compliance wells.
- Coal dust on the surface completions of the monitoring wells does not appear to be contributing to exceedances of fluoride or boron, although re-sampling may be warranted to verify the results of the April 1, 2019 wipe samples.
- Leakage from the cooling water canal and/or Lake Morgan does not appear to be attributable to the recent exceedances of boron, fluoride, or calcium, but could be contributing to elevated pH in the uppermost aquifer.
- Subsurface conditions are likely contributing to the variability of constituent concentrations in CWTP compliance wells. Notably, groundwater from wells MW-62 and MW-63 has a different geochemical signature (**Figure 6**) and boron isotope ratio (**Appendix C**) than groundwater from wells MW-64 and MW-65 and the surface water sampling points. The water quality composition analysis (Stiff diagrams), boron isotope testing, and statistical analysis indicate that MW-64 and MW-65 may be influenced by nearby surface water bodies.

2.3 Statistical Method Cause

A statistical method cause refers to the possibility that the approach used to statistically evaluate collected data is inappropriate for the statistical comparisons performed. The appropriateness of the method is typically determined by whether the underlying assumptions on which the method is based are valid. At the CWTP, there are two potential statistical evaluation causes that could contribute to false positive exceedances of BTVs for one or more constituents. These include:

- **Use of the Double Quantification Rule to evaluate fluoride.** Fluoride is subject to the Double Quantification Rule (DQR) method at the CWTP because 100 percent (%) of background well (i.e., MW-71, MW-72, and MW-73) fluoride concentrations fall below analytical reporting limits. The DQR stipulates that two consecutive detectable constituent concentrations in a compliance well provides sufficient evidence to declare an SSI over background concentrations. However, this method is inappropriate if the reporting limits are inconsistent between background and compliance wells, which is the case for fluoride at the CWTP. Fluoride data collected from CWTP compliance wells have lower reporting limits resulting in a higher detection frequency relative to the background wells. Therefore, under the DQR, the relatively lower reporting limits for fluoride in compliance wells results in a higher likelihood for generating false positive SSI declarations at the CWTP. For the DQR method to be appropriate, the laboratory methods should achieve consistent reporting limits for all monitoring wells. The US Environmental Protection Agency's (EPA's) Unified Guidance presents the basis for implementing the DQR method (US EPA, 2009).
- **Use of Interwell Statistical Comparisons.** Currently, the CWTP groundwater monitoring system is designed to perform interwell statistical comparisons (Wood, 2018a). An interwell comparison is one where samples collected from two different geographic locations within the same water bearing unit are used to perform the statistical evaluation. One geographic location represents background, or expected groundwater conditions if the CWTP is not impacting groundwater, and the other geographic location represents groundwater conditions beneath the CWTP. Sample data collected from the two geographic locations are then statistically compared to assess site compliance. In general, interwell comparisons perform poorly in cases where it is not possible to establish an adequate and representative background location for one or more sample constituents. Factors leading to inadequate or non-representative background can include, for example, spatial heterogeneity in groundwater conditions or discontinuous lithologies between background and compliance monitoring well locations. These inadequacies can cause an interwell statistical comparison to be meaningless and result in false positive or false negative statistical results. The US EPA's Unified Guidance presents the basis for implementing the interwell statistical comparison method (US EPA, 2009).

The BTVs for boron, calcium, fluoride and pH were developed using the data collected from background monitoring wells MW-71, MW-72 and MW-73 (**Figure 1**). Background wells MW-71, MW-72, and MW-73 were identified during development of the monitoring system as completed within the Pictured Cliffs Sandstone. However, MW-71 and MW-72 are located upgradient of the plant site and monitoring well MW-73 is located adjacent to Morgan Lake and cross-gradient to the plant site. None of the background wells used in the analysis of CWTP data are located hydraulically upgradient of the CWTP but were assumed to be representative of upgradient water quality when the monitoring well network was designed, given Site constraints. As the leaching study (AECOM, 2018) revealed, the concentration of fluoride leached from the Pictured Cliffs Sandstone ranged from 0.31 mg/L (below typical laboratory reporting limits for fluoride of 0.4 mg/L to 0.8 mg/L) to 1.4 mg/L, suggesting that placement of the background well could influence subsequent observed concentrations of fluoride based on what is naturally occurring in the Pictured Cliffs Sandstone.

The assessment of the natural variation cause that follows is rooted in the premise that spatial heterogeneity in boron, calcium fluoride, and pH concentrations at the FCPP is not adequately represented by data collected from the background wells and, as such, the underlying interwell assumptions are potentially invalid for one or more constituents.

2.4 Natural Variation Cause

Boron, calcium, fluoride and pH concentrations naturally vary in soil and groundwater but can also vary due to historical site activities, as in the case of the CWTP where the embankment was constructed with fill materials consisting of Lewis Shale and bottom ash. References to natural variation in this section refer to variation in the aquifer due to past human activities as well as variation in formation (i.e., Lewis Shale and Pictured Cliffs Sandstone) composition. A statistical evaluation was conducted to evaluate natural variation as the cause of the background exceedances at the CWTP.

2.4.1 Statistical Evaluation of Natural Variation

The objective of this statistical evaluation was to assess the variability in boron, calcium, pH and fluoride concentrations in groundwater and surface water ambient to the CWTP. This section describes the data inputs, statistical methods, and results.

2.4.1.1 Data Inputs

Data from four groundwater monitoring wells (MW-62, MW-63, MW-64, and MW-65), three designated background wells (MW-71, MW-72, and MW-73) and six surface water samples (SW-1, SW-2, SW-3, SW-4, SW-5 and SW-6) were used to complete this statistical evaluation. Notably, SW-2 and SW-5 are collected from the CWTP (**Figure 1**). The groundwater sampling duration begins in the First Quarter of 2015 and ends in the Second Quarter of 2019. The sampling duration is shorter, and the relative sample count is therefore less, for MW-73 because this well was installed in 2017. The sampling frequency is inconsistent between monitoring wells and ranges from biweekly to quarterly. The surface water samples reflect a single sample event from six different sample locations (**Figure 1**). Surface water samples were collected in Second Quarter 2019.

This evaluation includes four constituents: boron, calcium, fluoride, and pH. Not all constituents were sampled concurrently between wells, which results in sampling gaps for this evaluation depending on the well and the constituent. Non-detect concentrations represent the corresponding reporting limit value.

2.4.1.2 Methods

This section describes the methods and results from three statistical evaluations, including basic statistics, box and whisker plots, and principal component analysis (PCA).

Basic Statistics. **Table 4** summarizes the basic statistics for each monitoring well and constituent. Surface water samples are excluded on the basis that summary statistics are not meaningful using a single sample. Basic statistics are useful for assessing sample counts and making relative comparisons between statistical measures, particularly the range in sample concentrations, the central tendencies (mean and median), and sample standard deviation.

Boron. Monitoring wells MW-62, MW-63 and MW-73 exhibit boron concentrations that are, on average, one order of magnitude higher than the remaining monitoring wells (MW-64, MW-65, MW-71, and MW-72). The sample concentration range and standard deviation for boron are also higher in monitoring wells MW-62, MW-63, and MW-73 relative to the remaining compliance and background wells.

Calcium. Monitoring wells MW-64 and MW-65 exhibit calcium concentrations that are noticeably lower than the remaining compliance and background wells. Monitoring wells MW-62 and MW-63 exhibit calcium

concentrations that are, on average, slightly higher but relatively comparable to the background well monitoring locations, especially monitoring well MW-73.

Fluoride. The non-detect frequency is equal to 100% for all background monitoring well samples (MW-71, MW-72, and MW-73). The summary statistics for the background wells, therefore, reflect a history of inconsistent fluoride reporting limits that range between 0.05 mg/L and 2.0 mg/L. By comparison, the non-detect frequency for the CWTP compliance wells is close to zero. The range of detectable fluoride concentrations in compliance wells range between 1.2 mg/L and 3.3 mg/L, where compliance wells MW-62, MW-63, and MW-65 exhibit the highest relative maximum concentrations for fluoride. Notably, the maximum detectable fluoride concentrations in the compliance wells narrowly exceeds the maximum reporting limit value (2.0 mg/L) for background wells.

pH. Compliance wells MW-64 and MW-65 exhibit higher relative pH values. Compliance wells MW-62 and MW-63 are marginally higher than, but generally comparable to, the pH values observed in the background monitoring wells. Background monitoring well MW-73 exhibits relatively lower pH values.

Box and Whisker Plots. **Figures 7** through **10** illustrate the box and whisker plots for each constituent and sample type (e.g., monitoring well sample or surface water sample). The box and whisker plots are useful for visually comparing the relative distributions of constituent concentrations between sample locations. For surface water samples, the sample count is equal to one for each sample location and the black line represents the sample value.

Boron. The surface sample boron concentrations are generally consistent between sample locations and exhibit concentrations below 0.5 mg/L. The monitoring well that best associates with the surface water samples is background monitoring well MW-72. Monitoring wells MW-64, MW-65, and MW-71 exhibit, on average, boron concentrations slightly above 0.5 mg/L. Compliance wells MW-62 and MW-63 and background well MW-73 show relatively higher sample concentrations that are at least one order of magnitude higher than the surface water samples. The box and whisker plots suggest groundwater conditions at the CWTP exhibit spatial heterogeneity for boron in both background and compliance well locations.

Calcium. The calcium concentrations between surface water samples are relatively consistent near 100 mg/L. Calcium concentrations in compliance wells MW-64 and MW-65 best associate with the surface water samples relative to other monitoring well locations. This finding suggests the groundwater conditions at MW-64 and MW-65 are influenced by surface water sources. The remaining compliance and background monitoring well locations (MW-62, MW-63, MW-71, MW-72, and MW-73) exhibit comparable calcium concentrations that are more likely representative of groundwater conditions. The box and whisker plots suggest groundwater conditions at the CWTP exhibit spatial heterogeneity for calcium at monitoring well locations MW-64 and MW-65 and this spatial heterogeneity might be explained through groundwater-surface water interactions at these monitoring locations.

Fluoride. The detected fluoride concentrations in the surface water samples are generally consistent and range between 0.5 mg/L to 1.0 mg/L. The detected fluoride concentrations in the compliance wells are higher than the surface water samples but exhibit concentrations that are generally below 2.0 mg/L, which reflects the maximum reporting limit value for background wells. Notably, the box and whisker plots for the background wells reflect the variability in laboratory reporting limits and are not necessarily reflective of the in-situ spatial heterogeneity of fluoride groundwater concentrations. The SSI declaration for fluoride at compliance wells MW-62, MW-63, and MW-65 resulted from marginal exceedances, suggesting that the

source to the SSI declaration might be due to statistical uncertainty and/or non-representative background conditions, rather than a leak from the CWTP.

pH. The pH values in the surface water samples are relatively higher than the groundwater samples. The compliance wells that best associate with surface water sample pH values are MW-64 and MW-65, further suggesting that surface water sources might be impacting groundwater at these locations. The background wells exhibit the lowest relative pH values, which are more representative of pH values observed in compliance wells MW-62 and MW-63. The box and whisker plots suggest groundwater conditions at the CWTP exhibit spatial heterogeneity for pH at monitoring well locations MW-64 and MW-65 and this spatial heterogeneity might explain the SSI in pH values over background for compliance wells MW-64 and MW-65.

Principal Component Analysis – Principal component analysis (PCA) is a multivariate analysis that integrates all available data to simultaneously study correlations and associations between wells and their constituents (Everitt et al., 2011; James et al., 2013; Jolliffe, 2013). The correlations and associations can lend insight into the spatial heterogeneity of the groundwater system as it relates to broader geochemistry and general surface-groundwater interactions. Since the four constituents vary in their magnitude of concentration, the data were standardized to mean zero and unit variance prior to performing PCA to account for these differences.

Figure 11 presents the basic results of the PCA. The PCA plots, in general, illustrate how the sample data cluster. The color-coding is used to indicate which monitoring well or surface sample location the sample data derive. Sampling locations that cluster together exhibit synergies in their underlying statistical variation, suggesting the sample data derive from, or are influenced by, the same in-situ properties, mechanisms, and/or processes. The vectors (arrows) represent each sample constituent. The constituent groupings and their vector magnitudes help explain the correlations between constituents and their overall importance. Using this information as a collective, it is possible to interpret the sources of statistical variation observed in the monitoring well clusters.

In general, the PCA results along the x-axis (Principal Component 1) indicate that surface water samples and groundwater samples from monitoring wells MW-64 and MW-65 best associate with each other and are characteristic to higher relative pH values and lower calcium and boron concentrations. These findings further support the surface water-groundwater interaction at these groundwater monitoring locations. Monitoring wells MW-62 and MW-63 associate with higher relative calcium and boron concentrations and lower relative pH values. Background wells MW-71 and MW-72 exhibit considerable variability in terms of their clustering but generally associate better with monitoring well locations MW-62 and MW-63 as it relates to Principal Component 1. Background well MW-73 exhibits lower relative sample variability and generally weighs more on Principal Component 1 relative to the remaining background wells (MW-71 and MW-72), suggesting it might be more representative of boron and calcium background concentrations in groundwater at the CWTP. The lack of variability in MW-73 is likely due to its short sampling duration and high sampling frequency over time (i.e., the groundwater samples are sampled so closely over time they are correlated and, therefore, exhibit less variability).

Fluoride best describes the variability along the y-axis (Principal Component 2) and, in general, separates the background well clusters from the compliance monitoring well clusters. The background wells generally cluster in positive quadrants along the y-axis and the compliance wells generally cluster in the negative quadrants along the y-axis. The fluoride vector plots in the negative quadrants along the y-axis, indicating the compliance wells exhibit higher fluoride concentrations relative to the compliance wells. Because the background fluoride concentrations represent laboratory reporting limits, rather than measurable

groundwater fluoride concentrations, the variability in fluoride concentrations is likely subjective and representative of laboratory sources of variation rather than the natural variation in groundwater conditions.

3.0 FINDINGS AND RECOMMENDATIONS

The data indicate that the exceedances at the CWTP for boron, calcium, fluoride, and pH are not definitively attributable to a leak at the CWTP. Rather, exceedances appear to be associated with spatially inconsistent groundwater chemistry at the CWTP caused by several factors, including past anthropogenic activities impacting subsurface conditions, surface-groundwater interactions, and natural spatial variability in groundwater quality conditions. Multiple lines of chemical and statistical evidence support this conclusion, and are summarized below:

- **Sampling and laboratory causes:** Based on Wood's review, issues with sampling and laboratory analysis do not explain the exceedances.
- **Anthropogenic causes – Subsurface conditions:** MW-62 appears to have been constructed through both bottom ash and Weathered Lewis Shale fill material, MW-63 appears to be constructed and completed in embankment fill material which likely includes Weathered Lewis Shale, and MW-64 and MW-65 appear to be constructed in a mixture of potential fill materials and Pictured Cliffs Sandstone. This difference in subsurface conditions due to previous Site activities appears to be influencing water quality in the wells through a combination of variable leaching of constituents of concern from subsurface materials and the relative ease with which nearby surface water sources are able to infiltrate the aquifer.
- **Anthropogenic causes – Surface-groundwater interactions:** The water quality data, box and whisker plots, and PCA indicate that MW-64 and MW-65 are influenced by surface water infiltration, while MW-62 and MW-63 are more likely representative of groundwater conditions.
- **Statistical methods inadequate due to natural spatial variability:** The statistical evaluations suggest spatial heterogeneity is present and influencing the validity of the statistical evaluations used to calculate the BTVs for the constituents of concern. Specifically:
    - **Boron:** The statistical evaluations suggest spatial heterogeneity is present in background and compliance well locations for boron. Background well MW-73 appears more representative of boron concentrations in compliance wells MW-62 and MW-63. Background wells MW-71 and MW-72 appear more representative of boron concentrations in compliance wells MW-64 and MW-65. Furthermore, temporal heterogeneity appears to be present for boron. The marginal exceedances over background levels for boron are inconsistent over time, proven through re-sampling strategies that provide evidence that these exceedances are not necessarily due to a leak from the CWTP (Wood, 2019b).

      The marginal and inconsistent exceedances over time for boron at the CWTP are thought to result, in part, from sampling inadequacies. Sampling inadequacies result from the high frequency sampling events in background wells prior to October 2017 (i.e., a biweekly sampling frequency). The high frequency sampling events were in direct effort to meet the minimum sampling requirements put forth by the CCR Rule. High sampling frequencies tend to bias the sample variance by causing temporal correlation in the sampled constituent concentrations. This bias results in a lower sample variance. The variance is incorporated into the BTV calculation, resulting in a BTV that is biased low. This bias increases the likelihood of false positive exceedances over background. Additional sampling in background wells at a lower temporal frequency (i.e. semiannual) is necessary to capture intrinsic temporal variation in

boron groundwater concentrations at the CWTP and to have confidence that the boron concentrations in compliance wells are indicative of a release from the CWTP.

Wood recommends continuing interwell statistical evaluations for boron where MW-73 serves as the background well for compliance wells MW-62 and MW-63 and background wells MW-71 and MW-72 serve as background for compliance wells MW-64 and MW-65. Furthermore, as recommended in the Technical Memorandum published in January 2018 and updated August 2018 (Wood, 2018b), boron BTVs should be updated to include sample data collected at a semi-annual frequency since October 2017. **The initial exceedance for boron, therefore, is declared to be spatial and temporal heterogeneity in the compliance and background well samples.**

- **pH.** The statistical evaluations suggest that groundwater pH concentrations at MW-64 and MW-65 are likely impacted by surface water interactions. **The SSI for pH is declared to be surface-groundwater interactions.** These interactions can cause localized spatial heterogeneity in pH concentrations at MW-64 and MW-65 that are not representative of background pH concentrations nor pH concentrations otherwise representative of intrinsic groundwater conditions beneath the CWTP.

  On the premise of spatial heterogeneity, Wood recommends intrawell statistical comparisons for pH in monitoring wells MW-64 and MW-65. Intrawell comparisons are an industry-accepted and recommended alternative to interwell comparisons (U.S. EPA, 2009). Intrawell statistical comparisons are detailed in the USEPA Unified Guidance (2009) and in the Statistical Data Analysis Work Plan for the Four Corners Power Plant (Wood, 2018a). Wood recommends continuing interwell pH comparisons for MW-62 and MW-63 at the CWTP with MW-71, MW-72, and MW-73 as the background wells.

- **Calcium.** There are marginal exceedances over background for calcium in compliance wells MW-62 and MW-63. This statistical evaluation does not support spatial heterogeneity between background and compliance wells as the source to these exceedances.

  Rather, temporal heterogeneity in calcium concentrations appear to best explain exceedances in calcium concentrations at the CWTP. Similar to boron, the marginal exceedances over background levels for calcium are inconsistent over time, proven through re-sampling strategies (Wood, 2019b) that provide evidence that these exceedances are not necessarily due to a leak from the CWTP.

  The marginal and inconsistent exceedances for calcium are thought to result, in part, from the same sampling inadequacies identified in this section for boron. Wood recommends continuing interwell statistical evaluations for calcium and updating calcium BTVs to include sample data collected at a semi-annual frequency since October 2017 (Wood, 2018b).

- **Fluoride.** Background fluoride concentrations represent a 100% non-detect frequency. On this basis, it is difficult to assess the true spatial heterogeneity of fluoride in background groundwater conditions. Therefore, it is difficult to draw conclusions using the current monitoring network as to whether or not spatial heterogeneity is the cause of the fluoride SSI declaration in the CWTP compliance wells during the November 2018 sampling event.

  The fluoride values triggering the SSI declaration at the CWTP marginally exceed the maximum reporting limit value on record (2 mg/L) but are one order of magnitude higher than the updated BTV equal to 0.8 mg/L.

There is evidence to question the appropriateness of the DQR method for fluoride and its representativeness of intrinsic groundwater conditions beneath the CWTP. **The source of detectable fluoride concentrations at the CWTP are likely attributable to the distribution of fill materials known to reside beneath the CWTP which are not necessarily present in the same distribution at background monitoring locations.** On the premise of inadequate and non-representative background conditions for fluoride, Wood recommends intrawell statistical comparisons for this constituent in monitoring wells MW-62, MW-63, MW-64, and MW-65. Intrawell comparisons are an industry-accepted and recommended alternative to interwell comparisons (U.S. EPA, 2009). Intrawell statistical comparisons are detailed in the USEPA Unified Guidance (2009) and in the Statistical Data Analysis Work Plan for the Four Corners Power Plant (Wood, 2018a).

These lines of evidence support this ASD prepared in accordance with 40 CFR §257.95(g)(3)(ii) and support the position that the BTV exceedances for fluoride, boron, chloride, and pH declared on April 15, 2019 were not due to a release from the CWTP. Therefore, Wood recommends that detection monitoring should continue at the CWTP.

4.0 CERTIFICATION

By means of this certification, I certify that I have reviewed this ASD and find the information presented herein accurate and appropriate and meet the requirements of 40 CFR §257.95(g)(3)(ii).



Daniel A. Kwiecinski
Printed Name of Registered Professional Engineer

Signature

13496	New Mexico	15 July 2019
Registration No.	Registration State	Date

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TABLES

Table 1. Comparison of Analyte Concentrations in the CWTP and Associated Groundwater Monitoring Wells

			CWTP Historical Samples (4th Quarter 2009 through 1st Quarter 2016)		Surface Water Samples (see Figure 1 for sample locations)						MW-62			MW-63			MW-64			MW-65		
					SW-1	SW-2	SW-3	SW-4	SW-5	SW-6												
Appendix III Analytes	**Units**	**BTV**	**Min to Max**	**Average**	**4/1/2019**						**11/2/2018**	**4/1/2019**	**5/7/2019**	**11/2/2018**	**4/1/2019**	**5/7/2019**	**11/2/2018**	**4/1/2019**	**5/7/2019**	**11/2/2018**	**4/1/2019**	**5/7/2019**
Boron	mg/L	1.9	0.15 to 2.2	0.75	0.31	0.36	0.33	0.33	0.38	0.31	**2.4**	**2.0**	1.8	1.9	1.2	1.3	0.64	0.48	0.49/0.48	0.77	0.58/0.57	0.60
Calcium	mg/L	540	NS	NS	83	87	86	87	89	84	**550**	530	540	**550**	500	540	88	81	89/88	100	92/90	100
Chloride	mg/L	710	NS	NS	48	50	48	48	53	48	110	110	NS	88	88	NS	50	51	NS	51	52/52	NS
Fluoride	mg/L	(1)	NS	NS	**0.81**	**0.91**	**0.81**	**0.81**	**0.94**	**0.82**	**1.5**	**1.6**	**1.4**	**1.9**	**1.7**	**1.6**	**1.4**	**1.4**	**1.4/1.4**	**1.9**	**1.8/1.9**	**1.7**
pH	SU	(2)	NS	NS	**8.38**	**8.04**	**8.37**	**8.45**	**8.13**	**8.37**	6.46	6.73	6.65	6.66	6.8	6.63	**7.43**	**7.48**	**7.41**	**7.18**	**7.2**	**7.13**
Sulfate	mg/L	13,000	NS	NS	410	450	400	410	450	410	3,300	3,400	NS	2,800	2,600	NS	350	360	NS	420	400/390	NS
Total Dissolved Solids	mg/L	20,000	735 to 1,040	838	760	810	760	760	850	770	5,600	5,500	5,800	4,300	4,300	4,400	760	760	790/780	940	910/930	970
Supplemental Analytes	**Units**	**BTV**	**Min to Max**	**Average**	**4/1/2019**	**4/1/2019**	**4/1/2019**	**4/1/2019**	**4/1/2019**	**4/1/2019**	**11/2/2018**	**4/1/2019**	**5/7/2019**	**11/2/2018**	**4/1/2019**	**5/7/2019**	**11/2/2018**	**4/1/2019**	**5/7/2019**	**11/2/2018**	**4/1/2019**	**5/7/2019**
Alkalinity as CaCO3	mg/L	N/A	NS	NS	120	120	120	120	120	130	NS	690	NS	NS	430	NS	NS	200	NS	NS	290/300	NS
Magnesium	mg/L	N/A	NS	NS	29	31	30	30	31	29	NS	350	NS	NS	260	NS	NS	33	NS	NS	51/50	NS
Nitrate as N	mg/L	N/A	0.03 to 0.22	0.09	<0.10	0.21	<0.10	<0.10	0.19	<0.10	NS	0.61	NS	NS	<0.10	NS	NS	<0.10	NS	NS	0.10/0.10	NS
Nitrite as N	mg/L	N/A	NS	NS	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	NS	<0.10	NS	NS	<0.10	NS	NS	<0.10	NS	NS	<0.10/<0.10	NS
Potassium	mg/L	N/A	NS	NS	6.5	7.0	6.8	6.9	6.8	6.6	NS	9.5	NS	NS	4.9	NS	NS	5.3	NS	NS	3.5/3.5	NS
Sodium	mg/L	N/A	NS	NS	100	110	100	110	110	100	NS	690	NS	NS	280	NS	NS	110	NS	NS	130/120	NS

Notes:

Appendix III constituents of concern are highlighted in dark green; concentrations greater than the BTV are bolded.

(1) The BTV for fluoride equals detectable concentrations exceeding RL (generally 0.8 mg/L), per the DQR.

(2) The BTV for pH varies and is based on a time regression LPL and UPL. As of November 2018, the lower BTV (LPL) was 6.33 and the upper BTV (UPL) was 7.04.

Acronymns:

/ = original / duplicate sample
AWQS = Aquifer Water Quality Standard
BTV = Background Threshold Value
DQR = Double Quantification Rule
LPL = lower prediction limit
max = maximum
mg/L = milligrams per liter
min = minimum
N/A = not applicable
NS = not sampled
RL = laboratory reporting limit
SU = standard units
UPL = upper prediction limit

Table 2. CWTP Boring Log Soil Description Summary

Well or Boring ID	Screened Interval (feet below ground surface)	Summary Soil Description from Boring Log	Fill Description[(1)]	Depth (feet below ground surface)
MW-62	10 to 20	Silty sand; yellowish brown to dark greyish brown with brown mottling	Bottom Ash Fill	0 to 15
		Lean clay with sand, dark grey with light brown mottling	Embankment Fill (likely includes Weathered Lewis Shale)	15 to 20
MW-63	9 to 19	Sandy clay, dark yellowish brown, fine to coarse sand, strong HCL reaction	Embankment Fill (likely includes Weathered Lewis Shale)	0 to 20
MW-64	10 to 20	Clayey sand, light olive brown to olive grey, strong HCL reaction	---	5 to 25
MW-65	8 to 18	Silty sand, light olive brown, slight HCL reaction	---	0 to 20
MW-71	22.5 to 42.5	Sandy silt, brown, slight HCL reaction	---	20 to 29
		Lean clay with sand, dark greyish brown, no HCL reaction	---	29 to 32
		Silty sand	---	32 to 33
		Sandy shale and sandy silt, brown, interbedded	---	33 to 44
MW-72	50.7 to 60.7	Poorly graded sand with silt, very pale brown and yellowish brown, slight HCL reaction	---	5 to 53
		Lean clay with sand, dark greyish brown, strong HCL reaction	---	53 to 54
		Clayey sand, grey	---	54 to 56
		Silty sand, greyish brown, no HCL reaction	---	56 to 61
MW-73	28.9 to 43.9	Poorly graded sand with silt, very pale brown	---	22 to 34
		Clayey sand, grey	---	34 to 42
		Clayey sand, shale, grey	---	42 to 45
CWTP-1	Not Applicable	Sandy lean clay; dark brown, stiff	Embankment Fill (likely includes Weathered Lewis Shale)	0 to 22
		Silty sand	Bottom Ash Fill	22 to 36 (refusal)
CWTP-2 (Near MW-63)	Not Applicable	Sandy lean clay; dark brown, stiff	Embankment Fill (likely includes Weathered Lewis Shale)	0 to 13.5
		Sandy clay with gravel and silt	Embankment Fill (likely includes Weathered Lewis Shale)	13.5 to 20
		Silty sand	Bottom Ash Fill	20 to 22.75

Table 2. CWTP Boring Log Soil Description Summary

Well or Boring ID	Screened Interval (feet below ground surface)	Summary Soil Description from Boring Log	Fill Description[(1)]	Depth (feet below ground surface)
CWTP-3	Not Applicable	Sandy clay	Embankment Fill (likely includes Weathered Lewis Shale)	0-12.25
		Silty sand; brown, very dense	---	12.25 to 23.5 (refusal)
CWTP-4 (Near MW-63	Not Applicable	Sandy clay with gravel	Embankment Fill (likely includes Weathered Lewis Shale)	0 to 16.75
		Silty sand	Bottom Ash Fill	16.75 to 36.5

Notes:

(1) Description informed by boring log and Structural Integrity Assessment (AECOM, 2016)

Table 3. Range of SGLP Analytical Results for Soil Layers found at the CWTP

Material	pH (Standard Units)			Sulfate (mg/L)			Calcium (ug/L)			Fluoride (mg/L)			Boron (mg/L)		
	Min. Detect	Max. Detect	Mean	Min. Detect	Max. Detect	Mean	Min. Detect	Max. Detect	Mean	Min. Detect	Max. Detect	Mean	Min. Detect	Max. Detect	Mean
Bottom Ash	8.1	9.4	9	12	20	14	7,600	14,000	8,800	0.029	0.22	0.085	0.036	0.045	0.041
Lewis Shale	6.9	7.6	7.06	420	1,900	1,400	8,400	470,000	310,000	0.14	0.33	0.22	0.059	0.074	0.065
Pictured Cliffs Sandstone	6.9	8.7	7.76	11	1,200	480	7,200	400,000	160,000	0.31	1.4	0.87	0.092	0.18	0.14

Notes:
Statistics based on 8 samples collected on 10/11/2017
Reference: AECOM, 2018

Acronyms:
mg/L = milligrams per liter
min. = minimum
max. = maximum
SGLP - Synthetic Groundwater Leaching Procedure

Table 4. Basic Statistics for CWTP Background and Compliance Wells.

MW-62	Monitoring Well							
	Units	Sample Count	Mean	Standard Deviation	Median	Minimum	Maximum	Range
Boron	mg/L	13	2.19	0.25	2.3	1.8	2.5	0.7
Calcium	mg/L	13	545.38	27.87	540	510	590	80
Fluoride	mg/L	13	1.75	0.69	1.5	1.2	3.3	2.1
pH	S.U.	13	7.07	0.28	7	6.8	7.6	0.8

MW-63	Monitoring Well							
	Units	Sample Count	Mean	Standard Deviation	Median	Minimum	Maximum	Range
Boron	mg/L	13	1.73	0.29	1.9	1.3	2	0.7
Calcium	mg/L	13	538.46	26.09	540	500	580	80
Fluoride	mg/L	13	2.02	0.27	2	1.6	2.5	0.9
pH	S.U.	13	7.24	0.21	7.2	7.05	7.7	0.65

MW-64	Monitoring Well							
	Units	Sample Count	Mean	Standard Deviation	Median	Minimum	Maximum	Range
Boron	mg/L	13	0.61	0.06	0.64	0.49	0.67	0.18
Calcium	mg/L	13	87.85	2.44	89	82	90	8
Fluoride	mg/L	13	1.47	0.08	1.5	1.4	1.6	0.2
pH	S.U.	13	7.86	0.15	7.8	7.66	8.1	0.44

MW-65	Monitoring Well							
	Units	Sample Count	Mean	Standard Deviation	Median	Minimum	Maximum	Range
Boron	mg/L	13	0.78	0.11	0.77	0.6	0.96	0.36
Calcium	mg/L	13	107.62	15.31	100	93	140	47
Fluoride	mg/L	13	1.95	0.13	2	1.7	2.1	0.4
pH	S.U.	13	7.66	0.18	7.6	7.41	7.9	0.49

MW-71	Monitoring Well							
	Units	Sample Count	Mean	Standard Deviation	Median	Minimum	Maximum	Range
Boron	mg/L	10	0.59	0.08	0.59	0.44	0.7	0.26
Calcium	mg/L	10	461	31.07	465	410	500	90
Fluoride	mg/L	10	1.08	0.82	0.8	0.05	2	1.95
pH	S.U.	10	7.03	0.4	6.95	6.58	7.73	1.15

MW-72	Monitoring Well							
	Units	Sample Count	Mean	Standard Deviation	Median	Minimum	Maximum	Range
Boron	mg/L	10	0.24	0.03	0.24	0.16	0.26	0.1
Calcium	mg/L	10	480	56.76	480	400	570	170
Fluoride	mg/L	10	1.32	0.88	2	0.05	2	1.95
pH	S.U.	10	6.98	0.4	6.86	6.63	7.71	1.08

MW-73	Monitoring Well							
	Units	Sample Count	Mean	Standard Deviation	Median	Minimum	Maximum	Range
Boron	mg/L	5	1.86	0.17	1.9	1.6	2	0.4
Calcium	mg/L	5	516	25.1	510	480	540	60
Fluoride	mg/L	5	0.72	0.18	0.8	0.4	0.8	0.4
pH	S.U.	5	6.74	0.09	6.74	6.64	6.83	0.19

FIGURES



Legend

- CCR Monitoring Well Location
- CWTP Compliance Well Location
- 2016 AECOM Boring Location

Surface Water Sample Location by Water Source

- CWTP
- Cooling Water
- Morgan Lake
- FCPP Lease Boundary

CCR Units

- Combined Waste Treatment Pond (CWTP)
- Upper Retention Sump (URS)

Notes:

MW-64	Well Identification
CCR	Coal Combustion Residuals
CWTP	Combined Waste Treatment Pond
FCPP	Four Corners Power Plant
URS	Upper Retention Sump

0 240 480 960 Feet

N

Arizona Public Service
Four Corners Power Plant
Fruitland, New Mexico

FIGURE **1**

CWTP Monitoring Locations

Job No.	14-2018-2068
PM:	NC
Date:	7/10/2019
Scale:	1" = 200'

wood.

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Path: X:\Projects\20-Longterm Projects\APS Four Corners\MXD\CWTP Alternative Source Demonstration\Figure1_CWTP Monitoring Locations.mxd





Area of Detail

Legend

- Groundwater Monitoring Well
- Exceeds Background Threshold Value for Boron (1.9 mg/L)

Surface Water Sample Location by Water Source

- CWTP
- Cooling Water
- Morgan Lake

Notes:

MW-64	Well identification
0.48	Boron concentration (mg/L) measured in April 2019 for all locations except MW-71, MW-72, MW-73, and MW-83, which were monitored in May 2019
0.58/0.57	Duplicate Result
mg/L	milligram per liter
CWTP	Combined Waste Treatment Pond

0 325 650 Feet

N

Arizona Public Service
Four Corners Power Plant
Fruitland, New Mexico

FIGURE **2**

Boron Concentrations at CWTP Monitoring Locations

Job No.	1420182068
PM:	NC
Date:	7/9/2019
Scale:	1"= 650'

wood.

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Path: X:\Projects\20-Longterm Projects\APS Four Corners\MXD\CWTP Alternative Source Demonstration\Figure2_CWTP_Boron.mxd





Area of Detail

Legend

Groundwater Monitoring Well

Surface Water Sample Location by Water Source

- CWTP
- Cooling Water
- Morgan Lake

* Background Threshold Value for Calcium is 540 mg/L. No results exceed this value.

Notes:

MW-64	Well identification
81	Calcium concentration (mg/L) measured in April 2019 for all locations except MW-71, MW-72, MW-73, and MW-83, which were monitored in May 2019
92/90	Duplicate Result
mg/L	milligram per liter
CWTP	Combined Waste Treatment Pond

0 325 650 Feet

N

Arizona Public Service
Four Corners Power Plant
Fruitland, New Mexico

FIGURE **3**

Calcium Concentrations at CWTP Monitoring Locations

Job No.	1420182068
PM:	NC
Date:	7/9/2019
Scale:	1"= 650'

wood.

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Path: X:\Projects\20-Longterm Projects\APS Four Corners\MXD\CWTP Alternative Source Demonstration\Figure3_CWTP_Calcium.mxd





Area of Detail

Legend

- Groundwater Monitoring Well
- Exceeds Upper Background Threshold Value for pH (7.04 SU)

Surface Water Sample Location by Water Source

- CWTP
- Cooling Water
- Morgan Lake

Notes:

MW-64	Well identification
7.48	pH measured in the laboratory and the field from samples collected in April 2019 for all locations except MW-71, MW-72, MW-73, and MW-83, which were monitored in May 2019
SU	Standard pH units
CWTP	Combined Waste Treatment Pond

N

0 325 650 Feet

Arizona Public Service
Four Corners Power Plant
Fruitland, New Mexico

FIGURE **4**

pH Concentrations at CWTP Monitoring Locations

Job No.	1420182068
PM:	NC
Date:	7/10/2019
Scale:	1"= 650'

wood.

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Path: X:\Projects\20-Longterm Projects\APS Four Corners\MXD\CWTP Alternative Source Demonstration\Figure4_CWTP_pHLabs.mxd





Area of Detail

Legend

- Groundwater Monitoring Well
- Exceeds Background Threshold Value for Fluoride (0.8 mg/L)

Surface Water Sample Location by Water Source

- CWTP
- Cooling Water
- Morgan Lake

Notes:

MW-64	Well identification
1.4	Fluoride concentration (mg/L) measured in March and April 2019 for all locations except MW-71, MW-72, MW-73, and MW-83, which were monitored in May 2019
1.8/1.9	Duplicate Result
mg/L	milligram per liter
CWTP	Combined Waste Treatment Pond

N

0 325 650

Feet

Arizona Public Service
Four Corners Power Plant
Fruitland, New Mexico

FIGURE **5**

Fluoride Concentrations at CWTP Monitoring Locations

Job No.	1420182068
PM:	NC
Date:	7/10/2019
Scale:	1"= 650'

wood.

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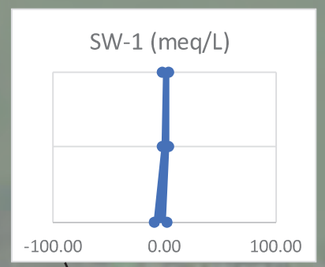
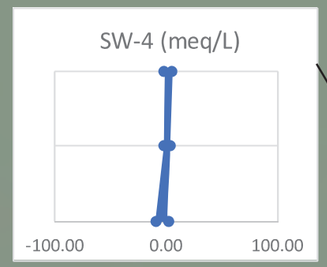
Path: X:\Projects\20-Longterm Projects\APS Four Corners\MXD\CWTP Alternative Source Demonstration\Figure5_CWTP_Fluoride.mxd

Morgan Lake

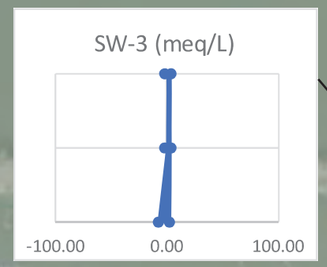
SW-1 (meq/L)



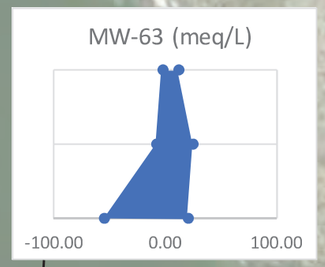
SW-4 (meq/L)



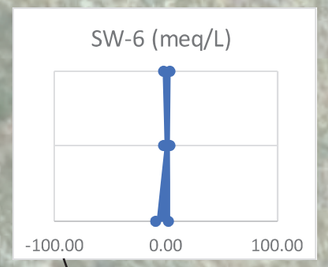
SW-3 (meq/L)



MW-63 (meq/L)



SW-6 (meq/L)



SW-1

SW-4

SW-3

MW-63

MW-83

SW-2

SW-6

SW-5

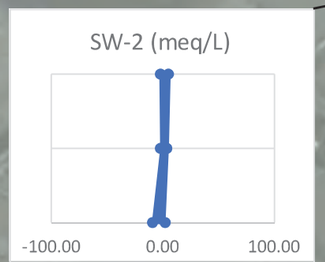
MW-62

CWTP

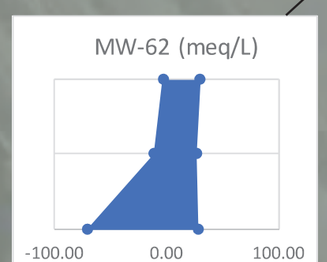
MW-64

MW-65

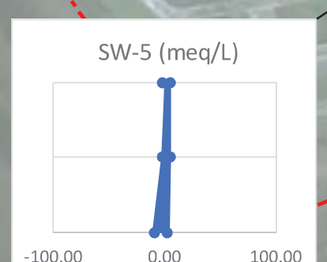
SW-2 (meq/L)



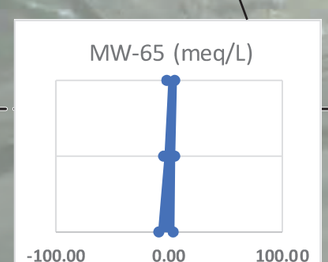
MW-62 (meq/L)



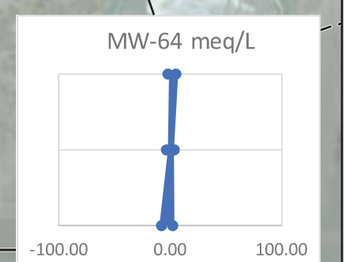
SW-5 (meq/L)



MW-65 (meq/L)



MW-64 meq/L



Legend

- CCR Monitoring Well Location

Surface Water Sample Location by Water Source

- CWTP
- Cooling Water
- Morgan Lake
- Four Corners Power Plant Lease Boundary
- CCR Unit Boundary

Notes:

MW-64 Well identification
CWTP Combined Waste Treatment Pond

0 100 200 400 Feet

N

Arizona Public Service
Four Corners Power Plant
Fruitland, New Mexico

FIGURE **6** **Stiff Diagrams Depicting General Water Quality at CWTP Monitoring Locations**

Job No.	14-2018-2068
PM:	NC
Date:	7/9/2019
Scale:	1" = 200'

wood.

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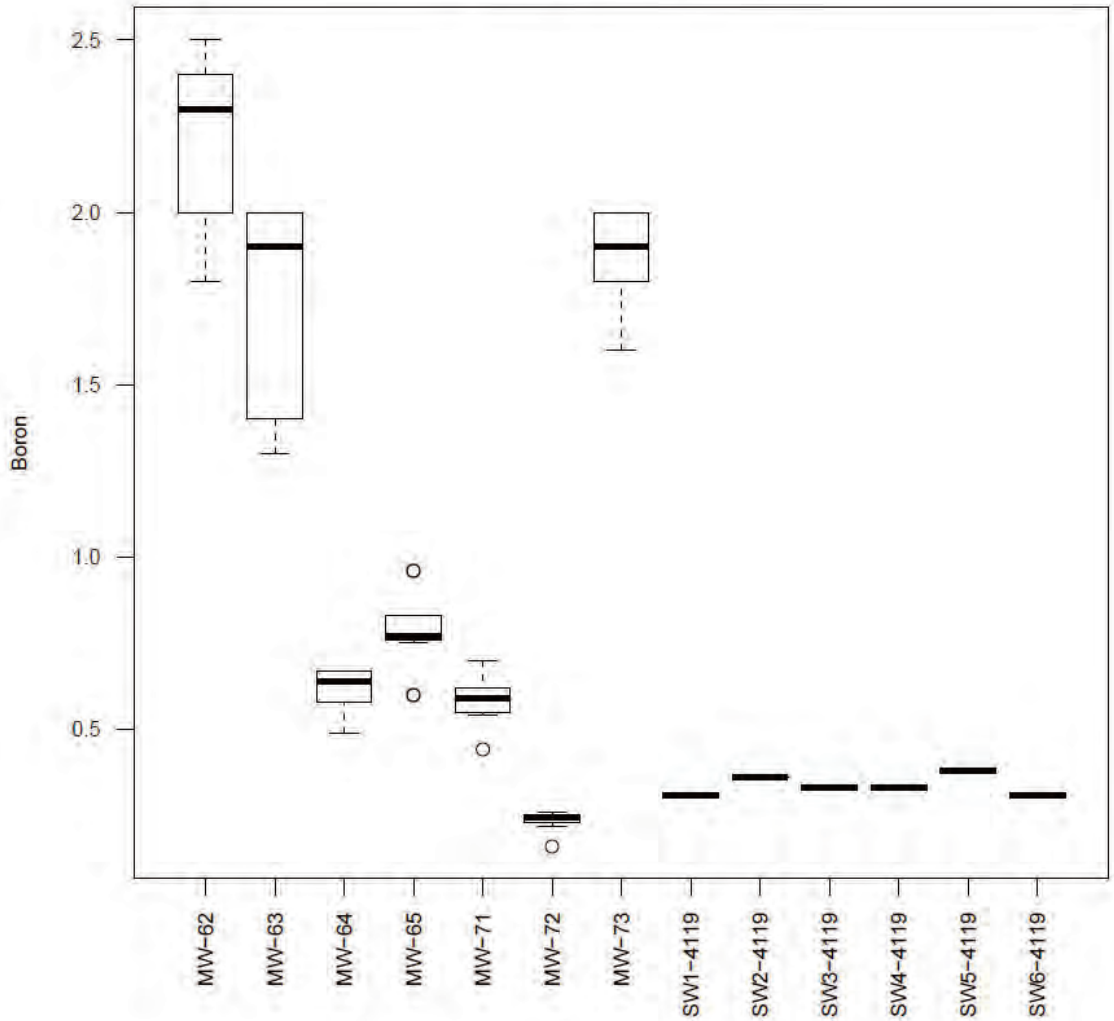
Path: X:\Projects\20-Longterm Projects\APS Four Corners\MXD\CWTP Alternative Source Demonstration\Figure6_StiffDiagrams.ai



Job No.:	14-2018-2068
PM:	NC
Date:	7/9/2019
Scale:	As Shown

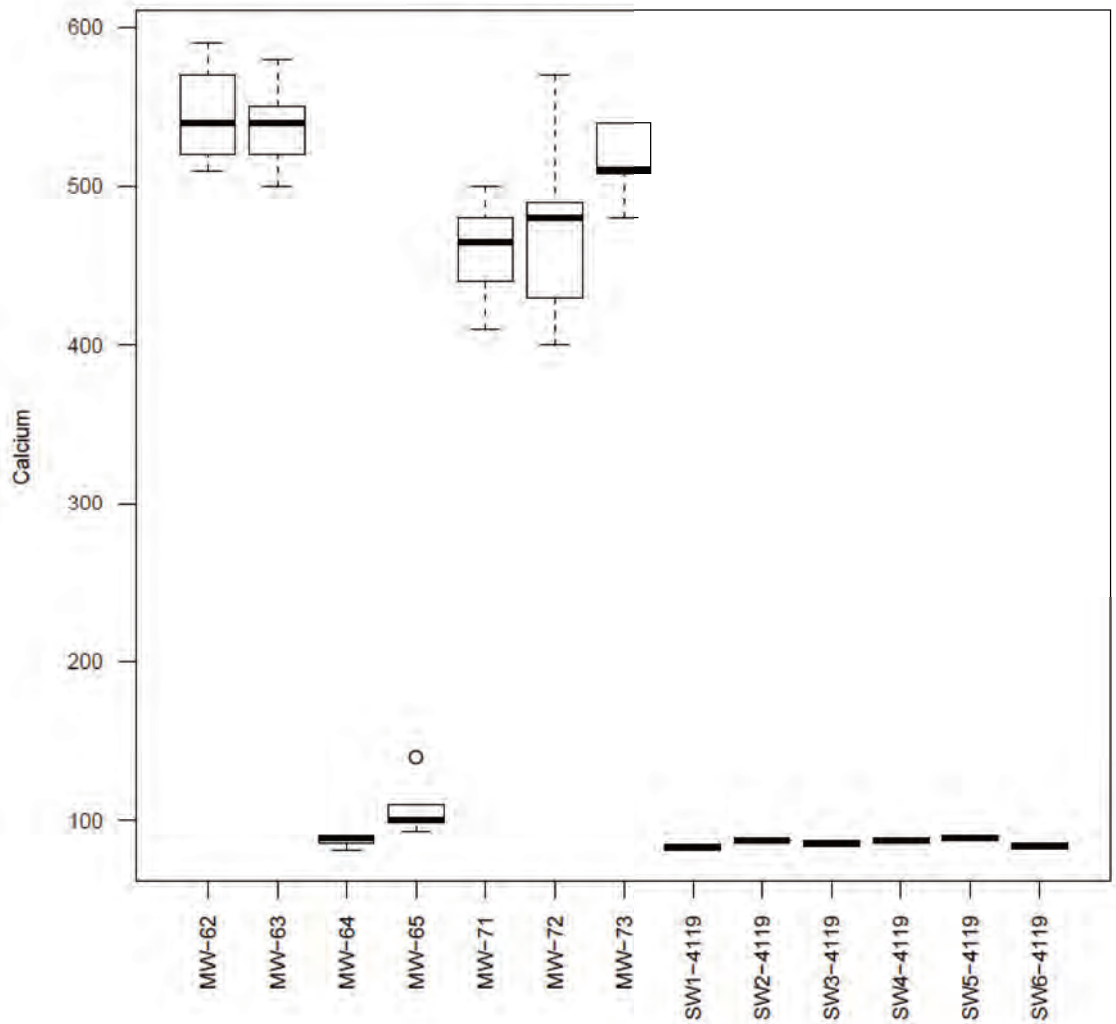
Arizona Public Service
Four Corners Power Plant
Fruitland, New Mexico

Box and Whisker Plot for Boron at CWTP Monitoring Locations

FIGURE
7

wood.

X:\Projects\20-Longterm Projects\APS Four Corners\MXD\CWTP Alternative Source Demonstration\Figure7_BoronBoxandWhisker



Job No.:	14-2018-2068
PM:	NC
Date:	7/9/2019
Scale:	As Shown

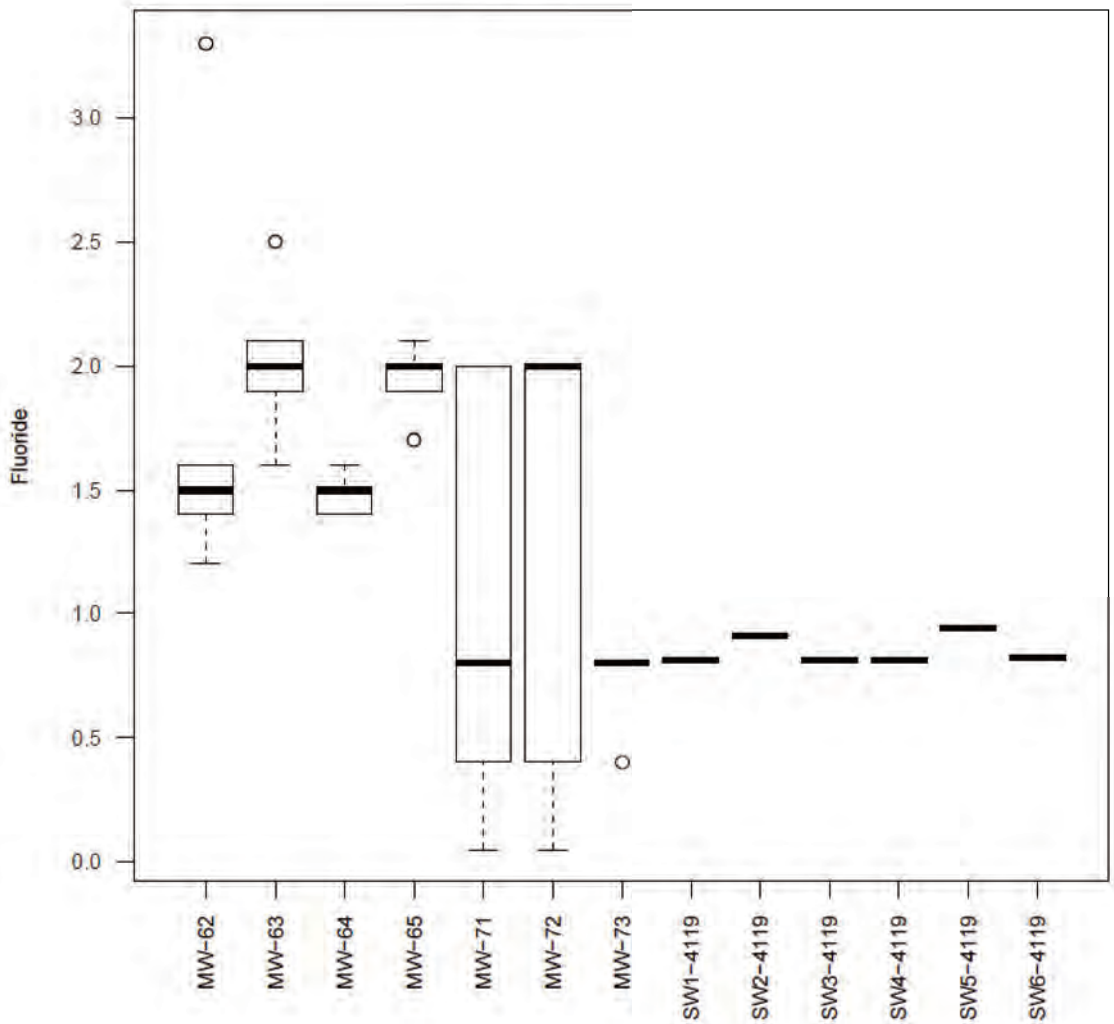
Arizona Public Service
Four Corners Power Plant
Fruitland, New Mexico

Box and Whisker Plot for Calcium at CWTP Monitoring Locations

FIGURE
8

wood.

X:\Projects\20-Longterm Projects\APS Four Corners\MXD\CWTP Alternative Source Demonstration\Figure8_CalciumBoxandWhisker



Job No.:	14-2018-2068
PM:	NC
Date:	7/9/2019
Scale:	As Shown

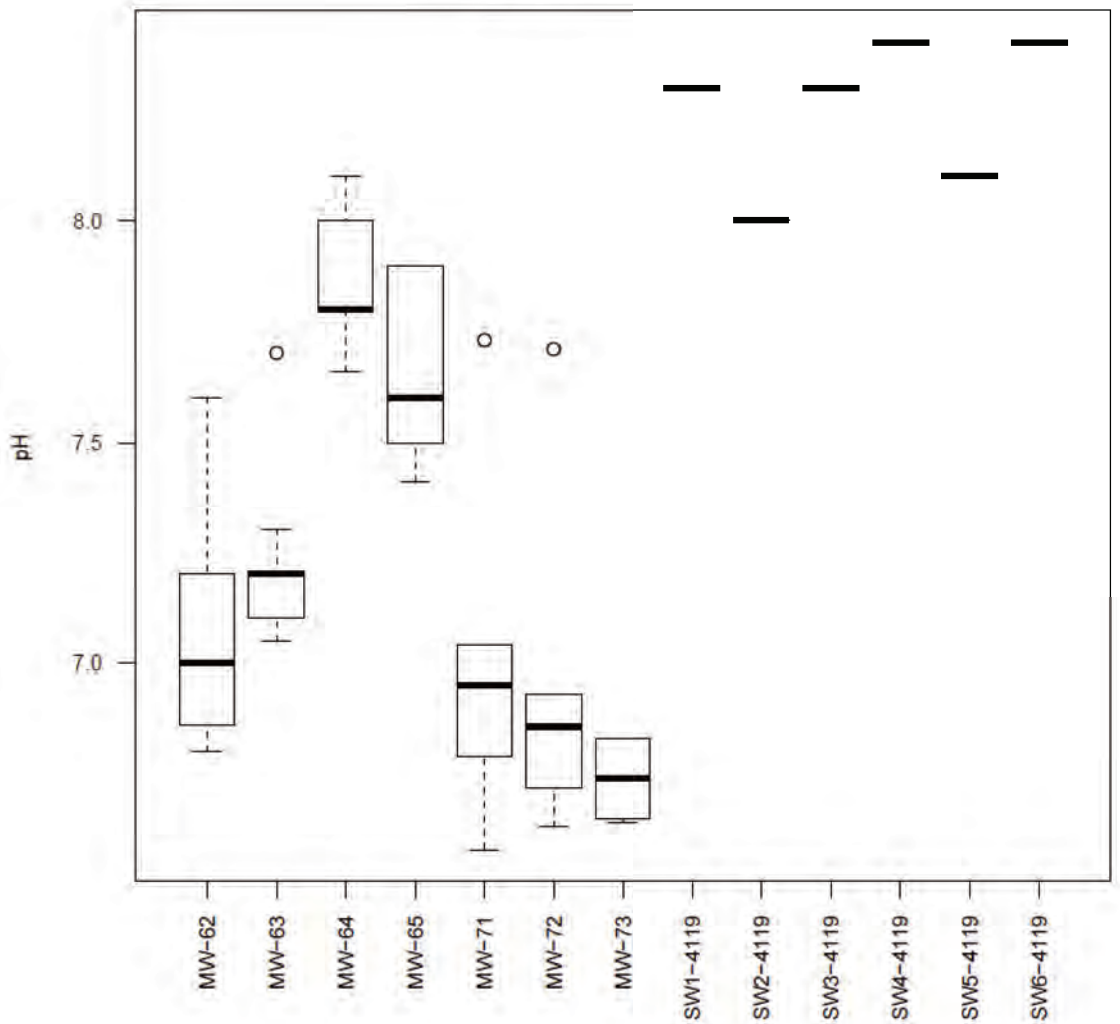
Arizona Public Service
Four Corners Power Plant
Fruitland, New Mexico

Box and Whisker Plot for Fluoride at CWTP Monitoring Locations

FIGURE
9

wood.

X:\Projects\20-Longterm Projects\APS Four Corners\MXD\CWTP Alternative Source Demonstration\Figure9_FluorideBoxandWhisker



Job No.:	14-2018-2068
PM:	NC
Date:	7/9/2019
Scale:	As Shown

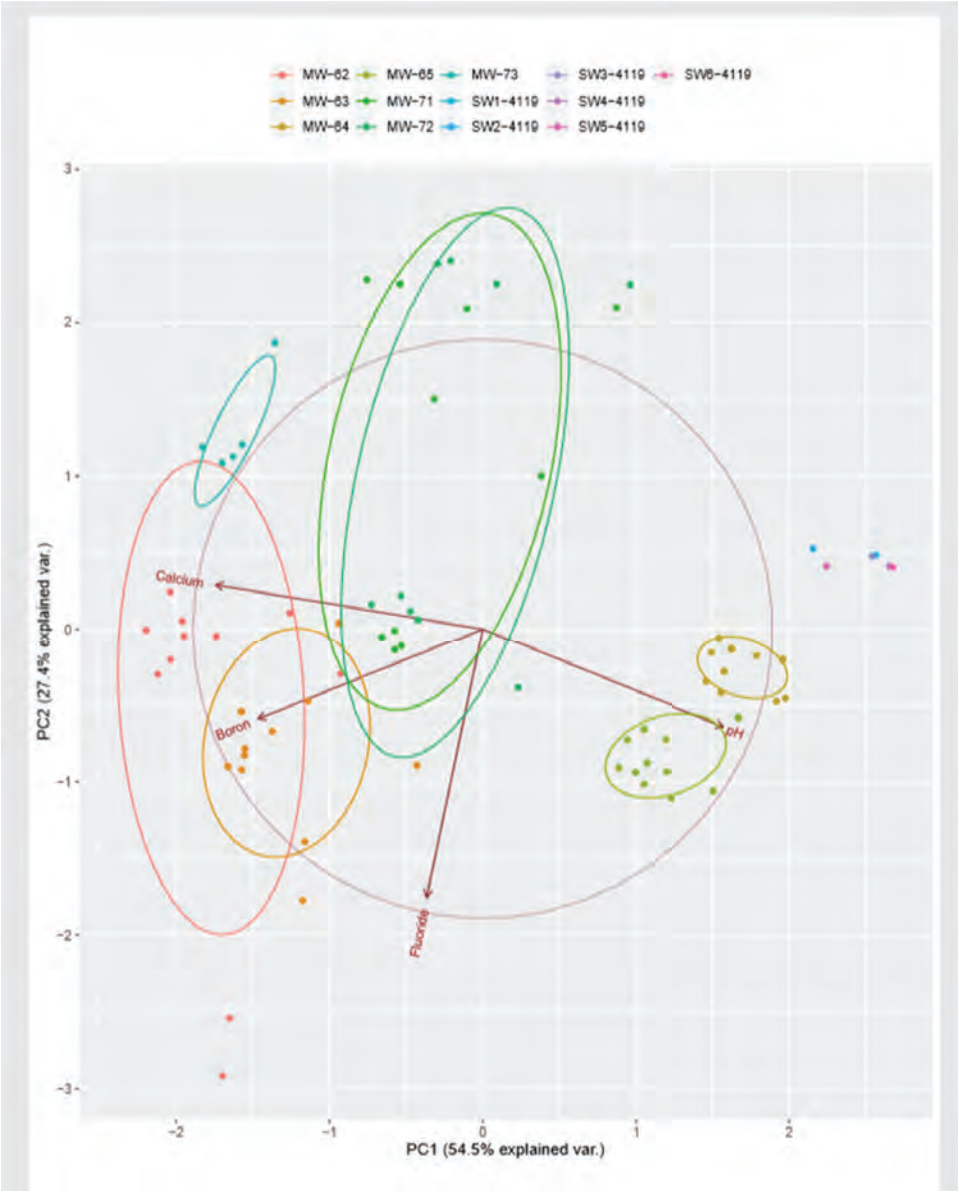
Arizona Public Service
Four Corners Power Plant
Fruitland, New Mexico

Box and Whisker Plot for pH at CWTP Monitoring Locations

FIGURE
10

wood.

X:\Projects\20-Longterm Projects\APS Four Corners\MXD\CWTP Alternative Source Demonstration\Figure10_pHBoxandWhisker



Job No.:	14-2018-2068
PM:	NC
Date:	7/9/2019
Scale:	As Shown

Arizona Public Service
Four Corners Power Plant
Fruitland, New Mexico

PCA Results for CWTP Monitoring Locations

FIGURE
11

wood.

X:\Projects\20-Longterm Projects\APS Four Corners\MXD\CWTP Alternative Source Demonstration\Figure11_PCA Results

APPENDIX A

LABORATORY REPORT FOR ASD SAMPLING EVENT

eurofins | Environment Testing TestAmerica



ANALYTICAL REPORT

Eurofins TestAmerica, Phoenix
4625 East Cotton Ctr Blvd
Suite 189
Phoenix, AZ 85040
Tel: (602)437-3340

Laboratory Job ID: 550-120435-1
Client Project/Site: APS Sampling

For:
Wood E&I Solutions Inc
4600 E. Washington St
6th Floor
Phoenix, Arizona 85034

Attn: Natalie Chrisman

Tracie Pacheco

Authorized for release by:
4/24/2019 1:40:42 PM
Tracie Pacheco, Project Manager I
(602)659-7629
tracie.pacheco@testamericainc.com

Designee for

Rachel Sester, Project Manager I
(602)437-3340
rachel.sester@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

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

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

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Definitions/Glossary

Client: Wood E&I Solutions Inc
Project/Site: APS Sampling

Job ID: 550-120435-1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
D2	Sample required dilution due to high concentration of analyte.
H3	Sample was received and/ or analysis requested past holding time.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated blank spike was acceptable.

Metals

Qualifier	Qualifier Description
L5	The associated blank spike recovery was above laboratory/method acceptance limits. This analyte was not detected in the sample.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated blank spike was acceptable.

General Chemistry

Qualifier	Qualifier Description
D2	Sample required dilution due to high concentration of analyte.
H5	This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.

Glossary

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

Job ID: 550-120435-1

Laboratory: Eurofins TestAmerica, Phoenix

Narrative

Job Narrative
550-120435-1

Comments
No additional comments.

Receipt
The samples were received on 4/3/2019 3:56 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.2º C.

HPLC/IC
Method(s) 300.0: The following sample was received at the laboratory with less than 20 minutes remaining on the 48 hour holding times for Nitrate as N, Nitrite as N, Nitrate Nitrite as N by method EPA 300.0; FC-CCR-SW2-4119 (550-120435-7). There was insufficient time to complete the requested analysis within the method holding time requirement. As such, these data have been reported and qualified with H3 flag.

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

Metals
Method(s) 6010C: The laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for preparation batch 550-174785 and analytical batch 550-175051 recovered outside control limits for the following analytes: boron. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

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

General Chemistry
Method(s) SM 2320B: The sample duplicate precision for the following sample associated with analytical batch 550-174586 was outside control limits: (550-120430-A-2). Non-homogeneity of the sample matrix was suspected. The associated laboratory control sample / laboratory control sample duplicate (LCS/LCSD) precision met acceptance criteria.

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

Sample Summary

Client: Wood E&I Solutions Inc
Project/Site: APS Sampling

Job ID: 550-120435-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
550-120435-1	FC-CCR-MW62-4119	Water	04/01/19 10:30	04/03/19 15:56
550-120435-2	FC-CCR-MW63-4119	Water	04/01/19 09:39	04/03/19 15:56
550-120435-3	FC-CCR-MW64-4119	Water	04/01/19 12:00	04/03/19 15:56
550-120435-4	FC-CCR-MW65-4119	Water	04/01/19 11:10	04/03/19 15:56
550-120435-5	FC-CCR-FD1-4119	Water	04/01/19 09:39	04/03/19 15:56
550-120435-6	FC-CCR-SW1-4119	Water	04/01/19 15:08	04/03/19 15:56
550-120435-7	FC-CCR-SW2-4119	Water	04/01/19 16:39	04/03/19 15:56
550-120435-8	FC-CCR-SW3-4119	Water	04/01/19 12:13	04/03/19 15:56
550-120435-9	FC-CCR-SW4-4119	Water	04/01/19 13:37	04/03/19 15:56
550-120435-10	FC-CCR-SW5-4119	Water	04/01/19 11:23	04/03/19 15:56
550-120435-11	FC-CCR-SW6-4119	Water	04/01/19 15:26	04/03/19 15:56
550-120435-12	FC-CCR-SWB-MW62-4119	Wipe	04/01/19 10:06	04/03/19 15:56
550-120435-13	FC-CCR-SWF-MW62-4119	Wipe	04/01/19 10:06	04/03/19 15:56
550-120435-14	FC-CCR-SWB-MW63-4119	Wipe	04/01/19 11:37	04/03/19 15:56
550-120435-15	FC-CCR-SWF-MW63-4119	Wipe	04/01/19 11:37	04/03/19 15:56
550-120435-16	FC-CCR-SWB-MW64-4119	Wipe	04/01/19 04:10	04/03/19 15:56
550-120435-17	FC-CCR-SWF-MW64-4119	Wipe	04/01/19 10:51	04/03/19 15:56
550-120435-18	FC-CCR-SWB-MW65-4119	Wipe	04/01/19 09:05	04/03/19 15:56
550-120435-19	FC-CCR-SWF-MW65-4119	Wipe	04/01/19 09:05	04/03/19 15:56
550-120435-20	FC-CCR-Swipeblank-4119	Wipe	04/01/19 09:05	04/03/19 15:56

Detection Summary

Client: Wood E&I Solutions Inc
Project/Site: APS Sampling

Job ID: 550-120435-1

Client Sample ID: FC-CCR-MW62-4119 — Lab Sample ID: 550-120435-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Nitrate as N	0.61	H3	0.10		mg/L	1		300.0	Total/NA
Fluoride	1.6		0.40		mg/L	1		300.0	Total/NA
Chloride	110	M3	2.0		mg/L	1		300.0	Total/NA
Sulfate	3400	D2	400		mg/L	200		300.0	Total/NA
Boron	2.0		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	530	M3	2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	350	M3	2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Potassium	9.5		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Sodium	690	M3	0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Alkalinity as CaCO3	690		6.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	690		6.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	5500	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.1	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW63-4119 — Lab Sample ID: 550-120435-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Fluoride	1.7		0.40		mg/L	1		300.0	Total/NA
Chloride	88		2.0		mg/L	1		300.0	Total/NA
Sulfate	2600	D2	400		mg/L	200		300.0	Total/NA
Boron	1.2		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	500		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	260		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Potassium	4.9		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Sodium	280		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Alkalinity as CaCO3	430		6.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	430		6.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	4300	D2	40		mg/L	1		SM 2540C	Total/NA
pH	7.0	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW64-4119 — Lab Sample ID: 550-120435-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Fluoride	1.4		0.40		mg/L	1		300.0	Total/NA
Chloride	51		2.0		mg/L	1		300.0	Total/NA
Sulfate	360	D2	20		mg/L	10		300.0	Total/NA
Boron	0.48		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	81		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	33		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Potassium	5.3		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Sodium	110		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Alkalinity as CaCO3	200		6.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	200		6.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	760		20		mg/L	1		SM 2540C	Total/NA
pH	7.7	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW65-4119 — Lab Sample ID: 550-120435-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Nitrate as N	0.10	H3	0.10		mg/L	1		300.0	Total/NA
Fluoride	1.8		0.40		mg/L	1		300.0	Total/NA
Chloride	52		2.0		mg/L	1		300.0	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Phoenix

Client Sample ID: FC-CCR-MW65-4119 (Continued) — Lab Sample ID: 550-120435-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	400	D2	20		mg/L	10		300.0	Total/NA
Boron	0.58		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	92		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	51		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Potassium	3.5		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Sodium	130		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Alkalinity as CaCO3	290		6.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	290		6.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	910		20		mg/L	1		SM 2540C	Total/NA
pH	7.6	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-FD1-4119 — Lab Sample ID: 550-120435-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Nitrate as N	0.10	H3	0.10		mg/L	1		300.0	Total/NA
Fluoride	1.9		0.40		mg/L	1		300.0	Total/NA
Chloride	52		2.0		mg/L	1		300.0	Total/NA
Sulfate	390	D2	20		mg/L	10		300.0	Total/NA
Boron	0.57		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	90		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	50		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Potassium	3.5		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Sodium	120		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Alkalinity as CaCO3	300		6.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	300		6.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	930		20		mg/L	1		SM 2540C	Total/NA
pH	7.6	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-SW1-4119 — Lab Sample ID: 550-120435-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Fluoride	0.81		0.40		mg/L	1		300.0	Total/NA
Chloride	48		2.0		mg/L	1		300.0	Total/NA
Sulfate	410	D2	20		mg/L	10		300.0	Total/NA
Boron	0.31		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	83		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	29		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Potassium	6.5		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Sodium	100		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Alkalinity as CaCO3	120		6.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	120		6.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	760		20		mg/L	1		SM 2540C	Total/NA
pH	8.3	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-SW2-4119 — Lab Sample ID: 550-120435-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Nitrate as N	0.21	H3	0.10		mg/L	1		300.0	Total/NA
Fluoride	0.91		0.40		mg/L	1		300.0	Total/NA
Chloride	50		2.0		mg/L	1		300.0	Total/NA
Sulfate	450	D2	20		mg/L	10		300.0	Total/NA
Boron	0.36		0.050		mg/L	1		200.7 Rev 4.4	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-SW2-4119 (Continued) — Lab Sample ID: 550-120435-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	87		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	31		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Potassium	7.0		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Sodium	110		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Alkalinity as CaCO3	120		6.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	120		6.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	810		20		mg/L	1		SM 2540C	Total/NA
pH	8.0	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-SW3-4119 — Lab Sample ID: 550-120435-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Fluoride	0.81		0.40		mg/L	1		300.0	Total/NA
Chloride	48		2.0		mg/L	1		300.0	Total/NA
Sulfate	400	D2	20		mg/L	10		300.0	Total/NA
Boron	0.33		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	86		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	30		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Potassium	6.8		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Sodium	100		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Alkalinity as CaCO3	120		6.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	120		6.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	760		20		mg/L	1		SM 2540C	Total/NA
pH	8.3	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-SW4-4119 — Lab Sample ID: 550-120435-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Fluoride	0.81		0.40		mg/L	1		300.0	Total/NA
Chloride	48		2.0		mg/L	1		300.0	Total/NA
Sulfate	410	D2	20		mg/L	10		300.0	Total/NA
Boron	0.33		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	87		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	30		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Potassium	6.9		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Sodium	110		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Alkalinity as CaCO3	120		6.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	120		6.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	760		20		mg/L	1		SM 2540C	Total/NA
pH	8.4	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-SW5-4119 — Lab Sample ID: 550-120435-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Nitrate as N	0.19	H3	0.10		mg/L	1		300.0	Total/NA
Fluoride	0.94		0.40		mg/L	1		300.0	Total/NA
Chloride	53		2.0		mg/L	1		300.0	Total/NA
Sulfate	450	D2	20		mg/L	10		300.0	Total/NA
Boron	0.38		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	89		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	31		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Potassium	6.8		0.50		mg/L	1		200.7 Rev 4.4	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-SW5-4119 (Continued) — Lab Sample ID: 550-120435-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sodium	110		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Alkalinity as CaCO3	120		6.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	120		6.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	850		20		mg/L	1		SM 2540C	Total/NA
pH	8.1	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-SW6-4119 — Lab Sample ID: 550-120435-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Fluoride	0.82		0.40		mg/L	1		300.0	Total/NA
Chloride	48		2.0		mg/L	1		300.0	Total/NA
Sulfate	410	D2	20		mg/L	10		300.0	Total/NA
Boron	0.31		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	84		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	29		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Potassium	6.6		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Sodium	100		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Alkalinity as CaCO3	130		6.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	130		6.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	770		20		mg/L	1		SM 2540C	Total/NA
pH	8.4	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-SWB-MW62-4119 — Lab Sample ID: 550-120435-12

No Detections.

Client Sample ID: FC-CCR-SWF-MW62-4119 — Lab Sample ID: 550-120435-13

No Detections.

Client Sample ID: FC-CCR-SWB-MW63-4119 — Lab Sample ID: 550-120435-14

No Detections.

Client Sample ID: FC-CCR-SWF-MW63-4119 — Lab Sample ID: 550-120435-15

No Detections.

Client Sample ID: FC-CCR-SWB-MW64-4119 — Lab Sample ID: 550-120435-16

No Detections.

Client Sample ID: FC-CCR-SWF-MW64-4119 — Lab Sample ID: 550-120435-17

No Detections.

Client Sample ID: FC-CCR-SWB-MW65-4119 — Lab Sample ID: 550-120435-18

No Detections.

Client Sample ID: FC-CCR-SWF-MW65-4119 — Lab Sample ID: 550-120435-19

No Detections.

Client Sample ID: FC-CCR-Swipeblank-4119 — Lab Sample ID: 550-120435-20

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-MW62-4119

Lab Sample ID: 550-120435-1

Date Collected: 04/01/19 10:30

Matrix: Water

Date Received: 04/03/19 15:56

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.61	H3	0.10		mg/L			04/05/19 18:43	1
Nitrite as N	ND	H3	0.10		mg/L			04/05/19 18:43	1
Fluoride	1.6		0.40		mg/L			04/05/19 18:43	1
Chloride	110	M3	2.0		mg/L			04/05/19 18:43	1
Sulfate	3400	D2	400		mg/L			04/05/19 19:10	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	2.0		0.050		mg/L		04/08/19 08:55	04/09/19 16:49	1
Calcium	530	M3	2.0		mg/L		04/08/19 08:55	04/09/19 16:49	1
Magnesium	350	M3	2.0		mg/L		04/08/19 08:55	04/09/19 16:49	1
Potassium	9.5		0.50		mg/L		04/08/19 08:55	04/09/19 16:49	1
Sodium	690	M3	0.50		mg/L		04/08/19 08:55	04/09/19 16:49	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	5500	D2	100		mg/L			04/04/19 11:55	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	690		6.0		mg/L			04/10/19 13:40	1
Bicarbonate Alkalinity as CaCO3	690		6.0		mg/L			04/10/19 13:40	1
pH	7.1	H5	1.7		SU			04/10/19 11:45	1

Client Sample ID: FC-CCR-MW63-4119

Lab Sample ID: 550-120435-2

Date Collected: 04/01/19 09:39

Matrix: Water

Date Received: 04/03/19 15:56

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND	H3	0.10		mg/L			04/05/19 19:38	1
Nitrite as N	ND	H3	0.10		mg/L			04/05/19 19:38	1
Fluoride	1.7		0.40		mg/L			04/05/19 19:38	1
Chloride	88		2.0		mg/L			04/05/19 19:38	1
Sulfate	2600	D2	400		mg/L			04/05/19 20:05	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.2		0.050		mg/L		04/03/19 22:28	04/09/19 20:31	1
Calcium	500		2.0		mg/L		04/03/19 22:28	04/09/19 20:31	1
Magnesium	260		2.0		mg/L		04/03/19 22:28	04/09/19 20:31	1
Potassium	4.9		0.50		mg/L		04/03/19 22:28	04/09/19 20:31	1
Sodium	280		0.50		mg/L		04/03/19 22:28	04/09/19 20:31	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	4300	D2	40		mg/L			04/04/19 11:55	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	430		6.0		mg/L			04/10/19 13:40	1
Bicarbonate Alkalinity as CaCO3	430		6.0		mg/L			04/10/19 13:40	1
pH	7.0	H5	1.7		SU			04/10/19 11:45	1

Client Sample ID: FC-CCR-MW64-4119

Lab Sample ID: 550-120435-3

Date Collected: 04/01/19 12:00

Matrix: Water

Date Received: 04/03/19 15:56

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND	H3	0.10		mg/L			04/05/19 20:33	1
Nitrite as N	ND	H3	0.10		mg/L			04/05/19 20:33	1
Fluoride	1.4		0.40		mg/L			04/05/19 20:33	1
Chloride	51		2.0		mg/L			04/05/19 20:33	1
Sulfate	360	D2	20		mg/L			04/08/19 18:30	10

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.48		0.050		mg/L		04/03/19 22:28	04/09/19 20:37	1
Calcium	81		2.0		mg/L		04/03/19 22:28	04/09/19 20:37	1
Magnesium	33		2.0		mg/L		04/03/19 22:28	04/09/19 20:37	1
Potassium	5.3		0.50		mg/L		04/03/19 22:28	04/09/19 20:37	1
Sodium	110		0.50		mg/L		04/03/19 22:28	04/09/19 20:37	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	760		20		mg/L			04/04/19 11:55	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	200		6.0		mg/L			04/10/19 13:40	1
Bicarbonate Alkalinity as CaCO3	200		6.0		mg/L			04/10/19 13:40	1
pH	7.7	H5	1.7		SU			04/10/19 11:45	1

Client Sample ID: FC-CCR-MW65-4119

Lab Sample ID: 550-120435-4

Date Collected: 04/01/19 11:10

Matrix: Water

Date Received: 04/03/19 15:56

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.10	H3	0.10		mg/L			04/05/19 21:27	1
Nitrite as N	ND	H3	0.10		mg/L			04/05/19 21:27	1
Fluoride	1.8		0.40		mg/L			04/05/19 21:27	1
Chloride	52		2.0		mg/L			04/05/19 21:27	1
Sulfate	400	D2	20		mg/L			04/05/19 21:55	10

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.58		0.050		mg/L		04/03/19 22:28	04/09/19 20:45	1
Calcium	92		2.0		mg/L		04/03/19 22:28	04/09/19 20:45	1
Magnesium	51		2.0		mg/L		04/03/19 22:28	04/09/19 20:45	1
Potassium	3.5		0.50		mg/L		04/03/19 22:28	04/09/19 20:45	1
Sodium	130		0.50		mg/L		04/03/19 22:28	04/09/19 20:45	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	910		20		mg/L			04/04/19 11:55	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	290		6.0		mg/L			04/10/19 13:40	1
Bicarbonate Alkalinity as CaCO3	290		6.0		mg/L			04/10/19 13:40	1
pH	7.6	H5	1.7		SU			04/10/19 11:45	1

Client Sample ID: FC-CCR-FD1-4119

Lab Sample ID: 550-120435-5

Date Collected: 04/01/19 09:39

Matrix: Water

Date Received: 04/03/19 15:56

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.10	H3	0.10		mg/L			04/05/19 22:22	1
Nitrite as N	ND	H3	0.10		mg/L			04/05/19 22:22	1
Fluoride	1.9		0.40		mg/L			04/05/19 22:22	1
Chloride	52		2.0		mg/L			04/05/19 22:22	1
Sulfate	390	D2	20		mg/L			04/05/19 22:50	10

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.57		0.050		mg/L		04/03/19 22:28	04/09/19 20:48	1
Calcium	90		2.0		mg/L		04/03/19 22:28	04/09/19 20:48	1
Magnesium	50		2.0		mg/L		04/03/19 22:28	04/09/19 20:48	1
Potassium	3.5		0.50		mg/L		04/03/19 22:28	04/09/19 20:48	1
Sodium	120		0.50		mg/L		04/03/19 22:28	04/09/19 20:48	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	930		20		mg/L			04/04/19 11:55	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	300		6.0		mg/L			04/10/19 13:40	1
Bicarbonate Alkalinity as CaCO3	300		6.0		mg/L			04/10/19 13:40	1
pH	7.6	H5	1.7		SU			04/10/19 11:45	1

Client Sample ID: FC-CCR-SW1-4119

Lab Sample ID: 550-120435-6

Date Collected: 04/01/19 15:08

Matrix: Water

Date Received: 04/03/19 15:56

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND	H3	0.10		mg/L			04/06/19 02:02	1
Nitrite as N	ND	H3	0.10		mg/L			04/06/19 02:02	1
Fluoride	0.81		0.40		mg/L			04/06/19 02:02	1
Chloride	48		2.0		mg/L			04/06/19 02:02	1
Sulfate	410	D2	20		mg/L			04/06/19 02:29	10

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.31		0.050		mg/L		04/03/19 22:28	04/09/19 20:51	1
Calcium	83		2.0		mg/L		04/03/19 22:28	04/09/19 20:51	1
Magnesium	29		2.0		mg/L		04/03/19 22:28	04/09/19 20:51	1
Potassium	6.5		0.50		mg/L		04/03/19 22:28	04/09/19 20:51	1
Sodium	100		0.50		mg/L		04/03/19 22:28	04/09/19 20:51	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	760		20		mg/L			04/04/19 11:55	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	120		6.0		mg/L			04/10/19 13:40	1
Bicarbonate Alkalinity as CaCO3	120		6.0		mg/L			04/10/19 13:40	1
pH	8.3	H5	1.7		SU			04/10/19 11:45	1

Client Sample ID: FC-CCR-SW2-4119

Lab Sample ID: 550-120435-7

Date Collected: 04/01/19 16:39

Matrix: Water

Date Received: 04/03/19 15:56

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.21	H3	0.10		mg/L			04/06/19 02:56	1
Nitrite as N	ND	H3	0.10		mg/L			04/06/19 02:56	1
Fluoride	0.91		0.40		mg/L			04/06/19 02:56	1
Chloride	50		2.0		mg/L			04/06/19 02:56	1
Sulfate	450	D2	20		mg/L			04/06/19 03:24	10

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.36		0.050		mg/L		04/03/19 22:28	04/09/19 20:54	1
Calcium	87		2.0		mg/L		04/03/19 22:28	04/09/19 20:54	1
Magnesium	31		2.0		mg/L		04/03/19 22:28	04/09/19 20:54	1
Potassium	7.0		0.50		mg/L		04/03/19 22:28	04/09/19 20:54	1
Sodium	110		0.50		mg/L		04/03/19 22:28	04/09/19 20:54	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	810		20		mg/L			04/04/19 11:55	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	120		6.0		mg/L			04/10/19 13:40	1
Bicarbonate Alkalinity as CaCO3	120		6.0		mg/L			04/10/19 13:40	1
pH	8.0	H5	1.7		SU			04/10/19 11:45	1

Client Sample ID: FC-CCR-SW3-4119

Lab Sample ID: 550-120435-8

Date Collected: 04/01/19 12:13

Matrix: Water

Date Received: 04/03/19 15:56

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND	H3	0.10		mg/L			04/06/19 03:51	1
Nitrite as N	ND	H3	0.10		mg/L			04/06/19 03:51	1
Fluoride	0.81		0.40		mg/L			04/06/19 03:51	1
Chloride	48		2.0		mg/L			04/06/19 03:51	1
Sulfate	400	D2	20		mg/L			04/06/19 04:19	10

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.33		0.050		mg/L		04/03/19 22:28	04/09/19 20:56	1
Calcium	86		2.0		mg/L		04/03/19 22:28	04/09/19 20:56	1
Magnesium	30		2.0		mg/L		04/03/19 22:28	04/09/19 20:56	1
Potassium	6.8		0.50		mg/L		04/03/19 22:28	04/09/19 20:56	1
Sodium	100		0.50		mg/L		04/03/19 22:28	04/09/19 20:56	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	760		20		mg/L			04/04/19 11:55	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	120		6.0		mg/L			04/10/19 13:40	1
Bicarbonate Alkalinity as CaCO3	120		6.0		mg/L			04/10/19 13:40	1
pH	8.3	H5	1.7		SU			04/10/19 11:45	1

Client Sample ID: FC-CCR-SW4-4119

Lab Sample ID: 550-120435-9

Date Collected: 04/01/19 13:37

Matrix: Water

Date Received: 04/03/19 15:56

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND	H3	0.10		mg/L			04/06/19 05:41	1
Nitrite as N	ND	H3	0.10		mg/L			04/06/19 05:41	1
Fluoride	0.81		0.40		mg/L			04/06/19 05:41	1
Chloride	48		2.0		mg/L			04/06/19 05:41	1
Sulfate	410	D2	20		mg/L			04/06/19 06:08	10

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.33		0.050		mg/L		04/03/19 22:28	04/09/19 20:59	1
Calcium	87		2.0		mg/L		04/03/19 22:28	04/09/19 20:59	1
Magnesium	30		2.0		mg/L		04/03/19 22:28	04/09/19 20:59	1
Potassium	6.9		0.50		mg/L		04/03/19 22:28	04/09/19 20:59	1
Sodium	110		0.50		mg/L		04/03/19 22:28	04/09/19 20:59	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	760		20		mg/L			04/04/19 11:55	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	120		6.0		mg/L			04/10/19 13:40	1
Bicarbonate Alkalinity as CaCO3	120		6.0		mg/L			04/10/19 13:40	1
pH	8.4	H5	1.7		SU			04/10/19 11:45	1

Client Sample ID: FC-CCR-SW5-4119

Lab Sample ID: 550-120435-10

Date Collected: 04/01/19 11:23

Matrix: Water

Date Received: 04/03/19 15:56

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.19	H3	0.10		mg/L			04/06/19 06:36	1
Nitrite as N	ND	H3	0.10		mg/L			04/06/19 06:36	1
Fluoride	0.94		0.40		mg/L			04/06/19 06:36	1
Chloride	53		2.0		mg/L			04/06/19 06:36	1
Sulfate	450	D2	20		mg/L			04/06/19 07:03	10

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.38		0.050		mg/L		04/03/19 22:28	04/09/19 21:02	1
Calcium	89		2.0		mg/L		04/03/19 22:28	04/09/19 21:02	1
Magnesium	31		2.0		mg/L		04/03/19 22:28	04/09/19 21:02	1
Potassium	6.8		0.50		mg/L		04/03/19 22:28	04/09/19 21:02	1
Sodium	110		0.50		mg/L		04/03/19 22:28	04/09/19 21:02	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	850		20		mg/L			04/04/19 11:55	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	120		6.0		mg/L			04/10/19 13:40	1
Bicarbonate Alkalinity as CaCO3	120		6.0		mg/L			04/10/19 13:40	1
pH	8.1	H5	1.7		SU			04/10/19 11:45	1

Client Sample ID: FC-CCR-SW6-4119

Lab Sample ID: 550-120435-11

Date Collected: 04/01/19 15:26

Matrix: Water

Date Received: 04/03/19 15:56

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND	H3	0.10		mg/L			04/06/19 11:10	1
Nitrite as N	ND	H3	0.10		mg/L			04/06/19 11:10	1
Fluoride	0.82		0.40		mg/L			04/06/19 11:10	1
Chloride	48		2.0		mg/L			04/06/19 11:10	1
Sulfate	410	D2	20		mg/L			04/06/19 11:37	10

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.31		0.050		mg/L		04/03/19 22:28	04/09/19 21:05	1
Calcium	84		2.0		mg/L		04/03/19 22:28	04/09/19 21:05	1
Magnesium	29		2.0		mg/L		04/03/19 22:28	04/09/19 21:05	1
Potassium	6.6		0.50		mg/L		04/03/19 22:28	04/09/19 21:05	1
Sodium	100		0.50		mg/L		04/03/19 22:28	04/09/19 21:05	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	770		20		mg/L			04/04/19 11:55	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	130		6.0		mg/L			04/10/19 13:40	1
Bicarbonate Alkalinity as CaCO3	130		6.0		mg/L			04/10/19 13:40	1
pH	8.4	H5	1.7		SU			04/10/19 11:45	1

Client Sample ID: FC-CCR-SWB-MW62-4119

Lab Sample ID: 550-120435-12

Date Collected: 04/01/19 10:06

Matrix: Wipe

Date Received: 04/03/19 15:56

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND	L5	50		ug/Wipe		04/12/19 05:30	04/16/19 02:24	1

Client Sample ID: FC-CCR-SWF-MW62-4119

Lab Sample ID: 550-120435-13

Date Collected: 04/01/19 10:06

Matrix: Wipe

Date Received: 04/03/19 15:56

Method: 9056A - Anions, Ion Chromatography - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.020		mg/wipe			04/09/19 21:46	1

Client Sample ID: FC-CCR-SWB-MW63-4119

Lab Sample ID: 550-120435-14

Date Collected: 04/01/19 11:37

Matrix: Wipe

Date Received: 04/03/19 15:56

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND	L5	50		ug/Wipe		04/12/19 05:30	04/16/19 02:27	1

Client Sample ID: FC-CCR-SWF-MW63-4119
Lab Sample ID: 550-120435-15
Date Collected: 04/01/19 11:37
Matrix: Wipe
Date Received: 04/03/19 15:56

Method: 9056A - Anions, Ion Chromatography - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.020		mg/wipe			04/09/19 22:04	1

Client Sample ID: FC-CCR-SWB-MW64-4119
Lab Sample ID: 550-120435-16
Date Collected: 04/01/19 04:10
Matrix: Wipe
Date Received: 04/03/19 15:56

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND	L5	50		ug/Wipe		04/12/19 05:30	04/16/19 02:32	1

Client Sample ID: FC-CCR-SWF-MW64-4119
Lab Sample ID: 550-120435-17
Date Collected: 04/01/19 10:51
Matrix: Wipe
Date Received: 04/03/19 15:56

Method: 9056A - Anions, Ion Chromatography - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.020		mg/wipe			04/09/19 22:23	1

Client Sample ID: FC-CCR-SWB-MW65-4119
Lab Sample ID: 550-120435-18
Date Collected: 04/01/19 09:05
Matrix: Wipe
Date Received: 04/03/19 15:56

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND	L5	50		ug/Wipe		04/12/19 05:30	04/16/19 02:35	1

Client Sample ID: FC-CCR-SWF-MW65-4119
Lab Sample ID: 550-120435-19
Date Collected: 04/01/19 09:05
Matrix: Wipe
Date Received: 04/03/19 15:56

Method: 9056A - Anions, Ion Chromatography - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.020		mg/wipe			04/09/19 22:41	1

Client Sample ID: FC-CCR-Swipeblank-4119
Lab Sample ID: 550-120435-20
Date Collected: 04/01/19 09:05
Matrix: Wipe
Date Received: 04/03/19 15:56

Method: 9056A - Anions, Ion Chromatography - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.020		mg/wipe			04/09/19 21:28	1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 550-174235/2
Matrix: Water
Analysis Batch: 174235

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.10		mg/L			04/05/19 16:26	1
Nitrite as N	ND		0.10		mg/L			04/05/19 16:26	1
Fluoride	ND		0.40		mg/L			04/05/19 16:26	1
Chloride	ND		2.0		mg/L			04/05/19 16:26	1
Sulfate	ND		2.0		mg/L			04/05/19 16:26	1

Lab Sample ID: LCS 550-174235/5
Matrix: Water
Analysis Batch: 174235

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	4.00	4.02		mg/L		100	90 - 110
Nitrite as N	4.00	4.20		mg/L		105	90 - 110
Fluoride	4.00	4.06		mg/L		101	90 - 110
Chloride	20.0	20.3		mg/L		102	90 - 110
Sulfate	20.0	19.9		mg/L		99	90 - 110

Lab Sample ID: LCSD 550-174235/6
Matrix: Water
Analysis Batch: 174235

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate as N	4.00	4.03		mg/L		101	90 - 110	0	20
Nitrite as N	4.00	4.20		mg/L		105	90 - 110	0	20
Fluoride	4.00	4.06		mg/L		102	90 - 110	0	20
Chloride	20.0	20.3		mg/L		102	90 - 110	0	20
Sulfate	20.0	19.9		mg/L		99	90 - 110	0	20

Lab Sample ID: 550-120435-1 MS
Matrix: Water
Analysis Batch: 174235

Client Sample ID: FC-CCR-MW62-4119
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	0.61	H3	4.00	4.65	H3	mg/L		101	80 - 120
Nitrite as N	ND	H3	4.00	4.22	H3	mg/L		105	80 - 120
Fluoride	1.6		4.00	5.55		mg/L		99	80 - 120
Chloride	110	M3	20.0	126	M3	mg/L		73	80 - 120

Lab Sample ID: 550-120435-1 MS
Matrix: Water
Analysis Batch: 174235

Client Sample ID: FC-CCR-MW62-4119
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	3400	D2	4000	7300	D2	mg/L		98	80 - 120

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 550-120435-1 MSD
Matrix: Water
Analysis Batch: 174235

Client Sample ID: FC-CCR-MW62-4119
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate as N	0.61	H3	4.00	4.66	H3	mg/L		101	80 - 120	0	20
Nitrite as N	ND	H3	4.00	4.29	H3	mg/L		107	80 - 120	2	20
Fluoride	1.6		4.00	5.57		mg/L		99	80 - 120	0	20
Chloride	110	M3	20.0	126	M3	mg/L		73	80 - 120	0	20

Lab Sample ID: 550-120435-1 MSD
Matrix: Water
Analysis Batch: 174235

Client Sample ID: FC-CCR-MW62-4119
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	3400	D2	4000	7220	D2	mg/L		96	80 - 120	1	20

Lab Sample ID: MB 550-174396/2
Matrix: Water
Analysis Batch: 174396

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.10		mg/L			04/08/19 16:58	1
Nitrite as N	ND		0.10		mg/L			04/08/19 16:58	1
Fluoride	ND		0.40		mg/L			04/08/19 16:58	1
Chloride	ND		2.0		mg/L			04/08/19 16:58	1
Sulfate	ND		2.0		mg/L			04/08/19 16:58	1

Lab Sample ID: LCS 550-174396/5
Matrix: Water
Analysis Batch: 174396

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	4.00	4.08		mg/L		102	90 - 110
Nitrite as N	4.00	4.33		mg/L		108	90 - 110
Fluoride	4.00	3.98		mg/L		99	90 - 110
Chloride	20.0	20.6		mg/L		103	90 - 110
Sulfate	20.0	19.9		mg/L		100	90 - 110

Lab Sample ID: LCSD 550-174396/6
Matrix: Water
Analysis Batch: 174396

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate as N	4.00	4.08		mg/L		102	90 - 110	0	20
Nitrite as N	4.00	4.34		mg/L		108	90 - 110	0	20
Fluoride	4.00	3.99		mg/L		100	90 - 110	0	20
Chloride	20.0	20.6		mg/L		103	90 - 110	0	20
Sulfate	20.0	19.9		mg/L		100	90 - 110	0	20

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 550-120553-A-1 MS
Matrix: Water
Analysis Batch: 174396

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Nitrate as N	0.34		4.00	4.47		mg/L		103	80 - 120		
Nitrite as N	ND		4.00	4.09		mg/L		102	80 - 120		
Fluoride	ND		4.00	4.17		mg/L		97	80 - 120		

Lab Sample ID: 550-120553-A-1 MS ^10
Matrix: Water
Analysis Batch: 174396

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride	83	D2	200	302	D2	mg/L		109	80 - 120		
Sulfate	220	D2	200	423	D2	mg/L		102	80 - 120		

Lab Sample ID: 550-120553-A-1 MSD
Matrix: Water
Analysis Batch: 174396

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate as N	0.34		4.00	4.50		mg/L		104	80 - 120	1	20
Nitrite as N	ND		4.00	4.15		mg/L		104	80 - 120	1	20
Fluoride	ND		4.00	4.19		mg/L		97	80 - 120	1	20

Lab Sample ID: 550-120553-A-1 MSD ^10
Matrix: Water
Analysis Batch: 174396

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	83	D2	200	298	D2	mg/L		107	80 - 120	1	20
Sulfate	220	D2	200	418	D2	mg/L		100	80 - 120	1	20

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 550-174463/1-A
Matrix: Wipe
Analysis Batch: 174533

Client Sample ID: Method Blank
Prep Type: Soluble

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.020		mg/wipe			04/09/19 20:32	1

Lab Sample ID: LCS 550-174463/2-A
Matrix: Wipe
Analysis Batch: 174533

Client Sample ID: Lab Control Sample
Prep Type: Soluble

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride			0.200	0.182		mg/wipe		91	80 - 120		

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

Lab Sample ID: LCSD 550-174463/3-A
Matrix: Wipe
Analysis Batch: 174533

Client Sample ID: Lab Control Sample Dup
Prep Type: Soluble

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride			0.200	0.183		mg/wipe		91	80 - 120	0	20

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 550-173948/1-A
Matrix: Water
Analysis Batch: 174517

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 173948

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.050		mg/L		04/03/19 22:28	04/09/19 19:49	1
Calcium	ND		2.0		mg/L		04/03/19 22:28	04/09/19 19:49	1
Magnesium	ND		2.0		mg/L		04/03/19 22:28	04/09/19 19:49	1
Potassium	ND		0.50		mg/L		04/03/19 22:28	04/09/19 19:49	1
Sodium	ND		0.50		mg/L		04/03/19 22:28	04/09/19 19:49	1

Lab Sample ID: LCS 550-173948/3-A
Matrix: Water
Analysis Batch: 174517

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 173948

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Boron			1.00	0.900		mg/L		90	85 - 115		
Calcium			21.0	19.8		mg/L		94	85 - 115		
Magnesium			21.0	19.6		mg/L		93	85 - 115		
Potassium			20.0	18.3		mg/L		92	85 - 115		
Sodium			20.0	17.8		mg/L		89	85 - 115		

Lab Sample ID: LCSD 550-173948/4-A
Matrix: Water
Analysis Batch: 174517

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 173948

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron			1.00	0.899		mg/L		90	85 - 115	0	20
Calcium			21.0	19.9		mg/L		95	85 - 115	0	20
Magnesium			21.0	19.7		mg/L		94	85 - 115	0	20
Potassium			20.0	18.4		mg/L		92	85 - 115	0	20
Sodium			20.0	17.9		mg/L		90	85 - 115	1	20

Lab Sample ID: 550-120327-C-1-A MS ^T
Matrix: Water
Analysis Batch: 174517

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 173948

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Boron	0.16		1.00	1.07		mg/L		91	70 - 130		
Calcium	61		21.0	78.1		mg/L		80	70 - 130		
Magnesium	35		21.0	52.5		mg/L		85	70 - 130		
Potassium	2.7		20.0	21.3		mg/L		93	70 - 130		
Sodium	42		20.0	57.5		mg/L		78	70 - 130		

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: 550-120327-C-1-B MSD ^T
Matrix: Water
Analysis Batch: 174517

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 173948

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	0.16		1.00	1.08		mg/L		92	70 - 130	1	20
Calcium	61		21.0	78.6		mg/L		82	70 - 130	1	20
Magnesium	35		21.0	52.7		mg/L		86	70 - 130	0	20
Potassium	2.7		20.0	21.2		mg/L		93	70 - 130	0	20
Sodium	42		20.0	57.9		mg/L		80	70 - 130	1	20

Lab Sample ID: MB 550-174224/1-A
Matrix: Water
Analysis Batch: 174515

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 174224

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.050		mg/L		04/08/19 08:55	04/09/19 16:26	1
Calcium	ND		2.0		mg/L		04/08/19 08:55	04/09/19 16:26	1
Magnesium	ND		2.0		mg/L		04/08/19 08:55	04/09/19 16:26	1
Potassium	ND		0.50		mg/L		04/08/19 08:55	04/09/19 16:26	1
Sodium	ND		0.50		mg/L		04/08/19 08:55	04/09/19 16:26	1

Lab Sample ID: LCS 550-174224/3-A
Matrix: Water
Analysis Batch: 174515

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 174224

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.00	0.958		mg/L		96	85 - 115
Calcium	21.0	20.9		mg/L		99	85 - 115
Magnesium	21.0	20.7		mg/L		99	85 - 115
Potassium	20.0	19.7		mg/L		98	85 - 115
Sodium	20.0	19.1		mg/L		95	85 - 115

Lab Sample ID: LCSD 550-174224/4-A
Matrix: Water
Analysis Batch: 174515

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 174224

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	1.00	0.952		mg/L		95	85 - 115	1	20
Calcium	21.0	20.7		mg/L		98	85 - 115	1	20
Magnesium	21.0	20.7		mg/L		98	85 - 115	0	20
Potassium	20.0	19.6		mg/L		98	85 - 115	1	20
Sodium	20.0	19.1		mg/L		95	85 - 115	0	20

Lab Sample ID: 550-120435-1 MS
Matrix: Water
Analysis Batch: 174515

Client Sample ID: FC-CCR-MW62-4119
Prep Type: Total/NA
Prep Batch: 174224

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	2.0		1.00	2.80		mg/L		80	70 - 130
Calcium	530	M3	21.0	508	M3	mg/L		-120	70 - 130
Magnesium	350	M3	21.0	340	M3	mg/L		-35	70 - 130
Potassium	9.5		20.0	29.4		mg/L		99	70 - 130
Sodium	690	M3	20.0	661	M3	mg/L		-141	70 - 130

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: 550-120435-1 MSD
Matrix: Water
Analysis Batch: 174515

Client Sample ID: FC-CCR-MW62-4119
Prep Type: Total/NA
Prep Batch: 174224

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	2.0		1.00	2.89		mg/L		89	70 - 130	3	20
Calcium	530	M3	21.0	513	M3	mg/L		-99	70 - 130	1	20
Magnesium	350	M3	21.0	338	M3	mg/L		-43	70 - 130	0	20
Potassium	9.5		20.0	29.3		mg/L		99	70 - 130	0	20
Sodium	690	M3	20.0	649	M3	mg/L		-201	70 - 130	2	20

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 550-174785/1-A
Matrix: Wipe
Analysis Batch: 175051

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 174785

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		50		ug/Wipe		04/12/19 05:30	04/16/19 02:16	1

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 550-174586/1
Matrix: Water
Analysis Batch: 174586

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

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	ND		6.0		mg/L			04/10/19 13:40	1
Bicarbonate Alkalinity as CaCO3	ND		6.0		mg/L			04/10/19 13:40	1

Lab Sample ID: MB 550-174586/28
Matrix: Water
Analysis Batch: 174586

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

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	ND		6.0		mg/L			04/10/19 13:40	1
Bicarbonate Alkalinity as CaCO3	ND		6.0		mg/L			04/10/19 13:40	1

Lab Sample ID: LCS 550-174586/2
Matrix: Water
Analysis Batch: 174586

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity as CaCO3	250	250		mg/L		100	90 - 110

Lab Sample ID: LCS 550-174586/27
Matrix: Water
Analysis Batch: 174586

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity as CaCO3	250	256		mg/L		102	90 - 110

Method: SM 2320B - Alkalinity (Continued)

Lab Sample ID: LCSD 550-174586/14
Matrix: Water
Analysis Batch: 174586

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Alkalinity as CaCO3			250	254		mg/L		102	90 - 110	2	20

Lab Sample ID: LCSD 550-174586/34
Matrix: Water
Analysis Batch: 174586

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Alkalinity as CaCO3			250	258		mg/L		103	90 - 110	1	20

Lab Sample ID: 550-120435-1 DU
Matrix: Water
Analysis Batch: 174586

Client Sample ID: FC-CCR-MW62-4119
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Alkalinity as CaCO3	690			690		mg/L				0.3	20
Bicarbonate Alkalinity as CaCO3	690			690		mg/L				0.3	20

Lab Sample ID: 550-120435-11 DU
Matrix: Water
Analysis Batch: 174586

Client Sample ID: FC-CCR-SW6-4119
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Alkalinity as CaCO3	130			122		mg/L				5	20
Bicarbonate Alkalinity as CaCO3	130			122		mg/L				5	20

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

Lab Sample ID: MB 550-174008/1
Matrix: Water
Analysis Batch: 174008

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		20		mg/L			04/04/19 11:55	1

Lab Sample ID: LCS 550-174008/2
Matrix: Water
Analysis Batch: 174008

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Dissolved Solids			1000	978		mg/L		98	90 - 110		

Lab Sample ID: LCSD 550-174008/3
Matrix: Water
Analysis Batch: 174008

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids			1000	996		mg/L		100	90 - 110	2	10

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

Lab Sample ID: 550-120430-A-2 DU
Matrix: Water
Analysis Batch: 174008

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	7700	D2		7440	D2	mg/L				4	10

Lab Sample ID: 550-120435-1 DU
Matrix: Water
Analysis Batch: 174008

Client Sample ID: FC-CCR-MW62-4119
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	5500	D2		5630	D2	mg/L				2	10

Method: SM 4500 H+ B - pH

Lab Sample ID: LCSSRM 550-174550/1
Matrix: Water
Analysis Batch: 174550

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

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.0		SU		99.4	98.5 - 101.5		

Lab Sample ID: LCSSRM 550-174550/12
Matrix: Water
Analysis Batch: 174550

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

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.1		SU		100.7	98.5 - 101.5		

Lab Sample ID: LCSSRM 550-174550/23
Matrix: Water
Analysis Batch: 174550

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

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.1		SU		100.9	98.5 - 101.5		

Lab Sample ID: 550-120275-E-1 DU
Matrix: Water
Analysis Batch: 174550

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	8.3	H5		8.3	H5	SU				0.1	5

Lab Sample ID: 550-120435-1 DU
Matrix: Water
Analysis Batch: 174550

Client Sample ID: FC-CCR-MW62-4119
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	7.1	H5		7.1	H5	SU				0.1	5

HPLC/IC

Analysis Batch: 174235

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-120435-1	FC-CCR-MW62-4119	Total/NA	Water	300.0	
550-120435-1	FC-CCR-MW62-4119	Total/NA	Water	300.0	
550-120435-2	FC-CCR-MW63-4119	Total/NA	Water	300.0	
550-120435-2	FC-CCR-MW63-4119	Total/NA	Water	300.0	
550-120435-3	FC-CCR-MW64-4119	Total/NA	Water	300.0	
550-120435-4	FC-CCR-MW65-4119	Total/NA	Water	300.0	
550-120435-4	FC-CCR-MW65-4119	Total/NA	Water	300.0	
550-120435-5	FC-CCR-FD1-4119	Total/NA	Water	300.0	
550-120435-5	FC-CCR-FD1-4119	Total/NA	Water	300.0	
550-120435-6	FC-CCR-SW1-4119	Total/NA	Water	300.0	
550-120435-6	FC-CCR-SW1-4119	Total/NA	Water	300.0	
550-120435-7	FC-CCR-SW2-4119	Total/NA	Water	300.0	
550-120435-7	FC-CCR-SW2-4119	Total/NA	Water	300.0	
550-120435-8	FC-CCR-SW3-4119	Total/NA	Water	300.0	
550-120435-8	FC-CCR-SW3-4119	Total/NA	Water	300.0	
550-120435-9	FC-CCR-SW4-4119	Total/NA	Water	300.0	
550-120435-9	FC-CCR-SW4-4119	Total/NA	Water	300.0	
550-120435-10	FC-CCR-SW5-4119	Total/NA	Water	300.0	
550-120435-10	FC-CCR-SW5-4119	Total/NA	Water	300.0	
550-120435-11	FC-CCR-SW6-4119	Total/NA	Water	300.0	
550-120435-11	FC-CCR-SW6-4119	Total/NA	Water	300.0	
MB 550-174235/2	Method Blank	Total/NA	Water	300.0	
LCS 550-174235/5	Lab Control Sample	Total/NA	Water	300.0	
LCSD 550-174235/6	Lab Control Sample Dup	Total/NA	Water	300.0	
550-120435-1 MS	FC-CCR-MW62-4119	Total/NA	Water	300.0	
550-120435-1 MS	FC-CCR-MW62-4119	Total/NA	Water	300.0	
550-120435-1 MSD	FC-CCR-MW62-4119	Total/NA	Water	300.0	
550-120435-1 MSD	FC-CCR-MW62-4119	Total/NA	Water	300.0	

Analysis Batch: 174396

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-120435-3	FC-CCR-MW64-4119	Total/NA	Water	300.0	
MB 550-174396/2	Method Blank	Total/NA	Water	300.0	
LCS 550-174396/5	Lab Control Sample	Total/NA	Water	300.0	
LCSD 550-174396/6	Lab Control Sample Dup	Total/NA	Water	300.0	
550-120553-A-1 MS	Matrix Spike	Total/NA	Water	300.0	
550-120553-A-1 MS ^10	Matrix Spike	Total/NA	Water	300.0	
550-120553-A-1 MSD	Matrix Spike Duplicate	Total/NA	Water	300.0	
550-120553-A-1 MSD ^10	Matrix Spike Duplicate	Total/NA	Water	300.0	

Leach Batch: 174463

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-120435-13	FC-CCR-SWF-MW62-4119	Soluble	Wipe	DI Leach	
550-120435-15	FC-CCR-SWF-MW63-4119	Soluble	Wipe	DI Leach	
550-120435-17	FC-CCR-SWF-MW64-4119	Soluble	Wipe	DI Leach	
550-120435-19	FC-CCR-SWF-MW65-4119	Soluble	Wipe	DI Leach	
550-120435-20	FC-CCR-Swipeblank-4119	Soluble	Wipe	DI Leach	
MB 550-174463/1-A	Method Blank	Soluble	Wipe	DI Leach	
LCS 550-174463/2-A	Lab Control Sample	Soluble	Wipe	DI Leach	
LCSD 550-174463/3-A	Lab Control Sample Dup	Soluble	Wipe	DI Leach	

HPLC/IC

Analysis Batch: 174533

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-120435-13	FC-CCR-SWF-MW62-4119	Soluble	Wipe	9056A	174463
550-120435-15	FC-CCR-SWF-MW63-4119	Soluble	Wipe	9056A	174463
550-120435-17	FC-CCR-SWF-MW64-4119	Soluble	Wipe	9056A	174463
550-120435-19	FC-CCR-SWF-MW65-4119	Soluble	Wipe	9056A	174463
550-120435-20	FC-CCR-Swipeblank-4119	Soluble	Wipe	9056A	174463
MB 550-174463/1-A	Method Blank	Soluble	Wipe	9056A	174463
LCS 550-174463/2-A	Lab Control Sample	Soluble	Wipe	9056A	174463
LCSD 550-174463/3-A	Lab Control Sample Dup	Soluble	Wipe	9056A	174463

Metals

Prep Batch: 173948

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-120435-2	FC-CCR-MW63-4119	Total/NA	Water	200.7	
550-120435-3	FC-CCR-MW64-4119	Total/NA	Water	200.7	
550-120435-4	FC-CCR-MW65-4119	Total/NA	Water	200.7	
550-120435-5	FC-CCR-FD1-4119	Total/NA	Water	200.7	
550-120435-6	FC-CCR-SW1-4119	Total/NA	Water	200.7	
550-120435-7	FC-CCR-SW2-4119	Total/NA	Water	200.7	
550-120435-8	FC-CCR-SW3-4119	Total/NA	Water	200.7	
550-120435-9	FC-CCR-SW4-4119	Total/NA	Water	200.7	
550-120435-10	FC-CCR-SW5-4119	Total/NA	Water	200.7	
550-120435-11	FC-CCR-SW6-4119	Total/NA	Water	200.7	
MB 550-173948/1-A	Method Blank	Total/NA	Water	200.7	
LCS 550-173948/3-A	Lab Control Sample	Total/NA	Water	200.7	
LCSD 550-173948/4-A	Lab Control Sample Dup	Total/NA	Water	200.7	
550-120327-C-1-A MS ^T	Matrix Spike	Total/NA	Water	200.7	
550-120327-C-1-B MSD ^T	Matrix Spike Duplicate	Total/NA	Water	200.7	

Prep Batch: 174224

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-120435-1	FC-CCR-MW62-4119	Total/NA	Water	200.7	
MB 550-174224/1-A	Method Blank	Total/NA	Water	200.7	
LCS 550-174224/3-A	Lab Control Sample	Total/NA	Water	200.7	
LCSD 550-174224/4-A	Lab Control Sample Dup	Total/NA	Water	200.7	
550-120435-1 MS	FC-CCR-MW62-4119	Total/NA	Water	200.7	
550-120435-1 MSD	FC-CCR-MW62-4119	Total/NA	Water	200.7	

Analysis Batch: 174515

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-120435-1	FC-CCR-MW62-4119	Total/NA	Water	200.7 Rev 4.4	174224
MB 550-174224/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	174224
LCS 550-174224/3-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	174224
LCSD 550-174224/4-A	Lab Control Sample Dup	Total/NA	Water	200.7 Rev 4.4	174224
550-120435-1 MS	FC-CCR-MW62-4119	Total/NA	Water	200.7 Rev 4.4	174224
550-120435-1 MSD	FC-CCR-MW62-4119	Total/NA	Water	200.7 Rev 4.4	174224

Analysis Batch: 174517

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-120435-2	FC-CCR-MW63-4119	Total/NA	Water	200.7 Rev 4.4	173948
550-120435-3	FC-CCR-MW64-4119	Total/NA	Water	200.7 Rev 4.4	173948

Metals (Continued)

Analysis Batch: 174517 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-120435-4	FC-CCR-MW65-4119	Total/NA	Water	200.7 Rev 4.4	173948
550-120435-5	FC-CCR-FD1-4119	Total/NA	Water	200.7 Rev 4.4	173948
550-120435-6	FC-CCR-SW1-4119	Total/NA	Water	200.7 Rev 4.4	173948
550-120435-7	FC-CCR-SW2-4119	Total/NA	Water	200.7 Rev 4.4	173948
550-120435-8	FC-CCR-SW3-4119	Total/NA	Water	200.7 Rev 4.4	173948
550-120435-9	FC-CCR-SW4-4119	Total/NA	Water	200.7 Rev 4.4	173948
550-120435-10	FC-CCR-SW5-4119	Total/NA	Water	200.7 Rev 4.4	173948
550-120435-11	FC-CCR-SW6-4119	Total/NA	Water	200.7 Rev 4.4	173948
MB 550-173948/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	173948
LCS 550-173948/3-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	173948
LCSD 550-173948/4-A	Lab Control Sample Dup	Total/NA	Water	200.7 Rev 4.4	173948
550-120327-C-1-A MS ^T	Matrix Spike	Total/NA	Water	200.7 Rev 4.4	173948
550-120327-C-1-B MSD ^T	Matrix Spike Duplicate	Total/NA	Water	200.7 Rev 4.4	173948

Prep Batch: 174785

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-120435-12	FC-CCR-SWB-MW62-4119	Total/NA	Wipe	3050B	
550-120435-14	FC-CCR-SWB-MW63-4119	Total/NA	Wipe	3050B	
550-120435-16	FC-CCR-SWB-MW64-4119	Total/NA	Wipe	3050B	
550-120435-18	FC-CCR-SWB-MW65-4119	Total/NA	Wipe	3050B	
MB 550-174785/1-A	Method Blank	Total/NA	Wipe	3050B	
LCS 550-174785/2-A	Lab Control Sample	Total/NA	Wipe	3050B	
LCSD 550-174785/3-A	Lab Control Sample Dup	Total/NA	Wipe	3050B	

Analysis Batch: 175051

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-120435-12	FC-CCR-SWB-MW62-4119	Total/NA	Wipe	6010C	174785
550-120435-14	FC-CCR-SWB-MW63-4119	Total/NA	Wipe	6010C	174785
550-120435-16	FC-CCR-SWB-MW64-4119	Total/NA	Wipe	6010C	174785
550-120435-18	FC-CCR-SWB-MW65-4119	Total/NA	Wipe	6010C	174785
MB 550-174785/1-A	Method Blank	Total/NA	Wipe	6010C	174785
LCS 550-174785/2-A	Lab Control Sample	Total/NA	Wipe	6010C	174785
LCSD 550-174785/3-A	Lab Control Sample Dup	Total/NA	Wipe	6010C	174785

General Chemistry

Analysis Batch: 174008

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-120435-1	FC-CCR-MW62-4119	Total/NA	Water	SM 2540C	
550-120435-2	FC-CCR-MW63-4119	Total/NA	Water	SM 2540C	
550-120435-3	FC-CCR-MW64-4119	Total/NA	Water	SM 2540C	
550-120435-4	FC-CCR-MW65-4119	Total/NA	Water	SM 2540C	
550-120435-5	FC-CCR-FD1-4119	Total/NA	Water	SM 2540C	
550-120435-6	FC-CCR-SW1-4119	Total/NA	Water	SM 2540C	
550-120435-7	FC-CCR-SW2-4119	Total/NA	Water	SM 2540C	
550-120435-8	FC-CCR-SW3-4119	Total/NA	Water	SM 2540C	
550-120435-9	FC-CCR-SW4-4119	Total/NA	Water	SM 2540C	
550-120435-10	FC-CCR-SW5-4119	Total/NA	Water	SM 2540C	
550-120435-11	FC-CCR-SW6-4119	Total/NA	Water	SM 2540C	
MB 550-174008/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 550-174008/2	Lab Control Sample	Total/NA	Water	SM 2540C	

General Chemistry (Continued)

Analysis Batch: 174008 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 550-174008/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	
550-120430-A-2 DU	Duplicate	Total/NA	Water	SM 2540C	
550-120435-1 DU	FC-CCR-MW62-4119	Total/NA	Water	SM 2540C	

Analysis Batch: 174550

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-120435-1	FC-CCR-MW62-4119	Total/NA	Water	SM 4500 H+ B	
550-120435-2	FC-CCR-MW63-4119	Total/NA	Water	SM 4500 H+ B	
550-120435-3	FC-CCR-MW64-4119	Total/NA	Water	SM 4500 H+ B	
550-120435-4	FC-CCR-MW65-4119	Total/NA	Water	SM 4500 H+ B	
550-120435-5	FC-CCR-FD1-4119	Total/NA	Water	SM 4500 H+ B	
550-120435-6	FC-CCR-SW1-4119	Total/NA	Water	SM 4500 H+ B	
550-120435-7	FC-CCR-SW2-4119	Total/NA	Water	SM 4500 H+ B	
550-120435-8	FC-CCR-SW3-4119	Total/NA	Water	SM 4500 H+ B	
550-120435-9	FC-CCR-SW4-4119	Total/NA	Water	SM 4500 H+ B	
550-120435-10	FC-CCR-SW5-4119	Total/NA	Water	SM 4500 H+ B	
550-120435-11	FC-CCR-SW6-4119	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-174550/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-174550/12	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-174550/23	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
550-120275-E-1 DU	Duplicate	Total/NA	Water	SM 4500 H+ B	
550-120435-1 DU	FC-CCR-MW62-4119	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 174586

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-120435-1	FC-CCR-MW62-4119	Total/NA	Water	SM 2320B	
550-120435-2	FC-CCR-MW63-4119	Total/NA	Water	SM 2320B	
550-120435-3	FC-CCR-MW64-4119	Total/NA	Water	SM 2320B	
550-120435-4	FC-CCR-MW65-4119	Total/NA	Water	SM 2320B	
550-120435-5	FC-CCR-FD1-4119	Total/NA	Water	SM 2320B	
550-120435-6	FC-CCR-SW1-4119	Total/NA	Water	SM 2320B	
550-120435-7	FC-CCR-SW2-4119	Total/NA	Water	SM 2320B	
550-120435-8	FC-CCR-SW3-4119	Total/NA	Water	SM 2320B	
550-120435-9	FC-CCR-SW4-4119	Total/NA	Water	SM 2320B	
550-120435-10	FC-CCR-SW5-4119	Total/NA	Water	SM 2320B	
550-120435-11	FC-CCR-SW6-4119	Total/NA	Water	SM 2320B	
MB 550-174586/1	Method Blank	Total/NA	Water	SM 2320B	
MB 550-174586/28	Method Blank	Total/NA	Water	SM 2320B	
LCS 550-174586/2	Lab Control Sample	Total/NA	Water	SM 2320B	
LCS 550-174586/27	Lab Control Sample	Total/NA	Water	SM 2320B	
LCSD 550-174586/14	Lab Control Sample Dup	Total/NA	Water	SM 2320B	
LCSD 550-174586/34	Lab Control Sample Dup	Total/NA	Water	SM 2320B	
550-120435-1 DU	FC-CCR-MW62-4119	Total/NA	Water	SM 2320B	
550-120435-11 DU	FC-CCR-SW6-4119	Total/NA	Water	SM 2320B	

Lab Chronicle

Client: Wood E&I Solutions Inc
Project/Site: APS Sampling

Job ID: 550-120435-1

Client Sample ID: FC-CCR-MW62-4119

Lab Sample ID: 550-120435-1

Date Collected: 04/01/19 10:30

Matrix: Water

Date Received: 04/03/19 15:56

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	174235	04/05/19 18:43	NEL	TAL PHX
Total/NA	Analysis	300.0		200	174235	04/05/19 19:10	NEL	TAL PHX
Total/NA	Prep	200.7			174224	04/08/19 08:55	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	174515	04/09/19 16:49	SRA	TAL PHX
Total/NA	Analysis	SM 2320B		1	174586	04/10/19 13:40	DGS	TAL PHX
Total/NA	Analysis	SM 2540C		1	174008		YET	TAL PHX
					(Start)	04/04/19 11:55		
					(End)	04/05/19 09:55		
Total/NA	Analysis	SM 4500 H+ B		1	174550	04/10/19 11:45	MRR	TAL PHX

Client Sample ID: FC-CCR-MW63-4119

Lab Sample ID: 550-120435-2

Date Collected: 04/01/19 09:39

Matrix: Water

Date Received: 04/03/19 15:56

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	174235	04/05/19 19:38	NEL	TAL PHX
Total/NA	Analysis	300.0		200	174235	04/05/19 20:05	NEL	TAL PHX
Total/NA	Prep	200.7			173948	04/03/19 22:28	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	174517	04/09/19 20:31	SRA	TAL PHX
Total/NA	Analysis	SM 2320B		1	174586	04/10/19 13:40	DGS	TAL PHX
Total/NA	Analysis	SM 2540C		1	174008		YET	TAL PHX
					(Start)	04/04/19 11:55		
					(End)	04/05/19 09:55		
Total/NA	Analysis	SM 4500 H+ B		1	174550	04/10/19 11:45	MRR	TAL PHX

Client Sample ID: FC-CCR-MW64-4119

Lab Sample ID: 550-120435-3

Date Collected: 04/01/19 12:00

Matrix: Water

Date Received: 04/03/19 15:56

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		10	174396	04/08/19 18:30	NEL	TAL PHX
Total/NA	Analysis	300.0		1	174235	04/05/19 20:33	NEL	TAL PHX
Total/NA	Prep	200.7			173948	04/03/19 22:28	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	174517	04/09/19 20:37	SRA	TAL PHX
Total/NA	Analysis	SM 2320B		1	174586	04/10/19 13:40	DGS	TAL PHX
Total/NA	Analysis	SM 2540C		1	174008		YET	TAL PHX
					(Start)	04/04/19 11:55		
					(End)	04/05/19 09:55		
Total/NA	Analysis	SM 4500 H+ B		1	174550	04/10/19 11:45	MRR	TAL PHX

Lab Chronicle

Client: Wood E&I Solutions Inc
Project/Site: APS Sampling

Job ID: 550-120435-1

Client Sample ID: FC-CCR-MW65-4119

Lab Sample ID: 550-120435-4

Date Collected: 04/01/19 11:10

Matrix: Water

Date Received: 04/03/19 15:56

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	174235	04/05/19 21:27	NEL	TAL PHX
Total/NA	Analysis	300.0		10	174235	04/05/19 21:55	NEL	TAL PHX
Total/NA	Prep	200.7			173948	04/03/19 22:28	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	174517	04/09/19 20:45	SRA	TAL PHX
Total/NA	Analysis	SM 2320B		1	174586	04/10/19 13:40	DGS	TAL PHX
Total/NA	Analysis	SM 2540C		1	174008		YET	TAL PHX
					(Start)	04/04/19 11:55		
					(End)	04/05/19 09:55		
Total/NA	Analysis	SM 4500 H+ B		1	174550	04/10/19 11:45	MRR	TAL PHX

Client Sample ID: FC-CCR-FD1-4119

Lab Sample ID: 550-120435-5

Date Collected: 04/01/19 09:39

Matrix: Water

Date Received: 04/03/19 15:56

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	174235	04/05/19 22:22	NEL	TAL PHX
Total/NA	Analysis	300.0		10	174235	04/05/19 22:50	NEL	TAL PHX
Total/NA	Prep	200.7			173948	04/03/19 22:28	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	174517	04/09/19 20:48	SRA	TAL PHX
Total/NA	Analysis	SM 2320B		1	174586	04/10/19 13:40	DGS	TAL PHX
Total/NA	Analysis	SM 2540C		1	174008		YET	TAL PHX
					(Start)	04/04/19 11:55		
					(End)	04/05/19 09:55		
Total/NA	Analysis	SM 4500 H+ B		1	174550	04/10/19 11:45	MRR	TAL PHX

Client Sample ID: FC-CCR-SW1-4119

Lab Sample ID: 550-120435-6

Date Collected: 04/01/19 15:08

Matrix: Water

Date Received: 04/03/19 15:56

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	174235	04/06/19 02:02	NEL	TAL PHX
Total/NA	Analysis	300.0		10	174235	04/06/19 02:29	NEL	TAL PHX
Total/NA	Prep	200.7			173948	04/03/19 22:28	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	174517	04/09/19 20:51	SRA	TAL PHX
Total/NA	Analysis	SM 2320B		1	174586	04/10/19 13:40	DGS	TAL PHX
Total/NA	Analysis	SM 2540C		1	174008		YET	TAL PHX
					(Start)	04/04/19 11:55		
					(End)	04/05/19 09:55		
Total/NA	Analysis	SM 4500 H+ B		1	174550	04/10/19 11:45	MRR	TAL PHX

Lab Chronicle

Client: Wood E&I Solutions Inc
Project/Site: APS Sampling

Job ID: 550-120435-1

Client Sample ID: FC-CCR-SW2-4119

Lab Sample ID: 550-120435-7

Date Collected: 04/01/19 16:39

Matrix: Water

Date Received: 04/03/19 15:56

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	174235	04/06/19 02:56	NEL	TAL PHX
Total/NA	Analysis	300.0		10	174235	04/06/19 03:24	NEL	TAL PHX
Total/NA	Prep	200.7			173948	04/03/19 22:28	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	174517	04/09/19 20:54	SRA	TAL PHX
Total/NA	Analysis	SM 2320B		1	174586	04/10/19 13:40	DGS	TAL PHX
Total/NA	Analysis	SM 2540C		1	174008		YET	TAL PHX
					(Start)	04/04/19 11:55		
					(End)	04/05/19 09:55		
Total/NA	Analysis	SM 4500 H+ B		1	174550	04/10/19 11:45	MRR	TAL PHX

Client Sample ID: FC-CCR-SW3-4119

Lab Sample ID: 550-120435-8

Date Collected: 04/01/19 12:13

Matrix: Water

Date Received: 04/03/19 15:56

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	174235	04/06/19 03:51	NEL	TAL PHX
Total/NA	Analysis	300.0		10	174235	04/06/19 04:19	NEL	TAL PHX
Total/NA	Prep	200.7			173948	04/03/19 22:28	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	174517	04/09/19 20:56	SRA	TAL PHX
Total/NA	Analysis	SM 2320B		1	174586	04/10/19 13:40	DGS	TAL PHX
Total/NA	Analysis	SM 2540C		1	174008		YET	TAL PHX
					(Start)	04/04/19 11:55		
					(End)	04/05/19 09:55		
Total/NA	Analysis	SM 4500 H+ B		1	174550	04/10/19 11:45	MRR	TAL PHX

Client Sample ID: FC-CCR-SW4-4119

Lab Sample ID: 550-120435-9

Date Collected: 04/01/19 13:37

Matrix: Water

Date Received: 04/03/19 15:56

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	174235	04/06/19 05:41	NEL	TAL PHX
Total/NA	Analysis	300.0		10	174235	04/06/19 06:08	NEL	TAL PHX
Total/NA	Prep	200.7			173948	04/03/19 22:28	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	174517	04/09/19 20:59	SRA	TAL PHX
Total/NA	Analysis	SM 2320B		1	174586	04/10/19 13:40	DGS	TAL PHX
Total/NA	Analysis	SM 2540C		1	174008		YET	TAL PHX
					(Start)	04/04/19 11:55		
					(End)	04/05/19 09:55		
Total/NA	Analysis	SM 4500 H+ B		1	174550	04/10/19 11:45	MRR	TAL PHX

Lab Chronicle

Client: Wood E&I Solutions Inc
Project/Site: APS Sampling

Job ID: 550-120435-1

Client Sample ID: FC-CCR-SW5-4119

Lab Sample ID: 550-120435-10

Date Collected: 04/01/19 11:23

Matrix: Water

Date Received: 04/03/19 15:56

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	174235	04/06/19 06:36	NEL	TAL PHX
Total/NA	Analysis	300.0		10	174235	04/06/19 07:03	NEL	TAL PHX
Total/NA	Prep	200.7			173948	04/03/19 22:28	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	174517	04/09/19 21:02	SRA	TAL PHX
Total/NA	Analysis	SM 2320B		1	174586	04/10/19 13:40	DGS	TAL PHX
Total/NA	Analysis	SM 2540C		1	174008		YET	TAL PHX
					(Start)	04/04/19 11:55		
					(End)	04/05/19 09:55		
Total/NA	Analysis	SM 4500 H+ B		1	174550	04/10/19 11:45	MRR	TAL PHX

Client Sample ID: FC-CCR-SW6-4119

Lab Sample ID: 550-120435-11

Date Collected: 04/01/19 15:26

Matrix: Water

Date Received: 04/03/19 15:56

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	174235	04/06/19 11:10	NEL	TAL PHX
Total/NA	Analysis	300.0		10	174235	04/06/19 11:37	NEL	TAL PHX
Total/NA	Prep	200.7			173948	04/03/19 22:28	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	174517	04/09/19 21:05	SRA	TAL PHX
Total/NA	Analysis	SM 2320B		1	174586	04/10/19 13:40	DGS	TAL PHX
Total/NA	Analysis	SM 2540C		1	174008		YET	TAL PHX
					(Start)	04/04/19 11:55		
					(End)	04/05/19 09:55		
Total/NA	Analysis	SM 4500 H+ B		1	174550	04/10/19 11:45	MRR	TAL PHX

Client Sample ID: FC-CCR-SWB-MW62-4119

Lab Sample ID: 550-120435-12

Date Collected: 04/01/19 10:06

Matrix: Wipe

Date Received: 04/03/19 15:56

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			174785	04/12/19 05:30	SGO	TAL PHX
Total/NA	Analysis	6010C		1	175051	04/16/19 02:24	SRA	TAL PHX

Client Sample ID: FC-CCR-SWF-MW62-4119

Lab Sample ID: 550-120435-13

Date Collected: 04/01/19 10:06

Matrix: Wipe

Date Received: 04/03/19 15:56

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Soluble	Leach	DI Leach			174463	04/09/19 18:00	NEL	TAL PHX
Soluble	Analysis	9056A		1	174533	04/09/19 21:46	NEL	TAL PHX

Lab Chronicle

Client: Wood E&I Solutions Inc
Project/Site: APS Sampling

Job ID: 550-120435-1

Client Sample ID: FC-CCR-SWB-MW63-4119
Lab Sample ID: 550-120435-14
Date Collected: 04/01/19 11:37
Matrix: Wipe
Date Received: 04/03/19 15:56

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			174785	04/12/19 05:30	SGO	TAL PHX
Total/NA	Analysis	6010C		1	175051	04/16/19 02:27	SRA	TAL PHX

Client Sample ID: FC-CCR-SWF-MW63-4119
Lab Sample ID: 550-120435-15
Date Collected: 04/01/19 11:37
Matrix: Wipe
Date Received: 04/03/19 15:56

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Soluble	Leach	DI Leach			174463	04/09/19 18:00	NEL	TAL PHX
Soluble	Analysis	9056A		1	174533	04/09/19 22:04	NEL	TAL PHX

Client Sample ID: FC-CCR-SWB-MW64-4119
Lab Sample ID: 550-120435-16
Date Collected: 04/01/19 04:10
Matrix: Wipe
Date Received: 04/03/19 15:56

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			174785	04/12/19 05:30	SGO	TAL PHX
Total/NA	Analysis	6010C		1	175051	04/16/19 02:32	SRA	TAL PHX

Client Sample ID: FC-CCR-SWF-MW64-4119
Lab Sample ID: 550-120435-17
Date Collected: 04/01/19 10:51
Matrix: Wipe
Date Received: 04/03/19 15:56

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Soluble	Leach	DI Leach			174463	04/09/19 18:00	NEL	TAL PHX
Soluble	Analysis	9056A		1	174533	04/09/19 22:23	NEL	TAL PHX

Client Sample ID: FC-CCR-SWB-MW65-4119
Lab Sample ID: 550-120435-18
Date Collected: 04/01/19 09:05
Matrix: Wipe
Date Received: 04/03/19 15:56

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			174785	04/12/19 05:30	SGO	TAL PHX
Total/NA	Analysis	6010C		1	175051	04/16/19 02:35	SRA	TAL PHX

Client Sample ID: FC-CCR-SWF-MW65-4119
Lab Sample ID: 550-120435-19
Date Collected: 04/01/19 09:05
Matrix: Wipe
Date Received: 04/03/19 15:56

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Soluble	Leach	DI Leach			174463	04/09/19 18:00	NEL	TAL PHX
Soluble	Analysis	9056A		1	174533	04/09/19 22:41	NEL	TAL PHX

Lab Chronicle

Client: Wood E&I Solutions Inc
Project/Site: APS Sampling

Job ID: 550-120435-1

Client Sample ID: FC-CCR-Swipeblank-4119

Lab Sample ID: 550-120435-20

Date Collected: 04/01/19 09:05

Matrix: Wipe

Date Received: 04/03/19 15:56

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Soluble	Leach	DI Leach			174463	04/09/19 18:00	NEL	TAL PHX
Soluble	Analysis	9056A		1	174533	04/09/19 21:28	NEL	TAL PHX

Laboratory References:

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

Accreditation/Certification Summary

Client: Wood E&I Solutions Inc
Project/Site: APS Sampling

Job ID: 550-120435-1

Laboratory: Eurofins TestAmerica, Phoenix

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Arizona	State Program	9	AZ0728	06-09-19

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
200.7 Rev 4.4	200.7	Water	Boron
200.7 Rev 4.4	200.7	Water	Potassium
6010C	3050B	Wipe	Boron
9056A		Wipe	Fluoride

Method Summary

Client: Wood E&I Solutions Inc
Project/Site: APS Sampling

Job ID: 550-120435-1

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL PHX
9056A	Anions, Ion Chromatography	SW846	TAL PHX
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PHX
6010C	Metals (ICP)	SW846	TAL PHX
SM 2320B	Alkalinity	SM	TAL PHX
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PHX
SM 4500 H+ B	pH	SM	TAL PHX
200.7	Preparation, Total Metals	EPA	TAL PHX
3050B	Preparation, Metals	SW846	TAL PHX
DI Leach	Deionized Water Leaching Procedure	ASTM	TAL PHX

Protocol References:

ASTM = ASTM International
EPA = US Environmental Protection Agency
MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
SM = "Standard Methods For The Examination Of Water And Wastewater"
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

TestAmerica Phoenix
625 E Cotton Center Blvd, Ste. 189
Phoenix, AZ 85040
Phone (602) 437-3340 Fax (623) 445-6192

120435

Chain of Custody Record

550-120435 Chain of Custody

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Doug Lavarnway	Lab PM: Rachel Sester	OC No:
Client Contact: Natalie Chrisman	Phone: (928) 288-1394	E-Mail: Rachel.Sester@testamericainc.com	Page: 1 of 2
Company: Wood - Environment & Infrastructure Solutions, Inc.	Site Contact: Natalie Chrisman (602) 316-1324		Job #:
Address: 4600 E. Washington St., Suite 600	Due Date Requested:		
City: Phoenix	TAT Requested (days): 7 Days		
State, Zip: AZ 85034	PO #:		
Phone: (602) 733-6000	WO #:		
Email: natalie.chrisman@woodplc.com	Project #: 1420182068.****.3		
Project Name: CWTP ASD Sampling Event	SSOW#:		
Site: APS FC PP			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EPA 200.7 (B, Ca, Mg, K, & Na)	EPA 300.0 (Cl, F, NO3, NO2, & SO4)	SM 2320B (Bicarbonate Alkalinity)	SM 2540C (TDS)	SM 4500-HB (pH)	Total Number of containers	Special Instructions/Note:
			Preservation Code:										
FC - CCR - MW62 - 4119 -01	4/1/19	1030	G	W	N	N	X	X	X	X	X	2	
FC - CCR - MW63 - 4119 -02	4/1/19	939	G	W	N	N	X	X	X	X	X	2	
FC - CCR - MW64 - 4119 -03	4/1/19	1200	G	W	N	N	X	X	X	X	X	2	
FC - CCR - MW65 - 4119 -04	4/1/19	1110	G	W	N	N	X	X	X	X	X	2	
FC - CCR - FD1 - 4119 -05	4/1/19	939	G	W	N	N	X	X	X	X	X	2	
FC - CCR - SW1 - 4119 -06	4/1/19	1508	G	W	N	N	X	X	X	X	X	2	
FC - CCR - SW2 - 4119 -07	4/1/19	1639	G	W	N	N	X	X	X	X	X	2	
FC - CCR - SW3 - 4119 -08	4/1/19	1213	G	W	N	N	X	X	X	X	X	2	
FC - CCR - SW4 - 4119 -09	4/1/19	1337	G	W	N	N	X	X	X	X	X	2	
FC - CCR - SW5 - 4119 -10	4/1/19	1123	G	W	N	N	X	X	X	X	X	2	
FC - CCR - SW6 - 4119 -11	4/1/19	1526	G	W	N	N	X	X	X	X	X	2	
FC - CCR - SW7 - ~~-12~~ AG			G	W	N	N	X	X	X	X	X	2	

Possible Hazard Identification

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

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

☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements: There are 4 coolers that were shipped with this COC

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Doug Lavarnway	3/3/19 1556	APS			
Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Relinquished by	Date/Time	Company	Received by	Date/Time 4-3-19 1556	Company TAPHX

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: (2.2°C) PC

TestAmerica Denver
625 E Cotton Center Blvd, Ste. 189
Phoenix, AZ 85040
Phone (602) 437-3340 Fax (623) 445-6192

120435

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Doug Lavarnway	Lab PM: Rachel Sester	Carrier Tracking No(s):	COC No:
Client Contact: Natalie Chrisman	Phone: (928) 288-1394	E-Mail: Rachel.Sester@testamericainc.com		Page: 2 of 2
Company: Wood - Environment & Infrastructure Solutions, Inc.	Site Contact: Natalie Chrisman (602) 316-1324			Job #:

Address: 4600 E. Washington St., Suite 600	Due Date Requested:
City: Phoenix	TAT Requested (days): 7 Days
State, Zip: AZ 85034	PO #:
Phone: (602) 733-6000	WO #:
Email: natalie.chrisman@woodplc.com	Project #: 1420182068.****.3
Project Name: CWTP ASD Sampling Event	SSOW#:
Site: APS FC PP	

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EPA 9056 (F)	EPA 6010 (B)	Total Number of containers	Special Instructions/Note:
AG 4/3/19			Preservation Code:							
FC - CCR - SWB - MW62 - 4119 -13	4/1/19	1006	G	S	N	N		X	2	-12
FC - CCR - SWF - MW62 - 4119 -14	4/1/19	1006	G	S	N	N	X		2	-13
FC - CCR - SWB - MW63 - 4119 -15	4/1/19	1137	G	S	N	N		X	2	-14
FC - CCR - SWF - MW63 - 4119 -16	4/1/19	1137	G	S	N	N	X		2	-15
FC - CCR - SWB - MW64 - 4119 -17	4/1/19	1051	G	S	N	N		X	2	-16
FC - CCR - SWF - MW64 - 4119 -18	4/1/19	1051	G	S	N	N	X			17
FC - CCR - SWB - MW65 - 4119 -19	4/1/19	905	G	S	N	N		X		18
FC - CCR - SWF - MW65 - 4119 ~~-20~~	4/1/19	905	G	S	N	N	X			-19
FC - CCR - Swipeblank - 4119 -21	4/1/19	905	G	S	N	N	X	X		-20

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements: There are 4 coolers that were shipped with this COC

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by: Doug Lavarnway	Date/Time: 3/3/19 1555	Company: APS	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 4-3-19 1556	Company: APEX

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: (5.9°C) PC

Login Sample Receipt Checklist

Client: Wood E&I Solutions Inc

Job Number: 550-120435-1

Login Number: 120435
List Number: 1
Creator: Gravlin, Andrea

List Source: Eurofins TestAmerica, Phoenix

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

APPENDIX B

WELL AND TEST BORING LOGS

URS

Borehole: MW-62

PROJECT: FCCP Monitoring Well Install
CLIENT: APS
LOCATION: FCCP New Mexico
URS PROJECT #: 60437300

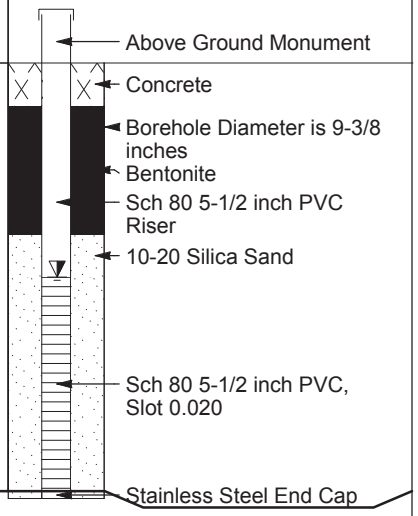
DRILLING METHOD: RotoSonic
LOGGED BY: Leah Wills
START DATE/TIME: 9/27/2015 3:05:00 PM
FINISH DATE/TIME: 9/28/2015 10:30:00 AM

Water Level at Drilling Completion (ft bgs): 10
Screened Interval (ft bgs): 10-20
COMMENTS:

COORDINATES (NM State):
North: 2071562.93
East: 2534532.68
TOP OF GROUND ELEVATION (NAVD88): 5339.37 feet A.S.L.

DEPTH (ft)	GRAPHIC LOG	Lithology Depth	MATERIAL DESCRIPTION
0		0.0	
			Silty Sand (SM), yellowish brown (10 YR 5/4), fine sand, medium dense, dry, moderate HCL reaction
			Silty Sand (SM), dark grayish brown (10 YR 4/2), fine sand, dense, moist, strong HCL reaction, some clay
10			Very dark gray (10 YR 3/1), with brown mottling
			Lean Clay with Sand (CL), dark gray (10 YR 4/1) with light brown mottling, fine sand, high plasticity, stiff, wet
20		20.0	

Total Depth of borehole = 20.0 feet bgs



URS

Borehole: MW-63

PROJECT: FCCP Monitoring Well Install
CLIENT: APS
LOCATION: FCCP New Mexico
URS PROJECT #: 60437300

DRILLING METHOD: RotoSonic
LOGGED BY: Leah Wills
START DATE/TIME: 9/25/2015 10:37:00 AM
FINISH DATE/TIME: 9/25/2015 1:30:00 PM

Water Level at Drilling Completion (ft bgs):9
Screened Interval (ft bgs): 9-19
COMMENTS:

COORDINATES (NM State):
North: 2071996.92
East: 2534981.78
TOP OF GROUND ELEVATION (NAVD88): 5337.02 feet A.S.L.

DEPTH (ft)	GRAPHIC LOG	Lithology Depth	MATERIAL DESCRIPTION	WELL INFORMATION
0				
			Sandy Clay (CL), dark yellowish brown (10 YR 4/4), fine to coarse sand, medium plasticity, soft, dry, strong HCL reaction	Flush Mount Cover Concrete Borehole Diameter is 9-3/8 inches Bentonite Sch 80 5-1/2 inch PVC Riser 10-20 Silica Sand
			Wet	
10			3" layer of coarse gravel at 10.5'	
				Sch 80 5-1/2 inch PVC, Slot 0.020
20		20.0		Stainless Steel End Cap

Total Depth of borehole = 20.0 feet bgs

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URS

Borehole: MW-64

PROJECT: FCCP Monitoring Well Install
CLIENT: APS
LOCATION: FCCP New Mexico
URS PROJECT #: 60437300

DRILLING METHOD: RotoSonic
LOGGED BY: Leah Wills
START DATE/TIME: 9/25/2015 3:30:00 PM
FINISH DATE/TIME: 9/26/2015 10:10:00 AM

Water Level at Drilling Completion (ft bgs):8.5
Screened Interval (ft bgs): 10-20
COMMENTS:

COORDINATES (NM State):
North: 2071564.57
East: 2535675.1
TOP OF GROUND ELEVATION (NAVD88): 5337.66 feet A.S.L.

DEPTH (ft)	GRAPHIC LOG	Lithology Depth	MATERIAL DESCRIPTION	WELL INFORMATION
0				
			0-5' airknifed, fill material, fine clayey sand (SC)	Flush Mount Cover Concrete Borehole Diameter is 9-3/8 inches Bentonite
10			Clayey Sand (SC), light olive brown (2.5 YR 5/4), fine sand, soft, moist, strong HCL reaction	Sch 80 5-1/2 inch PVC Riser 10-20 Silica Sand
			12'-14' olive gray (5 YR 5/2)	Sch 80 5-1/2 inch PVC, Slot 0.020
20			moist-wet	Stainless Steel End Cap
		25.0		Hole Cave

Total Depth of borehole = 25.0 feet bgs

URS

Borehole: MW-65

PROJECT: FCCP Monitoring Well Install
CLIENT: APS
LOCATION: FCCP New Mexico
URS PROJECT #: 60437300

DRILLING METHOD: RotoSonic
LOGGED BY: Leah Wills
START DATE/TIME: 9/27/2015 11:50:00 AM
FINISH DATE/TIME: 9/27/2015 2:30:00 PM

Water Level at Drilling Completion (ft bgs):8.98
Screened Interval (ft bgs): 8-18
COMMENTS:

COORDINATES (NM State):
North: 2071367.36
East: 2535315.81
TOP OF GROUND ELEVATION (NAVD88): 5337.24 feet A.S.L.

DEPTH (ft)	GRAPHIC LOG	Lithology Depth	MATERIAL DESCRIPTION	WELL INFORMATION
0				Above Ground Monument
			Silty Sand (SM), light olive brown (2.5 YR 5/4), fine sand, soft to medium dense, dry, slight HCL reaction	Concrete Borehole Diameter is 9-3/8 inches Bentonite Sch 80 5-1/2 inch PVC Riser
			5'-7.5' olive brown (2.5 YR 4/3)	
			7.5'-10' Dense	10-20 Silica Sand
10				
			Wet at 13'	Sch 80 5-1/2 inch PVC, Slot 0.020
				Stainless Steel End Cap
20		20.0		Hole Slough

Total Depth of borehole = 20.0 feet bgs

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URS

Borehole: MW-71

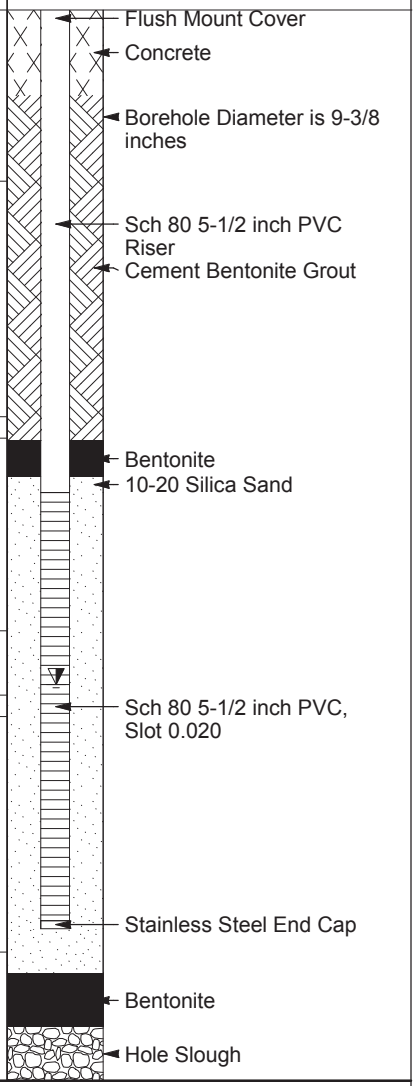
PROJECT: FCCP Monitoring Well Install
CLIENT: APS
LOCATION: FCCP New Mexico
URS PROJECT #: 60437300

DRILLING METHOD: RotoSonic
LOGGED BY: Rick Smith
START DATE/TIME: 2/29/2016 2:00:00 PM
FINISH DATE/TIME: 3/1/2016 12:50:00 PM

Water Level at Drilling Completion (ft bgs):31.5
Screened Interval (ft bgs): 22.54-42.54
COMMENTS:

COORDINATES (NM State):
North: 2069273.31
East: 2533344.69
TOP OF GROUND ELEVATION (NAVD88): 5363.62 feet A.S.L.

DEPTH (ft)	Lithology Depth	MATERIAL DESCRIPTION
0		
	8.0	Silty Sand (SM), light yellowish brown (2.5 6/4), fine sand, trace fine gravel (0-4'), moist, loose, slight HCL reaction Hand auger to 3 ft, refusal 5-8 ft strong brown
10	19.0	Poorly Graded Sand with Silt (SP-SM), very pale brown (10 YR 7/4), fine sand, moist, loose to medium dense, moderate HCL reaction
20	20.0	Clayey Sand (SC), very pale brown (10 YR 7/4), fine sand, dry, dense, moderately cemented, strong HCL reaction
	29.0	Sandy Silt (ML), strong brown (7.5 YR 5/6), fine sand, moist, loose to medium dense, weakly cemented, slight HCL reaction
30	32.0	Lean Clay with Sand (CL), dark greyish brown (10 YR 4/2), fine sand, moist, soft to medium stiff, platy, no HCL reaction, weathered shale
	33.0	Silty Sand (SM), moderately cemented
40	44.0	Sandy Shale and Sandy Silt (ML), strong brown, interbedded
50	50.0	Lean Clay with Sand (CL), weathered Lewis Shale, dark grey (2.5YR 4/1), slightly moist, very firm



Total Depth of borehole = 50.0 feet bgs

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URS

Borehole: MW-72

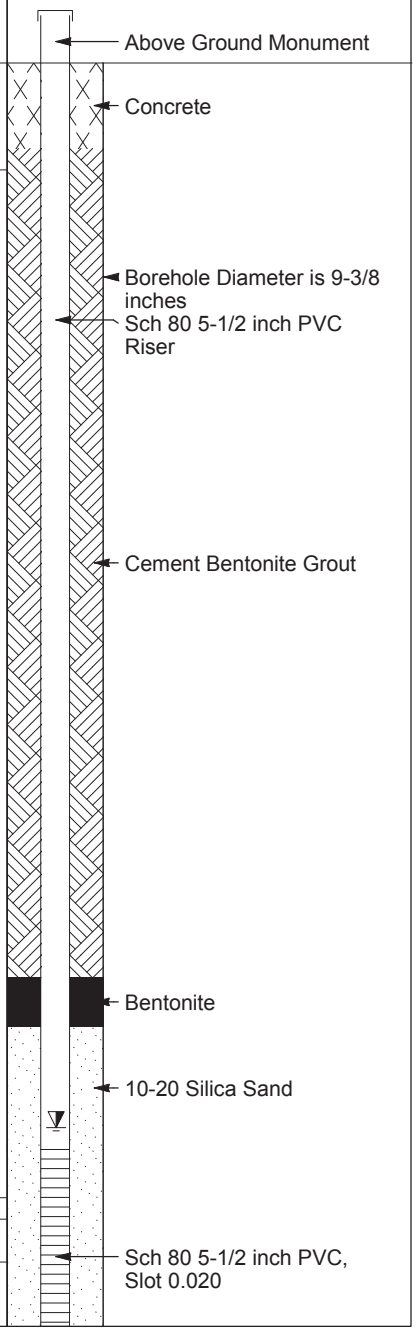
PROJECT: FCCP Monitoring Well Install
CLIENT: APS
LOCATION: FCCP New Mexico
URS PROJECT #: 60437300

DRILLING METHOD: RotoSonic
LOGGED BY: Rick Smith
START DATE/TIME: 3/1/2016 3:00:00 PM
FINISH DATE/TIME: 3/2/2016 3:55:00 PM

Water Level at Drilling Completion (ft bgs):49.72
Screened Interval (ft bgs): 50.74-60.74
COMMENTS:

COORDINATES (NM State):
North: 2069248.07
East: 2534270.98
TOP OF GROUND ELEVATION (NAVD88): 5379.09 feet A.S.L.

DEPTH (ft)	GRAPHIC LOG	Lithology Depth	MATERIAL DESCRIPTION
0			
		5.0	Silty Sand (SM), grey (7.5 YR 5/1), fine sand, trace fine gravel, dry, loose
10			Poorly Graded Sand with Silt (SP-SM), very pale brown ad yellowish brown (10YR 7/4, 5/6), fine sand, slightly moist, loose to medium dense, some cemented layers (1-4' thick), with slight HCL reaction
20			
30			
40			
50			
		53.0	
		54.0	Lean Clay with Sand (CL), dark greyish brown (10YR 4/2), fine sand, dry, hard, cemented, with strong HCL reaction
		56.0	Clayey Sand (SC), grey (10 YR 5/1), fine sand, moist, loose to medium dense, low plasticity



REPORT APS-FCPP-REV1 | PROJECT B:\GINT6\WRES GINT\PROJECTS\APS-FCPP\2015 WELLS.GPJ | LIBRARY APS FCPP-2012.GLB | PRINTED 4/6/16

URS

Borehole: MW-72

PROJECT: FCCP Monitoring Well Install
CLIENT: APS
LOCATION: FCCP New Mexico
URS PROJECT #: 60437300

DRILLING METHOD: RotoSonic
LOGGED BY: Rick Smith
START DATE/TIME: 3/1/2016 3:00:00 PM
FINISH DATE/TIME: 3/2/2016 3:55:00 PM

DEPTH (ft)	GRAPHIC LOG	Lithology Depth	MATERIAL DESCRIPTION	WELL INFORMATION
60		60.0	Silty Sand (SM), greyish brown (7.5 YR 5/2), fine sand, moist, loose to medium dense, some moderate cementation, no HCL reaction *(continued)*	Stainless Steel End Cap

Total Depth of borehole = 61.0 feet bgs

AECOM
7720 N. 16th St.
Phoenix, AZ 85020
Telephone: 602-371-1100

WELL NUMBER MW-73

CLIENT APS
PROJECT NAME APS Four Corners
PROJECT NUMBER 60531071
PROJECT LOCATION Four Corners Power Plant
DATE STARTED 1/17/2017 **COMPLETED** 1/18/2017
GROUND ELEVATION 5351.9 ft **HOLE SIZE** 10 inches
DRILLING CONTRACTOR Cascade Drilling
GROUND WATER LEVELS:
DRILLING METHOD Rotosonic/Continuous Core (LS-600)
AT TIME OF DRILLING 22.00 ft / Elev 5329.90 ft
LOGGED BY R. Smith **CHECKED BY** F. Ackerman
AT END OF DRILLING 21.75 ft / Elev 5330.15 ft
NOTES Screened 28.8 to 43.8 feet bgs
AFTER DRILLING 21.80 ft / Elev 5330.10 ft

DEPTH (ft)	SAMPLE TYPE NUMBER	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION		WELL DIAGRAM
0		HAND AUGER TO 5 FEET WELL BUILT USING 5-INCH SCHEDULE 80 PVC WITH 0.010-INCH SLOT SCREEN	SM		0.0 (SM) **SILTY SAND** Fine sand, gray (Gley, 6/n), moist, loose, coal ash.	5351.9	Capped riser and well vault 2 feet above grade.
5							
7.5						5344.4	
10			SP-SM		(SP-SM) **POORLY GRADED SAND WITH SILT** Fine sand, very pale brown (10YR, 7/4), moist, loose to medium dense, weakly cemented lenses.		Hydrated Portland Cement - Bentonite grout 1 to 20 feet.
15							
20							
22.0 ▼					Possible water lense at 22 feet, 2-3mm gypsum.	5329.9	
25			SP-SM		(SP-SM) **POORLY GRADED SAND WITH SILT** Very pale brown (10YR, 7/4), loose to medium dense, moist. Driller notes mud on shoe at 24 feet.		3/8-inch Bentonite chips 20 to 25 feet.
30							
34.0						5317.9	
35			SC		(SC) **CLAYEY SAND** Fine sand, gray (5YR, 5/1), moist, loose to medium dense, some moderately cemented lenses 1 to 2 inches thick.		20-40 Colorado Silica Sand filter pack. Screened 28.8 to 43.8 feet.
40							
42.0						5309.9	
45			SC		(SC) **CLAYEY SAND** Shale. Fine sand, gray (5YR, 5/1), moist, medium dense, some platy layers, moderately cemented.		Stainless steel end cap.
45.0						5306.9	

Bottom of borehole at 45.0 feet.

GENERAL BH / TP / WELL - GINT STD US LAB.GDT - 18/8/17 09:22 - P:\PROJECTS\ARIZONA_PUBLIC_SERVICE\60531071_FCPP_2017_CCR_WELLS\400-TECHNICAL\432-WELL INSTALLATION 2\GINT\MW-73 MW-74, MW-75, MW-76.GPJ

URS
7720 N 16th Street, Suite 100
Phoenix, AZ 85020
602-371-1100
602-371-1615 (Fax)

BORING LOG: CWTP-1

SHEET 1 of 3
URS PROJECT #: 60445844

PROJECT: FCPP SIA
CLIENT: APS

CONTRACTOR: Cascade Drilling
DRILLER: Mike Lester
FIELD ENGINEER: Lee Wright

COORDINATES **N:** 36.69 **REF. ALIGNMENT:**
E: -108.48 **STATION:**
LOCATION: Four Corners Power Plant **OFFSET:**

RIG TYPE: CME 85
DRILLING METHOD: HSA
HAMMER TYPE: Manual

COMMENTS:

SURFACE ELEV.: 5336
TOTAL DEPTH: 36 FT

START DATE: 02/03/2016 **TIME:** 10:14 AM
FINISH DATE: 02/03/2016 **TIME:** 11:17 AM

Type/Symbol	Augers	Ring Sampler R	Split Spoon S	D&M Lined DM	Shelby Tube U	Cuttings CU
I.D.	4.25"	2.5"	1.375"	2.5"	2.8"	--
O.D.	9"	3"	2"	3"	3"	--
Length	60"	18"	30"	18"	30"	--
Hammer WT.	140 lbs.		Drill Rod Size			
Hammer Fall	30 in.		I.D. (O.D.)			

GROUNDWATER DATA

Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)	Symbol
02/03/16	10:20 AM	11.0	10.0	10.0	▽
02/03/16	10:23 AM	14.3	15.0	15.0	▼

SAMPLE

DEPTH BELOW SURFACE (FT)	USCS	GRAPHIC	TYPE	NUMBER	SYMBOL	DEPTH (FT) FROM	DEPTH (FT) TO	MOISTURE, %	DRY DENSITY (PCF)	SOIL (Blows/6 in.) 0/6	6/12	12/18	N	REC. (in.)	VISUAL MATERIAL CLASSIFICATION AND REMARKS
			BU	B-1		0	5							5 gal.	**EMBANKMENT FILL:** SANDY LEAN CLAY (CL); dark brown; stiff; dry; mostly low plasticity clay; little fine to coarse sand; little silt; little fine to coarse gravel.
5			R	S1B S1A		4	5.5			5	6	6	12	8	
10	CL		U	ST1		9.5	11.5	18	113	P	U	S	H	12	▽

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BORING LOG: CWTP-1

SHEET 2 of 3
URS PROJECT #: 60445844

PROJECT: FCPP SIA
CLIENT: APS

CONTRACTOR: Cascade Drilling
DRILLER: Mike Lester
FIELD ENGINEER: Lee Wright

DEPTH BELOW SURFACE (FT)	USCS	GRAPHIC	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE SYMBOL	DEPTH (FT) FROM	DEPTH (FT) TO	MOISTURE, %	DRY DENSITY (PCF)	SOIL (Blows/6 in.) 0/6	6/12	12/18	N	REC. (in.)	VISUAL MATERIAL CLASSIFICATION AND REMARKS
15			R	S2B S2A		13.5	15			6	8	12	20	10	**EMBANKMENT FILL:** SANDY LEAN CLAY (CL); dark brown; stiff; dry; mostly low plasticity clay; little fine to coarse sand; little silt; little fine to coarse gravel.
20			R	S3B S3A		18.5	20			10	12	15	27	10	
25			R	S4A		23.5	25			7	8	13	21	5	**FILL:** BOTTOM ASH (SM); medium dense; gray, brown, black; wet; mostly fine to coarse sand; little trace silt.
30	SM		R	S5B S5A		28.5	30	65	57	3	4	7	11	9	

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SHEET 3 of 3
URS PROJECT #: 60445844

PROJECT: FCPP SIA
CLIENT: APS

CONTRACTOR: Cascade Drilling
DRILLER: Mike Lester
FIELD ENGINEER: Lee Wright

DEPTH BELOW SURFACE (FT)	USCS	GRAPHIC	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE SYMBOL	DEPTH (FT) FROM	DEPTH (FT) TO	MOISTURE, %	DRY DENSITY (PCF)	SOIL (Blows/6 in.) 0/6	6/12	12/18	N	REC. (in.)	VISUAL MATERIAL CLASSIFICATION AND REMARKS
35			R	S6A		35.58	36			50/5"	-	-	NA	5	**FILL:** BOTTOM ASH (SM); medium dense; gray, brown, black; wet; mostly fine to coarse sand; little silt.
															Auger refusal at 36 feet below ground surface. See groundwater table for groundwater data.

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BORING LOG: CWTP-2

SHEET 1 of 2
URS PROJECT #: 60445844

PROJECT: FCPP SIA
CLIENT: APS

CONTRACTOR: Cascade Drilling
DRILLER: Mike Lester
FIELD ENGINEER: Lee Wright

COORDINATES **N:** 36.69 **REF. ALIGNMENT:**
E: -108.47 **STATION:**
LOCATION: Four Corners Power Plant **OFFSET:**

RIG TYPE: CME 85
DRILLING METHOD: HSA
HAMMER TYPE: Manual

COMMENTS:

SURFACE ELEV.: 5336
TOTAL DEPTH: 23.75 FT

START DATE: 02/03/2016 **TIME:** 02:25 PM
FINISH DATE: 02/03/2016 **TIME:** 03:18 PM

Type/Symbol	Augers	Ring Sampler R	Split Spoon S	D&M Lined DM	Shelby Tube U	Cuttings CU
I.D.	4.25"	2.5"	1.375"	2.5"	2.8"	--
O.D.	9"	3"	2"	3"	3"	--
Length	60"	18"	30"	18"	30"	--
Hammer WT.	140 lbs.		Drill Rod Size			
Hammer Fall	30 in.		I.D. (O.D.)			

GROUNDWATER DATA

Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)	Symbol
02/03/16	02:32 PM	14.8	15.0	15.0	▽
02/03/16	03:18 PM	18.1	23.8	23.8	▼

SAMPLE

DEPTH BELOW SURFACE (FT)	USCS	GRAPHIC	TYPE	NUMBER	SYMBOL	DEPTH (FT) FROM	DEPTH (FT) TO	MOISTURE, %	DRY DENSITY (PCF)	SOIL (Blows/6 in.) 0/6	6/12	12/18	N	REC. (in.)	VISUAL MATERIAL CLASSIFICATION AND REMARKS
			BU	B-1		0	5							5 gal.	**EMBANKMENT FILL:** SANDY LEAN CLAY (CL); stiff; brown; dry; mostly low plasticity clay; some fine to coarse sand; trace fine to coarse gravel.
5	CL		R	S1B S1A		4	5.5			8	12	13	25	12	
10			U	ST1		9.5	11.5	24	101	P	U	S	H	19.8	

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BORING LOG: CWTP-2

SHEET 2 of 2
URS PROJECT #: 60445844

PROJECT: FCPP SIA
CLIENT: APS

CONTRACTOR: Cascade Drilling
DRILLER: Mike Lester
FIELD ENGINEER: Lee Wright

DEPTH BELOW SURFACE (FT)	USCS	GRAPHIC	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE SYMBOL	DEPTH (FT) FROM	DEPTH (FT) TO	MOISTURE, %	DRY DENSITY (PCF)	SOIL (Blows/6 in.) 0/6	6/12	12/18	N	REC. (in.)	VISUAL MATERIAL CLASSIFICATION AND REMARKS
															EMBANKMENT FILL: SANDY LEAN CLAY (CL); stiff; brown; dry; mostly low plasticity clay; some fine to coarse sand; trace fine to coarse gravel.
															EMBANKMENT FILL: SANDY CLAY WITH GRAVEL AND SILT (CL); brown and gray; very stiff; wet; mostly low plasticity clay; some fine to medium sand; little fine to coarse gravel; little silt; trace cobbles.
15			R	S2B S2A		13.5	15			10	10	13	23	10	
	CL														
			U	-		18.5	19			P	U	S	H	0	Possible cobble encoutered at 18.5 feet.
20															
	SM														**FILL:** BOTTOM ASH (SM); medium dense; gray, brown, black; wet; mostly fine to coarse sand; little silt.
	SM		R	S3C S3B		22.25	23.75			26	38	40	78	18	**WEATHERED SANDSTONE:** SILTY SAND (SM); light brown; wet; mostly fine sand; some nonplastic silt.
	CL			S3A											**WEATHERED SHALE:** LEAN CLAY (CL); dark brown; hard; dry; mostly low plasticity clay.
															Auger refusal at 23.75 feet below ground surface. See groundwater table for groundwater data.

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BORING LOG: CWTP-3

SHEET 1 of 2
URS PROJECT #: 60445844

PROJECT: FCPP SIA
CLIENT: APS

CONTRACTOR: Cascade Drilling
DRILLER: Mike Lester
FIELD ENGINEER: Lee Wright

COORDINATES **N:** 36.69 **REF. ALIGNMENT:**
E: -108.47 **STATION:**
LOCATION: Four Corners Power Plant **OFFSET:**

RIG TYPE: CME 85
DRILLING METHOD: HSA
HAMMER TYPE: Manual

COMMENTS:

SURFACE ELEV.: 5336
TOTAL DEPTH: 23.5 FT

START DATE: 02/04/2016 **TIME:** 09:50 AM
FINISH DATE: 02/04/2016 **TIME:** 11:06 AM

Type/Symbol	Augers	Ring Sampler R	Split Spoon S	D&M Lined DM	Shelby Tube U	Cuttings CU
I.D.	4.25"	2.5"	1.375"	2.5"	2.8"	--
O.D.	9"	3"	2"	3"	3"	--
Length	60"	18"	30"	18"	30"	--
Hammer WT.	140 lbs.		Drill Rod Size			
Hammer Fall	30 in.		I.D. (O.D.)			

GROUNDWATER DATA

Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)	Symbol
02/04/16	09:57 AM	4.0	10.0	10.0	▽
02/04/16	11:15 AM	13.2	0.0	NA	▼

SAMPLE

DEPTH BELOW SURFACE (FT)	USCS	GRAPHIC	TYPE	NUMBER	SYMBOL	DEPTH (FT) FROM	DEPTH (FT) TO	MOISTURE, %	DRY DENSITY (PCF)	SOIL (Blows/6 in.) 0/6	6/12	12/18	N	REC. (in.)	VISUAL MATERIAL CLASSIFICATION AND REMARKS
			BU	B-1		0	5							5 gal.	**EMBANKMENT FILL:** SANDY CLAY (CL); very stiff; brown; dry; mostly low plasticity clay; some to little fine to coarse sand.
5	CL		R	S1C S1B S1A		4	5.5			5	11	12	23	18	▽
10			U	ST1		9	11	19 19 21	110 111 109	P	U	S	H	22	Coarser material near the top of the Shelby tube.

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BORING LOG: CWTP-3

SHEET 2 of 2
URS PROJECT #: 60445844

PROJECT: FCPP SIA
CLIENT: APS

CONTRACTOR: Cascade Drilling
DRILLER: Mike Lester
FIELD ENGINEER: Lee Wright

DEPTH BELOW SURFACE (FT)	USCS	GRAPHIC	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE SYMBOL	DEPTH (FT) FROM	DEPTH (FT) TO	MOISTURE, %	DRY DENSITY (PCF)	SOIL (Blows/6 in.) 0/6	6/12	12/18	N	REC. (in.)	VISUAL MATERIAL CLASSIFICATION AND REMARKS
															WEATHERED SANDSTONE: SILTY SAND (SM); brown; very dense; moist to wet; mostly fine to coarse sand; little silt; trace clay (weathered sandstone).
			R	S2C S2B S2A		13.5	15			14	17	50	67	18	
15			U	-		15	15.5			P	U	S	H	0	
			R	S3B S3A		17	17.75	20	108	20	50/3"	-	>50	9	Driller reports hard drilling at 17 feet.
	SM														
			R	S4A		19	19.46			50/5.5"	-	-	NA	5.5	
20															
			R	-		23.5				50/0"	-	-	NA	0	Auger refusal at 23.5 feet below ground surface. See groundwater table for groundwater data.

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BORING LOG: CWTP-4

SHEET 1 of 3
URS PROJECT #: 60445844

PROJECT: FCPP SIA
CLIENT: APS

CONTRACTOR: Cascade
DRILLER: Mike Lester
FIELD ENGINEER: Lee Wright

COORDINATES **N:** 36.69 **REF. ALIGNMENT:**
E: -108.47 **STATION:**
LOCATION: Four Corners Power Plant **OFFSET:**

RIG TYPE: CME 85
DRILLING METHOD: HSA
HAMMER TYPE: Manual

COMMENTS:

SURFACE ELEV.: 5336
TOTAL DEPTH: 37 FT

START DATE: 02/04/2016 **TIME:** 12:50 PM
FINISH DATE: 02/04/2016 **TIME:** 01:30 PM

Type/Symbol	Augers	Ring Sampler R	Split Spoon S	D&M Lined DM	Shelby Tube U	Cuttings CU
I.D.	4.25"	2.5"	1.375"	2.5"	2.8"	--
O.D.	9"	3"	2"	3"	3"	--
Length	60"	18"	30"	18"	30"	--
Hammer WT.	140 lbs.		Drill Rod Size			
Hammer Fall	30 in.		I.D. (O.D.)			

GROUNDWATER DATA

Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)	Symbol
02/04/16	12:59 PM	8.0	10.0	10.0	▽
02/04/16	01:50 PM	7.0	0.0	15.8	▼

SAMPLE

DEPTH BELOW SURFACE (FT)	USCS	GRAPHIC	TYPE	NUMBER	SYMBOL	DEPTH (FT) FROM	DEPTH (FT) TO	MOISTURE, %	DRY DENSITY (PCF)	SOIL (Blows/6 in.) 0/6	6/12	12/18	N	REC. (in.)	VISUAL MATERIAL CLASSIFICATION AND REMARKS
5	CL		R	S1B S1A		4	5.5			10	11	12	23	12	**EMBANKMENT FILL:** SANDY CLAY WITH GRAVEL (CL); dark brown; very stiff; most to wet; mostly low plasticity clay; some to little fine to coarse sand; some fine to coarse rounded to subrounded gravel.
			BU	B-1		5	10							5 gal.	▼ ▽
10			U	BAG1		10	12			P	U	S	H	6	

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BORING LOG: CWTP-4

SHEET 2 of 3
URS PROJECT #: 60445844

PROJECT: FCPP SIA
CLIENT: APS

CONTRACTOR: Cascade
DRILLER: Mike Lester
FIELD ENGINEER: Lee Wright

DEPTH BELOW SURFACE (FT)	USCS	GRAPHIC	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE SYMBOL	DEPTH (FT) FROM	DEPTH (FT) TO	MOISTURE, %	DRY DENSITY (PCF)	SOIL (Blows/6 in.) 0/6	6/12	12/18	N	REC. (in.)	VISUAL MATERIAL CLASSIFICATION AND REMARKS
15			U	ST1		15	17			P	U	S	H	18	**EMBANKMENT FILL:** SANDY CLAY WITH GRAVEL (CL); dark brown; very stiff; most to wet; mostly low plasticity clay; some to little fine to coarse sand; some fine to coarse rounded to subrounded gravel.
20			R	S2C S2B S2A		18.5	20	84	63	3	1	1	2	18	**FILL:** BOTTOM ASH (SM); gray; very loose; wet; mostly fine to coarse angular sand; little nonplastic silt.
25	SM		R	S3C S3B S3A		23.5	25	51	59	4	5	7	12	18	Medium dense to dense; some nonplastic silt.
30			R	S4C S4B S4A		28.5	30	52	60	9	10	11	21	18	

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BORING LOG: CWTP-4

SHEET 3 of 3
URS PROJECT #: 60445844

PROJECT: FCPP SIA
CLIENT: APS

CONTRACTOR: Cascade
DRILLER: Mike Lester
FIELD ENGINEER: Lee Wright

DEPTH BELOW SURFACE (FT)	USCS	GRAPHIC	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE SYMBOL	DEPTH (FT) FROM	DEPTH (FT) TO	MOISTURE, %	DRY DENSITY (PCF)	SOIL (Blows/6 in.) 0/6	6/12	12/18	N	REC. (in.)	VISUAL MATERIAL CLASSIFICATION AND REMARKS
															FILL: BOTTOM ASH (SM); gray; medium dense to dense; wet; mostly fine to coarse angular sand; some nonplastic silt.
35			R	S5C S5B S5A		33.5	35			12	14	18	32	18	
	CL														**WEATHERED SHALE:** LEAN CLAY (CL); dark brown; hard; dry; mostly low plasticity clay. Auger refusal at 37 feet below ground surface. See groundwater table for groundwater data.

APPENDIX C

STONY BROOK WATER REPORT

Analysis Report

FIRST@StonyBrook
Isotope Ratio Mass Spectrometry Laboratory
Department of Geosciences, Stony Brook University
Stony Brook, NY 11794

Quote number: qsb032919
Report Date: 20 May 2019
Material Received: 5 Apr 2019
Report to: Emily Lodolce, John Wood Group PLC

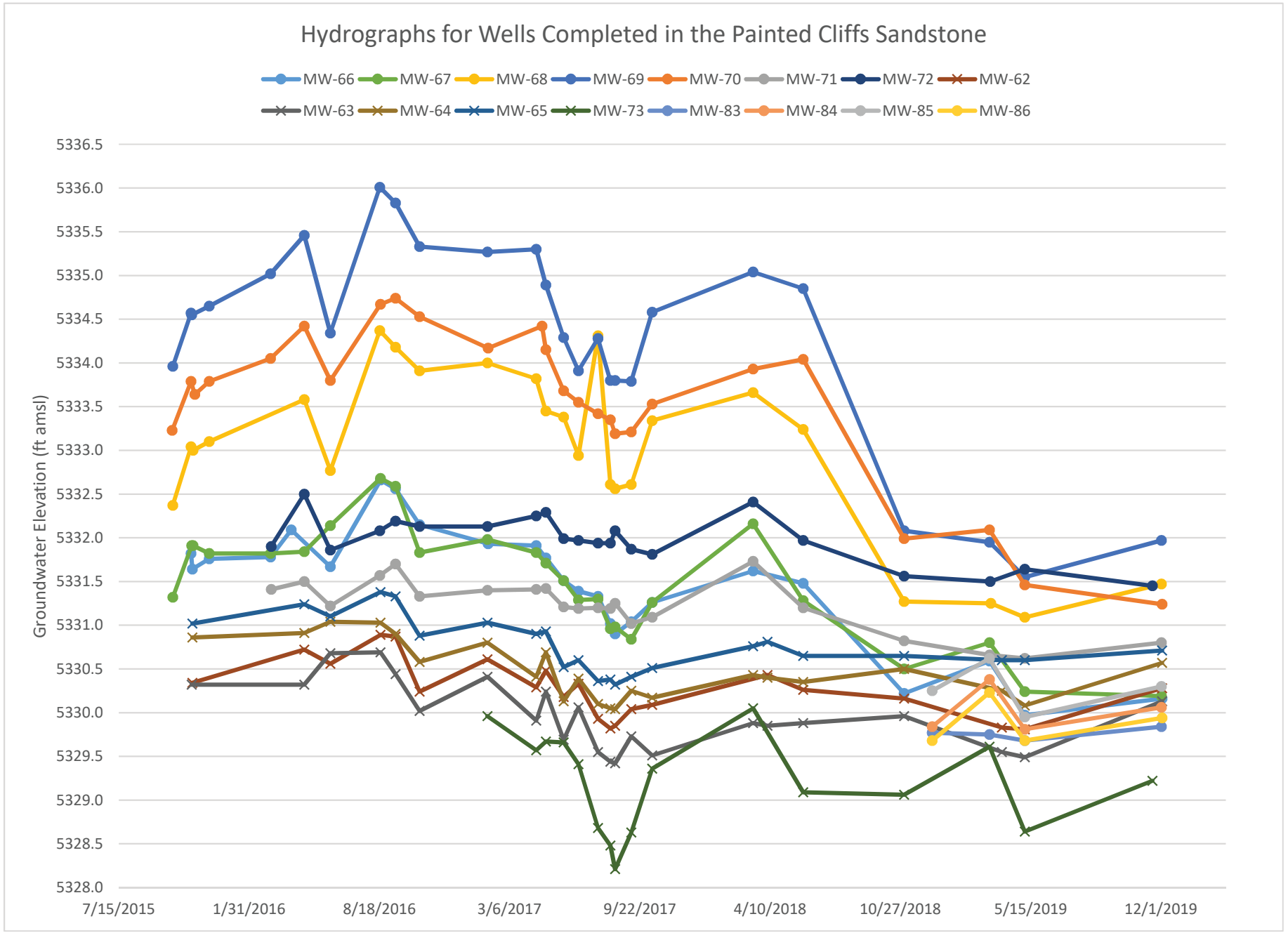
Eleven water sample was analyzed by for its B-isotope composition.

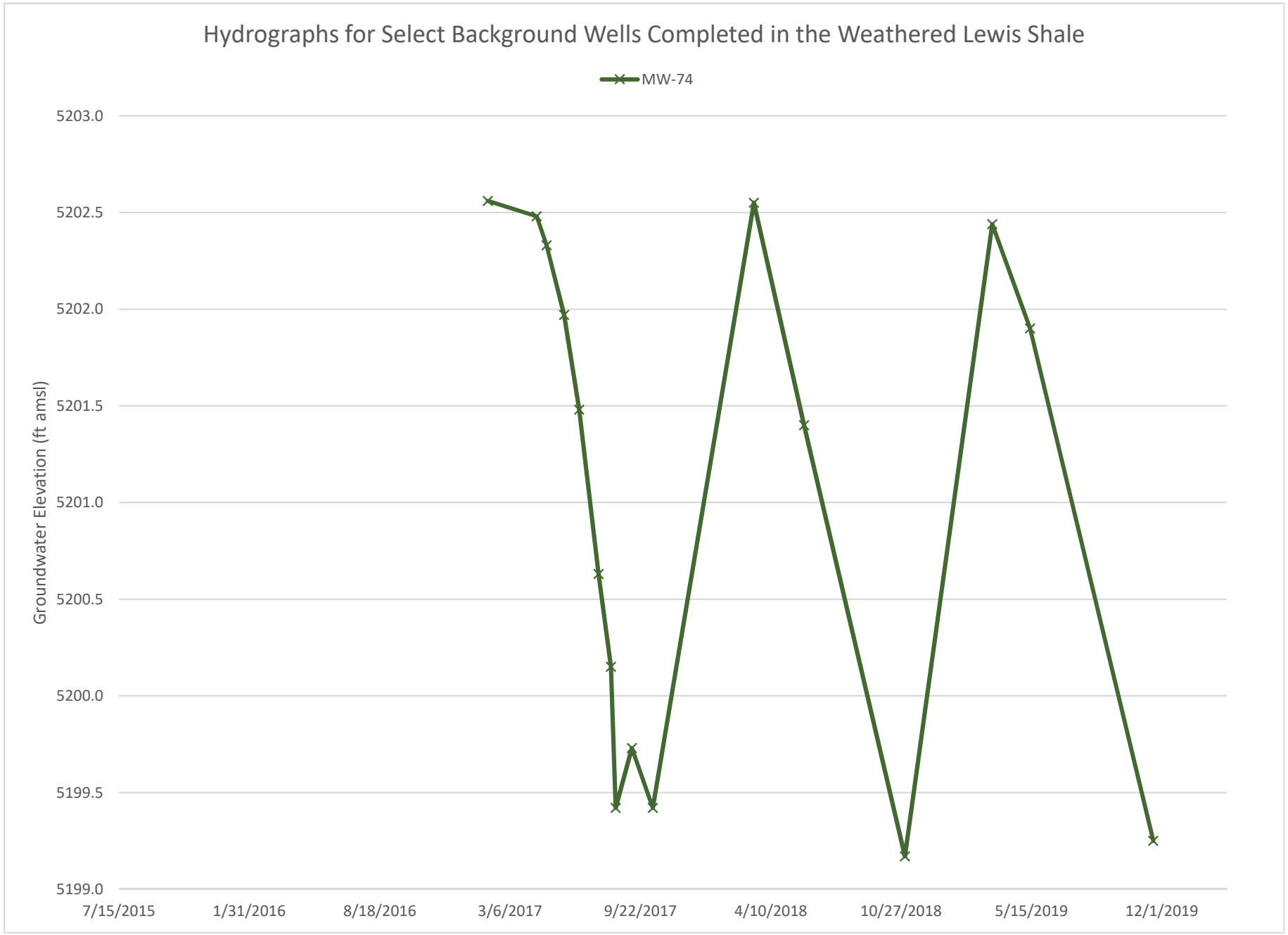
Boron-isotope analyses were carried out on a Nu Plasma II multicollector inductively-coupled plasma mass spectrometer (MC ICP-MS). Accuracy is provided by certified SRM 951 values. The standard used to correct the sample for in-run plasma-induced mass fractionation is a 50 ppb solution of the NIST SRM 951 boric acid. In addition, background was monitored using the same nitric acid and deionized water that was used to dilute the samples and SRM 951 standards, and subtracted from all analysis. The SRM 951 boric acid standard has a certified $^{11}B/^{10}B$ value of 4.0437 ±0.003. Results corrected for background, drift and fractionation, and final $^{11}B/^{10}B$ ratio determination are shown in the table.

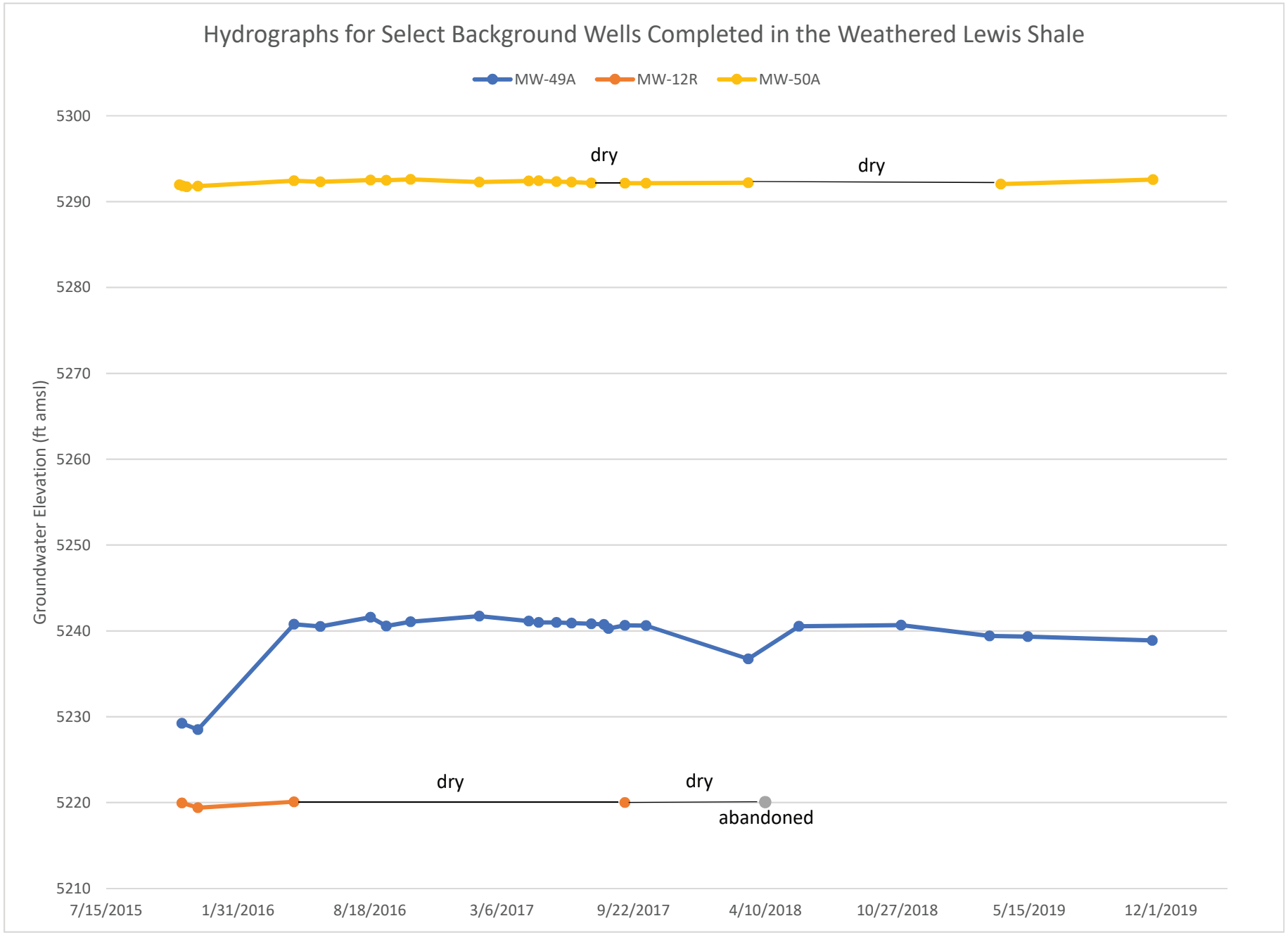
Lab ID	Sample	11/10 B	δ11B (per mil)	2sd Uncert. (per mil)
1904001	FC-CCR-MW62-4119	4.13	21.7	0.2
1904002	FC-CCR-MW63-4119	4.08	9.7	0.7
1904003	FC-CCR-MW64-4119	4.04	-1.2	0.4
1904004	FC-CCR-MW65-4119	4.05	2.4	0.2
1904005	FC-CCR-FD1-4119	4.06	3.0	0.1
1904006	FC-CCR-SW1-4119	4.06	5.1	0.5
1904007	FC-CCR-SW2-4119	4.06	4.4	0.4
1904008	FC-CCR-SW3-4119	4.06	5.2	0.3
1904009	FC-CCR-SW4-4119	4.04	-0.1	0.4
1904010	FC-CCR-SW5-4119	4.06	2.8	0.3
1904011	FC-CCR-SW6-4119	4.06	4.9	0.5

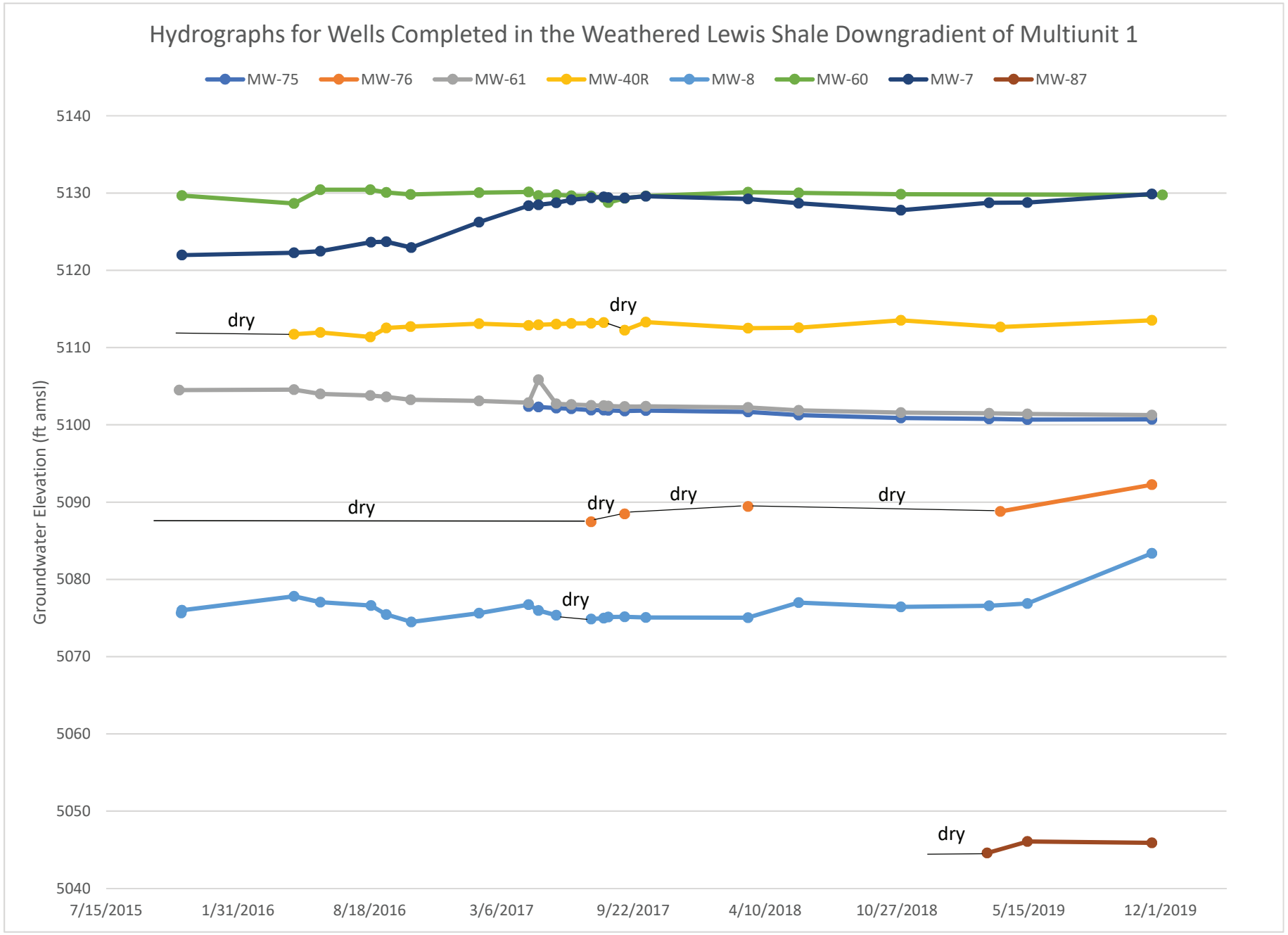
APPENDIX B

GROUNDWATER ELEVATION DATA AND HYDROGRAPHS


Hydrographs for Wells Completed in the Painted Cliffs Sandstone
MW-66
MW-67
MW-68
MW-69
MW-70
MW-71
MW-72
MW-62
MW-63
MW-64
MW-65
MW-73
MW-83
MW-84
MW-85
MW-86
Groundwater Elevation (ft amsl)
5336.5
5336.0
5335.5
5335.0
5334.5
5334.0
5333.5
5333.0
5332.5
5332.0
5331.5
5331.0
5330.5
5330.0
5329.5
5329.0
5328.5
5328.0
7/15/2015
1/31/2016
8/18/2016
3/6/2017
9/22/2017
4/10/2018
10/27/2018
5/15/2019
12/1/2019


Hydrographs for Select Background Wells Completed in the Weathered Lewis Shale
MW-74
Groundwater Elevation (ft amsl)
5203.0
5202.5
5202.0
5201.5
5201.0
5200.5
5200.0
5199.5
5199.0
7/15/2015
1/31/2016
8/18/2016
3/6/2017
9/22/2017
4/10/2018
10/27/2018
5/15/2019
12/1/2019


Hydrographs for Select Background Wells Completed in the Weathered Lewis Shale
MW-49A
MW-12R
MW-50A
Groundwater Elevation (ft amsl)
5300
5290
5280
5270
5260
5250
5240
5230
5220
5210
dry
dry
dry
dry
abandoned
7/15/2015
1/31/2016
8/18/2016
3/6/2017
9/22/2017
4/10/2018
10/27/2018
5/15/2019
12/1/2019


Hydrographs for Wells Completed in the Weathered Lewis Shale Downgradient of Multiunit 1
MW-75
MW-76
MW-61
MW-40R
MW-8
MW-60
MW-7
MW-87
Groundwater Elevation (ft amsl)
5140
5130
5120
5110
5100
5090
5080
5070
5060
5050
5040
7/15/2015
1/31/2016
8/18/2016
3/6/2017
9/22/2017
4/10/2018
10/27/2018
5/15/2019
12/1/2019
dry
dry
dry
dry
dry
dry
dry
dry

MW-7				
Date of Measurement	**Measuring Pt Elevation**	**Water Level**	**GW Elevation**	**Well TD**
11/7/2015	5149.32	27.35	5121.97	
4/25/2016	5149.32	27.04	5122.28	
6/4/2016	5149.32	26.85	5122.47	
8/20/2016	5149.32	25.68	5123.64	
9/12/2016	5149.32	25.61	5123.71	
10/20/2016	5149.32	26.36	5122.96	
1/31/2017	5149.32	23.08	5126.24	36.04
4/16/2017	5149.32	20.95	5128.37	
5/1/2017	5149.32	20.83	5128.49	
5/28/2017	5149.32	20.59	5128.73	
6/20/2017	5149.32	20.21	5129.11	
7/20/2017	5149.32	19.93	5129.39	
8/8/2017	5149.32	19.83	5129.49	
8/15/2017	5149.32	19.91	5129.41	
9/9/2017	5149.32	19.97	5129.35	
10/11/2017	5149.32	19.72	5129.6	
3/15/2018	5149.32	20.07	5129.25	
5/31/2018	5149.32	20.62	5128.7	
11/2/2018	5149.32	21.55	5127.77	
3/16/2019	5149.32	20.59	5128.73	
5/13/2019	5149.32	20.54	5128.78	
11/18/2019	5149.32	19.43	5129.89	

MW-8				
Date of Measurement	**Measuring Pt Elevation**	**Water Level**	**GW Elevation**	**Well TD**
11/6/2015	5122.56	46.9	5075.66	
11/7/2015	5122.56	46.56	5076	
4/25/2016	5122.56	44.76	5077.8	
6/4/2016	5122.56	45.52	5077.04	
8/20/2016	5122.56	45.95	5076.61	
9/12/2016	5122.56	47.11	5075.45	
10/20/2016	5122.56	48.07	5074.49	
1/31/2017	5122.56	46.94	5075.62	
4/16/2017	5122.56	45.82	5076.74	
5/1/2017	5122.56	46.59	5075.97	
5/28/2017	5122.56	47.19	5075.37	
6/20/2017	5122.56	Dry		
7/20/2017	5122.56	47.68	5074.88	
8/8/2017	5122.56	47.57	5074.99	
8/15/2017	5122.56	47.44	5075.12	
9/9/2017	5122.56	47.39	5075.17	
10/11/2017	5122.56	47.49	5075.07	
3/15/2018	5122.56	47.51	5075.05	
5/31/2018	5122.56	45.56	5077	
11/2/2018	5122.56	46.12	5076.44	
3/16/2019	5122.56	45.96	5076.6	
5/13/2019	5122.56	45.68	5076.88	
11/18/2019	5122.56	39.18	5083.38	

MW-12R				
Date of Measurement	**Measuring Pt Elevation**	**Water Level**	**GW Elevation**	**Well TD**
11/7/2015	5264.70	44.75	5219.95	
12/1/2015	5264.70	45.29	5219.41	
4/25/2016	5264.70	44.6	5220.10	
6/4/2016	5264.70	Dry		
8/20/2016	5264.70	Dry		
9/12/2016	5264.70	Dry		
10/19/2016	5264.70	Dry		
1/31/2017	5264.70	Dry		
4/16/2017	5264.70	Dry		
5/1/2017	5264.70	Dry		
5/28/2017	5264.70	Dry		
6/20/2017	5264.70	Dry		
7/20/2017	5264.70	Dry		
8/8/2017	5264.70	Dry		
8/15/2017	5264.70	Dry		
9/9/2017	5264.70	44.68	5220.02	
10/11/2017	5264.70	Dry		
3/15/2018	5264.70	Dry		
ABANDONED ON 4/9/2018				

MW-40R				
Date of Measurement	**Measuring Pt Elevation**	**Water Level**	**GW Elevation**	**Well TD**
11/7/2015	5137.43	Dry		
4/25/2016	5137.43	25.7	5111.73	
6/4/2016	5137.43	25.46	5111.97	
8/19/2016	5137.43	26.05	5111.38	
9/12/2016	5137.43	24.9	5112.53	
10/19/2016	5137.43	24.72	5112.71	
1/31/2017	5137.43	24.34	5113.09	
4/16/2017	5137.43	24.56	5112.87	
5/1/2017	5137.43	24.47	5112.96	
5/28/2017	5137.43	24.38	5113.05	
6/20/2017	5137.43	24.29	5113.14	
7/20/2017	5137.43	24.26	5113.17	
8/8/2017	5137.43	24.19	5113.24	
8/15/2017	5137.43	Dry		
9/9/2017	5137.43	25.18	5112.25	
10/11/2017	5137.43	24.14	5113.29	
3/15/2018	5137.43	24.92	5112.51	
5/31/2018	5137.43	24.86	5112.57	
11/2/2018	5137.43	23.89	5113.54	
4/2/2019	5137.43	24.78	5112.65	
11/18/2019	5137.43	23.91	5113.52	

MW-49A				
Date of Measurement	**Measuring Pt Elevation**	**Water Level**	**GW Elevation**	**Well TD**
11/7/2015	5285.96	56.71	5229.25	
12/1/2015	5285.96	57.45	5228.51	
4/25/2016	5285.96	45.17	5240.79	
6/4/2016	5285.96	45.44	5240.52	
8/19/2016	5285.96	44.38	5241.58	
9/12/2016	5285.96	45.4	5240.56	
10/19/2016	5285.96	44.90	5241.06	
1/31/2017	5285.96	44.23	5241.73	
4/16/2017	5285.96	44.82	5241.14	
5/1/2017	5285.96	44.98	5240.98	
5/28/2017	5285.96	44.98	5240.98	
6/20/2017	5285.96	45.06	5240.9	
7/20/2017	5285.96	45.13	5240.83	
8/8/2017	5285.96	45.22	5240.74	
8/15/2017	5285.96	45.68	5240.28	
9/9/2017	5285.96	45.32	5240.64	
10/11/2017	5285.96	45.34	5240.62	
3/15/2018	5285.96	49.23	5236.73	
5/31/2018	5285.96	45.42	5240.54	
11/2/2018	5285.96	45.29	5240.67	
3/16/2019	5288.62	49.2	5239.42	
5/13/2019	5288.62	49.28	5239.34	
11/18/2019	5288.62	49.74	5238.88	

MW-50A				
Date of Measurement	**Measuring Pt Elevation**	**Water Level**	**GW Elevation**	**Well TD**
11/3/2015	5335.67	43.69	5291.98	
11/8/2015	5335.67	43.84	5291.83	
11/14/2015	5335.67	43.95	5291.72	
12/1/2015	5335.67	43.85	5291.82	
4/25/2016	5335.67	43.23	5292.44	
6/4/2016	5335.67	43.36	5292.31	
8/19/2016	5335.67	43.16	5292.51	
9/12/2016	5335.67	43.18	5292.49	
10/19/2016	5335.67	43.07	5292.6	
1/31/2017	5335.67	43.38	5292.29	
4/16/2017	5335.67	43.25	5292.42	
5/1/2017	5335.67	43.24	5292.43	
5/28/2017	5335.67	43.33	5292.34	
6/20/2017	5335.67	43.39	5292.28	
7/20/2017	5335.67	43.49	5292.18	
8/8/2017	5335.67	Dry		
8/15/2017	5335.67	Dry		
9/9/2017	5335.67	43.51	5292.16	
10/11/2017	5335.67	43.52	5292.15	
3/15/2018	5335.67	43.46	5292.21	
5/31/2018	5335.67	Dry		
11/2/2018	5335.67	Dry		
4/2/2019	5335.67	43.62	5292.05	
11/19/2019	5335.97	43.39	5292.58	

MW-60				
Date of Measurement	**Measuring Pt Elevation**	**Water Level**	**GW Elevation**	**Well TD**
11/7/2015	5144.10	14.41	5129.69	
4/25/2016	5144.10	15.45	5128.65	
6/4/2016	5144.10	13.66	5130.44	
8/19/2016	5144.10	13.66	5130.44	
9/12/2016	5144.10	14.02	5130.08	
10/19/2016	5144.10	14.28	5129.82	
1/31/2017	5144.10	14.03	5130.07	
4/16/2017	5144.10	13.96	5130.14	
5/1/2017	5144.10	14.43	5129.67	
5/28/2017	5144.10	14.30	5129.80	
6/20/2017	5144.10	14.45	5129.65	
7/20/2017	5144.10	14.47	5129.63	
8/8/2017	5144.10	14.69	5129.41	
8/15/2017	5144.10	15.33	5128.77	
9/9/2017	5144.10	14.76	5129.34	
10/11/2017	5144.10	14.47	5129.63	
3/15/2018	5144.10	13.98	5130.12	
5/31/2018	5144.10	14.08	5130.02	
11/2/2018	5144.10	14.26	5129.84	
12/4/2019	5144.10	14.35	5129.75	

MW-61				
Date of Measurement	**Measuring Pt Elevation**	**Water Level**	**GW Elevation**	**Well TD**
11/3/2015	5129.19	24.70	5104.49	
4/25/2016	5129.19	24.64	5104.55	
6/4/2016	5129.19	25.18	5104.01	
8/19/2016	5129.19	25.38	5103.81	
9/12/2016	5129.19	25.55	5103.64	
10/19/2016	5129.19	25.94	5103.25	
1/31/2017	5129.19	26.1	5103.09	
4/16/2017	5129.19	26.32	5102.87	
5/1/2017	5129.19	23.36	5105.83	
5/28/2017	5129.19	26.48	5102.71	
6/20/2017	5129.19	26.56	5102.63	
7/20/2017	5129.19	26.67	5102.52	
8/8/2017	5129.19	26.69	5102.50	
8/15/2017	5129.19	26.75	5102.44	
9/9/2017	5129.19	26.81	5102.38	
10/11/2017	5129.19	26.79	5102.40	
3/15/2018	5129.19	26.93	5102.26	
5/31/2018	5129.19	27.31	5101.88	
11/2/2018	5129.19	27.61	5101.58	
3/16/2019	5129.19	27.7	5101.49	
5/13/2019	5129.19	27.78	5101.41	
11/18/2019	5129.19	27.92	5101.27	

MW-62				
Date of Measurement	**Measuring Pt Elevation**	**Water Level**	**GW Elevation**	**Well TD**
11/5/2015	5341.87	11.53	5330.34	
4/25/2016	5341.87	11.15	5330.72	
6/4/2016	5341.87	11.31	5330.56	
8/20/2016	5341.87	10.98	5330.89	
9/12/2016	5341.87	11.00	5330.87	
10/19/2016	5341.87	11.63	5330.24	
1/31/2017	5341.87	11.26	5330.61	
4/16/2017	5341.87	11.58	5330.29	
5/1/2017	5341.87	11.39	5330.48	
5/28/2017	5341.87	11.69	5330.18	
6/20/2017	5341.87	11.54	5330.33	
7/20/2017	5341.87	11.94	5329.93	
8/8/2017	5341.87	12.05	5329.82	
8/15/2017	5341.87	12.02	5329.85	
9/9/2017	5341.87	11.83	5330.04	
10/11/2017	5341.87	11.78	5330.09	
4/6/2018	5341.87	11.44	5330.43	
5/31/2018	5341.87	11.61	5330.26	
11/2/2018	5341.87	11.71	5330.16	
4/1/2019	5341.87	12.04	5329.83	
5/6/2019	5341.87	12.06	5329.81	
12/3/2019	5341.87	11.59	5330.28	

MW-63				
Date of Measurement	**Measuring Pt Elevation**	**Water Level**	**GW Elevation**	**Well TD**
11/4/2015	5337.02	6.70	5330.32	
4/25/2016	5337.02	6.7	5330.32	
6/4/2016	5337.02	6.34	5330.68	
8/20/2016	5337.02	6.33	5330.69	
9/12/2016	5337.02	6.58	5330.44	
10/19/2016	5337.02	7.0	5330.02	
1/31/2017	5337.02	6.61	5330.41	
4/16/2017	5337.02	7.11	5329.91	
5/1/2017	5337.02	6.78	5330.24	
5/28/2017	5337.02	7.33	5329.69	
6/20/2017	5337.02	6.96	5330.06	
7/20/2017	5337.02	7.47	5329.55	
8/8/2017	5337.02	7.58	5329.44	
8/15/2017	5337.02	7.6	5329.42	
9/9/2017	5337.02	7.29	5329.73	
10/11/2017	5337.02	7.51	5329.51	
3/15/2018	5337.02	7.14	5329.88	
4/6/2018	5337.02	7.17	5329.85	
5/31/2018	5337.02	7.14	5329.88	
11/2/2018	5337.02	7.06	5329.96	
4/1/2019	5337.02	7.47	5329.55	
5/6/2019	5337.02	7.53	5329.49	
12/3/2019	5337.02	6.89	5330.13	

MW-64				
Date of Measurement	**Measuring Pt Elevation**	**Water Level**	**GW Elevation**	**Well TD**
11/5/2015	5337.66	6.80	5330.86	
4/25/2016	5337.66	6.75	5330.91	
6/4/2016	5337.66	6.62	5331.04	
8/20/2016	5337.66	6.63	5331.03	
9/12/2016	5337.66	6.76	5330.90	
10/19/2016	5337.66	7.08	5330.58	
1/31/2017	5337.66	6.86	5330.80	
4/16/2017	5337.66	7.25	5330.41	
5/1/2017	5337.66	6.97	5330.69	
5/28/2017	5337.66	7.53	5330.13	
6/20/2017	5337.66	7.27	5330.39	
7/20/2017	5337.66	7.56	5330.10	
8/8/2017	5337.66	7.61	5330.05	
8/15/2017	5337.66	7.62	5330.04	
9/9/2017	5337.66	7.41	5330.25	
10/11/2017	5337.66	7.49	5330.17	
3/15/2018	5337.66	7.23	5330.43	
4/6/2018	5337.66	7.26	5330.40	
5/31/2018	5337.66	7.31	5330.35	
11/2/2018	5337.66	7.16	5330.50	
4/1/2019	5337.66	7.41	5330.25	
5/6/2019	5337.66	7.58	5330.08	
12/3/2019	5337.66	7.09	5330.57	

MW-65				
Date of Measurement	**Measuring Pt Elevation**	**Water Level**	**GW Elevation**	**Well TD**
11/5/2015	5339.74	8.72	5331.02	
4/25/2016	5339.74	8.5	5331.24	
6/4/2016	5339.74	8.64	5331.10	
8/20/2016	5339.74	8.36	5331.38	
9/12/2016	5339.74	8.41	5331.33	
10/19/2016	5339.74	8.86	5330.88	
1/31/2017	5339.74	8.71	5331.03	
4/16/2017	5339.74	8.84	5330.90	
5/1/2017	5339.74	8.81	5330.93	
5/28/2017	5339.74	9.22	5330.52	
6/20/2017	5339.74	9.14	5330.60	
7/20/2017	5339.74	9.38	5330.36	
8/8/2017	5339.74	9.36	5330.38	
8/15/2017	5339.74	9.42	5330.32	
9/9/2017	5339.74	9.33	5330.41	
10/11/2017	5339.74	9.23	5330.51	
3/15/2018	5339.74	8.98	5330.76	
4/6/2018	5339.74	8.93	5330.81	
5/31/2018	5339.74	9.09	5330.65	
11/2/2018	5339.74	9.09	5330.65	
4/1/2019	5339.74	9.14	5330.60	
5/6/2019	5339.74	9.14	5330.60	
12/3/2019	5339.74	9.03	5330.71	

MW-66				
Date of Measurement	**Measuring Pt Elevation**	**Water Level**	**GW Elevation**	**Well TD**
11/3/2015	5344.69	12.87	5331.82	
11/5/2015	5344.69	13.05	5331.64	
12/1/2015	5344.69	12.93	5331.76	
3/4/2016	5344.69	12.91	5331.78	
4/5/2016	5344.69	12.6	5332.09	
6/4/2016	5344.69	13.02	5331.67	
8/20/2016	5344.69	12.03	5332.66	
9/12/2016	5344.69	12.13	5332.56	
10/19/2016	5344.69	12.54	5332.15	
2/1/2017	5344.69	12.76	5331.93	
4/16/2017	5344.69	12.78	5331.91	
5/1/2017	5344.69	12.92	5331.77	
5/28/2017	5344.69	13.18	5331.51	
6/20/2017	5344.69	13.3	5331.39	
7/20/2017	5344.69	13.36	5331.33	
8/8/2017	5344.69	13.67	5331.02	
8/15/2017	5344.69	13.79	5330.90	
9/9/2017	5344.69	13.65	5331.04	
10/11/2017	5344.69	13.43	5331.26	
3/15/2018	5344.69	13.07	5331.62	
5/31/2018	5344.69	13.21	5331.48	
11/2/2018	5344.69	14.47	5330.22	
3/13/2019	5344.69	14.1	5330.59	
5/6/2019	5344.69	14.72	5329.97	
12/3/2019	5344.69	14.53	5330.16	

MW-67				
Date of Measurement	**Measuring Pt Elevation**	**Water Level**	**GW Elevation**	**Well TD**
10/6/2015	5356.42	25.1	5331.32	
11/4/2015	5356.42	24.51	5331.91	
11/6/2015	5356.42	24.51	5331.91	
12/1/2015	5356.42	24.6	5331.82	
3/4/2016	5356.42	24.6	5331.82	
4/25/2016	5356.42	24.58	5331.84	
6/4/2016	5356.42	24.28	5332.14	
8/20/2016	5356.42	23.74	5332.68	
9/12/2016	5356.42	23.83	5332.59	
10/19/2016	5356.42	24.59	5331.83	
1/31/2017	5356.42	24.44	5331.98	
4/16/2017	5356.42	24.59	5331.83	
5/1/2017	5356.42	24.71	5331.71	
5/28/2017	5356.42	24.91	5331.51	
6/20/2017	5356.42	25.13	5331.29	
7/20/2017	5356.42	25.12	5331.3	
8/8/2017	5356.42	25.46	5330.96	
8/15/2017	5356.42	25.44	5330.98	
9/9/2017	5356.42	25.58	5330.84	
10/11/2017	5356.42	25.16	5331.26	
3/15/2018	5356.42	24.26	5332.16	
5/31/2018	5356.42	25.14	5331.28	
11/2/2018	5352.76	22.26	5330.5	
3/13/2019	5352.76	21.96	5330.8	
5/6/2019	5352.76	22.52	5330.24	
12/2/2019	5352.76	22.57	5330.19	

MW-68				
Date of Measurement	**Measuring Pt Elevation**	**Water Level**	**GW Elevation**	**Well TD**
10/6/2015	5353.58	21.21	5332.37	
11/3/2015	5353.58	20.54	5333.04	
11/6/2015	5353.58	20.58	5333	
12/1/2015	5353.58	20.48	5333.1	
4/25/2016	5353.58	20.0	5333.58	
6/4/2016	5353.58	20.81	5332.77	
8/19/2016	5353.58	19.21	5334.37	
9/12/2016	5353.58	19.4	5334.18	
10/19/2016	5353.58	19.67	5333.91	
1/31/2017	5353.58	19.58	5334	
4/16/2017	5353.58	19.76	5333.82	
5/1/2017	5353.58	20.13	5333.45	
5/28/2017	5353.58	20.20	5333.38	
6/20/2017	5353.58	20.64	5332.94	
7/20/2017	5353.58	19.27	5334.31	
8/8/2017	5353.58	20.97	5332.61	
8/15/2017	5353.58	21.02	5332.56	
9/9/2017	5353.58	20.97	5332.61	
10/11/2017	5353.58	20.24	5333.34	
3/15/2018	5353.58	19.92	5333.66	
5/31/2018	5353.58	20.34	5333.24	
11/2/2018	5353.58	22.31	5331.27	
3/15/2019	5353.58	22.33	5331.25	
5/6/2019	5353.58	22.49	5331.09	
12/2/2019	5353.58	22.11	5331.47	

MW-69				
Date of Measurement	**Measuring Pt Elevation**	**Water Level**	**GW Elevation**	**Well TD**
10/6/2015	5357.66	23.7	5333.96	
11/3/2015	5357.66	23.09	5334.57	
11/4/2015	5357.66	23.11	5334.55	
12/1/2015	5357.66	23.01	5334.65	
3/4/2016	5357.66	22.64	5335.02	
4/25/2016	5357.66	22.2	5335.46	
6/4/2016	5357.66	23.32	5334.34	
8/19/2016	5357.66	21.65	5336.01	
9/12/2016	5357.66	21.83	5335.83	
10/19/2016	5357.66	22.33	5335.33	
1/31/2017	5357.66	22.39	5335.27	
4/16/2017	5357.66	22.36	5335.3	
5/1/2017	5357.66	22.77	5334.89	
5/28/2017	5357.66	23.37	5334.29	
6/20/2017	5357.66	23.75	5333.91	
7/20/2017	5357.66	23.38	5334.28	
8/8/2017	5357.66	23.86	5333.8	
8/15/2017	5357.66	23.86	5333.8	
9/9/2017	5357.66	23.87	5333.79	
10/11/2017	5357.66	23.08	5334.58	
3/15/2018	5357.66	22.62	5335.04	
5/31/2018	5357.66	22.81	5334.85	
11/2/2018	5357.66	25.58	5332.08	
3/13/2019	5357.66	25.71	5331.95	
5/6/2019	5357.66	26.11	5331.55	
12/2/2019	5357.66	25.69	5331.97	

MW-70				
Date of Measurement	**Measuring Pt Elevation**	**Water Level**	**GW Elevation**	**Well TD**
10/5/2015	5371.12	37.89	5333.23	
11/3/2015	5371.12	37.33	5333.79	
11/9/2015	5371.12	37.48	5333.64	
12/1/2015	5371.12	37.33	5333.79	
3/4/2016	5371.12	37.07	5334.05	
4/25/2016	5371.12	36.7	5334.42	
6/4/2016	5371.12	37.32	5333.8	
8/20/2016	5371.12	36.45	5334.67	
9/12/2016	5371.12	36.38	5334.74	
10/19/2016	5371.12	36.59	5334.53	
2/1/2017	5371.12	36.95	5334.17	
4/25/2017	5371.12	36.7	5334.42	
5/1/2017	5371.12	36.97	5334.15	
5/28/2017	5371.12	37.44	5333.68	
6/20/2017	5371.12	37.57	5333.55	
7/20/2017	5371.12	37.7	5333.42	
8/8/2017	5371.12	37.77	5333.35	
8/15/2017	5371.12	37.93	5333.19	
9/9/2017	5371.12	37.91	5333.21	
10/11/2017	5371.12	37.59	5333.53	
3/15/2018	5371.12	37.19	5333.93	
5/31/2018	5371.12	37.08	5334.04	
11/2/2018	5371.12	39.13	5331.99	
3/13/2019	5371.12	39.03	5332.09	
5/6/2019	5371.12	39.66	5331.46	
12/3/2019	5371.12	39.88	5331.24	

MW-71				
Date of Measurement	**Measuring Pt Elevation**	**Water Level**	**GW Elevation**	**Well TD**
3/5/2016	5362.91	31.5	5331.41	
4/25/2016	5362.91	31.41	5331.5	
6/4/2016	5362.91	31.69	5331.22	
8/19/2016	5362.91	31.34	5331.57	
9/12/2016	5362.91	31.21	5331.7	
10/19/2016	5362.91	31.58	5331.33	
1/31/2017	5362.91	31.51	5331.4	
4/16/2017	5362.91	31.50	5331.41	
5/1/2017	5362.91	31.49	5331.42	
5/28/2017	5362.91	31.70	5331.21	
6/20/2017	5362.91	31.72	5331.19	
7/20/2017	5362.91	31.71	5331.2	
8/8/2017	5362.91	31.72	5331.19	
8/15/2017	5362.91	31.66	5331.25	
9/9/2017	5362.91	31.89	5331.02	
10/11/2017	5362.91	31.82	5331.09	
3/15/2018	5362.91	31.18	5331.73	
5/31/2018	5362.91	31.71	5331.2	
11/2/2018	5362.91	32.09	5330.82	
3/13/2019	5362.91	32.25	5330.66	
5/6/2019	5362.91	32.29	5330.62	
12/2/2019	5362.91	32.11	5330.80	

MW-72				
Date of Measurement	**Measuring Pt Elevation**	**Water Level**	**GW Elevation**	**Well TD**
3/5/2016	5381.62	49.72	5331.9	
4/25/2016	5381.62	49.12	5332.5	
6/4/2016	5381.62	49.76	5331.86	
8/19/2016	5381.62	49.54	5332.08	
9/12/2016	5381.62	49.43	5332.19	
10/19/2016	5381.62	49.49	5332.13	
1/31/2017	5381.62	49.49	5332.13	
4/16/2017	5381.62	49.37	5332.25	
5/1/2017	5381.62	49.33	5332.29	
5/28/2017	5381.62	49.63	5331.99	
6/20/2017	5381.62	49.65	5331.97	
7/20/2017	5381.62	49.68	5331.94	
8/8/2017	5381.62	49.68	5331.94	
8/15/2017	5381.62	49.54	5332.08	
9/9/2017	5381.62	49.75	5331.87	
10/11/2017	5381.62	49.81	5331.81	
3/15/2018	5381.62	49.21	5332.41	
5/31/2018	5381.62	49.65	5331.97	
11/2/2018	5381.62	50.06	5331.56	
3/14/2019	5381.62	50.12	5331.5	
5/6/2019	5381.62	49.98	5331.64	
11/18/2019	5381.62	50.17	5331.45	

MW-73				
Date of Measurement	**Measuring Pt Elevation**	**Water Level**	**GW Elevation**	**Well TD**
1/31/2017	5353.95	23.99	5329.96	
4/16/2017	5353.95	24.38	5329.57	
5/1/2017	5353.95	24.28	5329.67	
5/28/2017	5353.95	24.29	5329.66	
6/20/2017	5353.95	24.54	5329.41	
7/20/2017	5353.95	25.27	5328.68	
8/8/2017	5353.95	25.47	5328.48	
8/15/2017	5353.95	25.74	5328.21	
9/9/2017	5353.95	25.32	5328.63	
10/11/2017	5353.95	24.59	5329.36	
3/15/2018	5353.95	23.9	5330.05	
5/31/2018	5353.95	24.86	5329.09	
11/2/2018	5353.95	24.89	5329.06	
3/13/2019	5353.95	24.34	5329.61	
5/6/2019	5353.95	25.31	5328.64	
11/18/2019	5353.95	24.73	5329.22	

MW-74				
Date of Measurement	**Measuring Pt Elevation**	**Water Level**	**GW Elevation**	**Well TD**
1/31/2017	5219.09	16.53	5202.56	
4/16/2017	5219.09	16.61	5202.48	20.86
5/1/2017	5219.09	16.76	5202.33	
5/28/2017	5219.09	17.12	5201.97	
6/20/2017	5219.09	17.61	5201.48	
7/20/2017	5219.09	18.46	5200.63	
8/8/2017	5219.09	18.94	5200.15	
8/15/2017	5219.09	19.67	5199.42	
9/9/2017	5219.09	19.36	5199.73	
10/11/2017	5219.09	19.67	5199.42	
3/15/2018	5219.09	16.54	5202.55	
5/31/2018	5219.09	17.69	5201.4	
11/2/2018	5219.09	19.92	5199.17	
3/16/2019	5219.09	16.65	5202.44	
5/13/2019	5219.09	17.19	5201.9	
11/18/2019	5219.09	19.84	5199.25	

MW-75				
Date of Measurement	**Measuring Pt Elevation**	**Water Level**	**GW Elevation**	**Well TD**
4/16/2017	5126.80	24.42	5102.38	41.85
5/1/2017	5126.80	24.48	5102.32	
5/28/2017	5126.80	24.64	5102.16	
6/20/2017	5126.80	24.71	5102.09	
7/20/2017	5126.80	24.88	5101.92	
8/8/2017	5126.80	24.89	5101.91	
8/15/2017	5126.80	24.93	5101.87	
9/9/2017	5126.80	25.02	5101.78	
10/11/2017	5126.80	24.95	5101.85	
3/15/2018	5126.80	25.13	5101.67	
5/31/2018	5126.80	25.54	5101.26	
11/2/2018	5126.80	25.92	5100.88	
3/16/2019	5126.80	26.04	5100.76	
5/13/2019	5126.80	26.11	5100.69	
11/18/2019	5126.80	26.08	5100.72	

MW-76				
Date of Measurement	**Measuring Pt Elevation**	**Water Level**	**GW Elevation**	**Well TD**
4/16/2017	5116.23	Dry		29.34
5/1/2017	5116.23	Dry		
5/28/2017	5116.23	Dry		
6/20/2017	5116.23	Dry		
7/20/2017	5116.23	28.78	5087.45	
8/8/2017	5116.23	Dry		
8/15/2017	5116.23	Dry		
9/9/2017	5116.23	27.76	5088.47	
10/11/2017	5116.23	Dry		
3/15/2018	5116.23	26.79	5089.44	
5/31/2018	5116.23	Dry		
11/2/2018	5116.23	Dry		
4/2/2019	5116.23	27.44	5088.79	
11/18/2019	5116.23	23.98	5092.25	

MW-83				
Date of Measurement	**Measuring Pt Elevation**	**Water Level**	**GW Elevation**	**Well TD**
12/15/2018	5343.15	13.38	5329.77	
3/13/2019	5343.15	13.4	5329.75	
5/6/2019	5343.15	13.47	5329.68	
12/2/2019	5343.15	13.31	5329.84	

MW-84				
Date of Measurement	**Measuring Pt Elevation**	**Water Level**	**GW Elevation**	**Well TD**
12/15/2018	5338.23	8.39	5329.84	
3/13/2019	5338.23	7.85	5330.38	
5/6/2019	5338.23	8.42	5329.81	
12/2/2019	5338.23	8.17	5330.06	

MW-85				
Date of Measurement	**Measuring Pt Elevation**	**Water Level**	**GW Elevation**	**Well TD**
12/15/2018	5352.78	22.53	5330.25	
3/13/2019	5352.78	22.16	5330.62	
5/6/2019	5352.78	22.83	5329.95	
12/2/2019	5352.78	22.48	5330.30	

MW-86				
Date of Measurement	**Measuring Pt Elevation**	**Water Level**	**GW Elevation**	**Well TD**
12/15/2018	5338.76	9.08	5329.68	
3/13/2019	5338.76	8.53	5330.23	
5/6/2019	5338.76	9.08	5329.68	
12/3/2019	5338.76	8.82	5329.94	

MW-87				
Date of Measurement	**Measuring Pt Elevation**	**Water Level**	**GW Elevation**	**Well TD**
12/15/2018	5076.53	Dry		
3/13/2019	5076.53	31.95	5044.58	
5/13/2019	5076.53	30.46	5046.07	
11/18/2019	5076.53	30.62	5045.91	

APPENDIX C

ANALYTICAL LABORATORY REPORTS

eurofins | Environment Testing TestAmerica



ANALYTICAL REPORT

Eurofins TestAmerica, Phoenix
4625 East Cotton Ctr Blvd
Suite 189
Phoenix, AZ 85040
Tel: (602)437-3340

Laboratory Job ID: 550-119824-1
Laboratory Sample Delivery Group: Four Corners
Client Project/Site: CCR

For:
Arizona Public Service Company
4801 Cholla Lake Rd
Joseph City, Arizona 86032

Attn: Doug Lavarnway

Authorized for release by:
4/17/2019 9:31:31 AM

Ken Baker, Project Manager II
(602)659-7624
ken.baker@testamericainc.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.testamericainc.com

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

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

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Definitions/Glossary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119824-1
SDG: Four Corners

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
D1	Sample required dilution due to matrix.
D5	Minimum Reporting Limit (MRL) adjusted due to sample dilution; analyte was non-detect in the sample.

Metals

Qualifier	Qualifier Description
D2	Sample required dilution due to high concentration of analyte.
L3	The associated blank spike recovery was above method acceptance limits.
M1	Matrix spike recovery was high, the associated blank spike recovery was acceptable.

Glossary

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

Job ID: 550-119824-1

Laboratory: Eurofins TestAmerica, Phoenix

Narrative

Job Narrative
550-119824-1

Comments
No additional comments.

Receipt
The samples were received on 3/21/2019 2:49 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.2º C and 3.1º C.

Receipt Exceptions
COC is requesting Rad 226 + 228.
Client did not provide sample volume for this method.

FC-CCR-MW49A-031919 (550-119824-1), FC-CCR-MW49A-031919 (550-119824-1[MS]), FC-CCR-MW49A-031919 (550-119824-1[MSD]), FC-CCR-MW61-031919 (550-119824-2), FC-CCR-MW74-031919 (550-119824-3), FC-CCR-MW75-031919 (550-119824-4), FC-CCR-MW7-031919 (550-119824-5), FC-CCR-MW8-031919 (550-119824-6), FC-CCR-MW87-031919 (550-119824-7), FC-CCR-MW6-031919 (550-119824-8), FC-CCR-MW38R-031919 (550-119824-9), FC-CCR-MW57-031919 (550-119824-10) and FC-CCR-MW17R-031919 (550-119824-11)

HPLC/IC
Method(s) 300.0: The following samples were diluted for Fluoride by method EPA 300.0 due to the nature of the sample matrix: FC-CCR-MW87-031919 (550-119824-7) and FC-CCR-MW6-031919 (550-119824-8). The samples contained high concentrations of Sulfate which exceeded the instrument's maximum column capacity. Fluoride was not detected in the diluted samples. As such, elevated reporting limits (RLs) have been provided and these data have been qualified with D1 and D5 flags.

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

Metals
Method(s) 200.7: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with preparation batch 550-173022.

Method(s) 200.8 LL: The laboratory control sample (LCS) associated with preparation batch 550-172990 and analytical batch 550-174751 was outside acceptance criteria for Barium. Re-extraction and could not be performed; therefore, the data have been reported. The batch matrix spike/matrix spike duplicate (MS/MSD) was within acceptance limits and may be used to evaluate matrix performance.

Method(s) 200.8 LL: The laboratory control sample (LCS) associated with preparation batch 550-172990 and analytical batch 550-173519 was outside acceptance criteria for Barium. Re-extraction and could not be performed; therefore, the data have been reported. The batch matrix spike/matrix spike duplicate (MS/MSD) was within acceptance limits and may be used to evaluate matrix performance.

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

Sample Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119824-1
SDG: Four Corners

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
550-119824-1	FC-CCR-MW49A-031919	Water	03/19/19 09:25	03/21/19 14:49
550-119824-2	FC-CCR-MW61-031919	Water	03/19/19 16:43	03/21/19 14:49
550-119824-3	FC-CCR-MW74-031919	Water	03/19/19 18:50	03/21/19 14:49
550-119824-4	FC-CCR-MW75-031919	Water	03/19/19 17:43	03/21/19 14:49
550-119824-5	FC-CCR-MW7-031919	Water	03/19/19 12:58	03/21/19 14:49
550-119824-6	FC-CCR-MW8-031919	Water	03/19/19 13:59	03/21/19 14:49
550-119824-7	FC-CCR-MW87-031919	Water	03/19/19 16:22	03/21/19 14:49
550-119824-8	FC-CCR-MW6-031919	Water	03/19/19 12:20	03/21/19 14:49
550-119824-9	FC-CCR-MW38R-031919	Water	03/19/19 15:40	03/21/19 14:49
550-119824-10	FC-CCR-MW57-031919	Water	03/19/19 14:33	03/21/19 14:49
550-119824-11	FC-CCR-MW17R-031919	Water	03/19/19 13:35	03/21/19 14:49

Detection Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119824-1
SDG: Four Corners

Client Sample ID: FC-CCR-MW49A-031919 — Lab Sample ID: 550-119824-1

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	0.92	D1	0.80		mg/L	2		300.0	Total/NA
Lithium	0.56		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0011		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.027		0.00050		mg/L	1		200.8 LL	Total/NA
Chromium	0.0036		0.0010		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.15		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0018	M1	0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00083		0.00010		mg/L	1		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW61-031919 — Lab Sample ID: 550-119824-2

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	1.1		0.40		mg/L	1		300.0	Total/NA
Lithium	0.37		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.00054		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.016		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00093		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.019		0.00050		mg/L	1		200.8 LL	Total/NA
Lead	0.0012		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.092		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.00072		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00016		0.00010		mg/L	1		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW74-031919 — Lab Sample ID: 550-119824-3

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	2.4	D1	0.80		mg/L	2		300.0	Total/NA
Lithium	0.65		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0049		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.014		0.00050		mg/L	1		200.8 LL	Total/NA
Chromium	0.0063		0.0010		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.012		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.14		0.00050		mg/L	1		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW75-031919 — Lab Sample ID: 550-119824-4

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	1.1	D1	0.80		mg/L	2		300.0	Total/NA
Lithium	0.40		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.019	L3	0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.0018		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.045		0.00050		mg/L	1		200.8 LL	Total/NA
Lead	0.0030		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.17		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0026		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00017		0.00010		mg/L	1		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW7-031919 — Lab Sample ID: 550-119824-5

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	0.79		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.00051		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.016		0.00050		mg/L	1		200.8 LL	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Phoenix

Client Sample ID: FC-CCR-MW7-031919 (Continued) — Lab Sample ID: 550-119824-5

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Molybdenum	0.0054		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0054		0.00050		mg/L	1		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW8-031919 — Lab Sample ID: 550-119824-6

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	0.41		0.40		mg/L	1		300.0	Total/NA
Lithium	1.1		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.011		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00029		0.00010		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.011		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0013		0.00050		mg/L	1		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW87-031919 — Lab Sample ID: 550-119824-7

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	1.1		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Antimony	0.0037		0.0010		mg/L	1		200.8 LL	Total/NA
Arsenic	0.0023		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.023	D2	0.0010		mg/L	2		200.8 LL	Total/NA
Cadmium	0.00013		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.032		0.00050		mg/L	1		200.8 LL	Total/NA
Lead	0.00062		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.12		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.090		0.00050		mg/L	1		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW6-031919 — Lab Sample ID: 550-119824-8

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	1.2		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.00069		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.019		0.00050		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0050		0.00050		mg/L	1		200.8 LL	Total/NA
Lead	0.0010		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.017		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.00054		0.00050		mg/L	1		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW38R-031919 — Lab Sample ID: 550-119824-9

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	0.45		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.00051		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.018		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00011		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.17		0.00050		mg/L	1		200.8 LL	Total/NA
Lead	0.00053		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.016		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0037		0.00050		mg/L	1		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW57-031919 — Lab Sample ID: 550-119824-10

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	0.66		0.20		mg/L	1		200.7 Rev 4.4	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-MW57-031919 (Continued) — Lab Sample ID: 550-119824-10

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Barium	0.018		0.00050		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0021		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.011		0.00050		mg/L	1		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW17R-031919 — Lab Sample ID: 550-119824-11

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	0.41		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.017		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.0013		0.00010		mg/L	1		200.8 LL	Total/NA
Chromium	0.0017		0.0010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.065		0.00050		mg/L	1		200.8 LL	Total/NA
Lead	0.0027		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0014		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.00055		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00021		0.00010		mg/L	1		200.8 LL	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-MW49A-031919

Lab Sample ID: 550-119824-1
Date Collected: 03/19/19 09:25
Matrix: Water
Date Received: 03/21/19 14:49

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**0.92**	**D1**	0.80		mg/L			04/02/19 11:27	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 17:45	03/31/19 00:11	1
Lithium	**0.56**		0.20		mg/L		03/26/19 17:45	03/31/19 00:11	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 05:29	1
Arsenic	**0.0011**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:29	1
Barium	**0.027**		0.00050		mg/L		03/26/19 11:38	04/11/19 13:16	1
Cadmium	ND		0.00010		mg/L		03/26/19 11:38	03/30/19 05:29	1
Chromium	**0.0036**		0.0010		mg/L		03/26/19 11:38	03/30/19 05:29	1
Cobalt	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 05:29	1
Lead	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 05:29	1
Molybdenum	**0.15**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:29	1
Selenium	**0.0018**	**M1**	0.00050		mg/L		03/26/19 11:38	03/30/19 05:29	1
Thallium	**0.00083**		0.00010		mg/L		03/26/19 11:38	03/30/19 05:29	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/01/19 12:37	04/01/19 17:01	1

Client Sample ID: FC-CCR-MW61-031919

Lab Sample ID: 550-119824-2
Date Collected: 03/19/19 16:43
Matrix: Water
Date Received: 03/21/19 14:49

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**1.1**		0.40		mg/L			04/01/19 20:17	1

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 17:45	03/31/19 00:34	1
Lithium	**0.37**		0.20		mg/L		03/26/19 17:45	03/31/19 00:34	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 05:38	1
Arsenic	**0.00054**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:38	1
Barium	**0.016**		0.00050		mg/L		04/05/19 07:40	04/05/19 23:38	1
Cadmium	**0.00093**		0.00010		mg/L		03/26/19 11:38	03/30/19 05:38	1
Chromium	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 05:38	1
Cobalt	**0.019**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:38	1
Lead	**0.0012**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:38	1
Molybdenum	**0.092**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:38	1
Selenium	**0.00072**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:38	1
Thallium	**0.00016**		0.00010		mg/L		03/26/19 11:38	03/30/19 05:38	1

Client Sample ID: FC-CCR-MW61-031919

Lab Sample ID: 550-119824-2
Date Collected: 03/19/19 16:43
Matrix: Water
Date Received: 03/21/19 14:49

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/01/19 12:37	04/01/19 17:03	1

Client Sample ID: FC-CCR-MW74-031919

Lab Sample ID: 550-119824-3
Date Collected: 03/19/19 18:50
Matrix: Water
Date Received: 03/21/19 14:49

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**2.4**	**D1**	0.80		mg/L			04/01/19 20:35	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 17:45	03/31/19 00:40	1
Lithium	**0.65**		0.20		mg/L		03/26/19 17:45	03/31/19 00:40	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 05:40	1
Arsenic	**0.0049**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:40	1
Barium	**0.014**		0.00050		mg/L		04/05/19 07:40	04/09/19 22:25	1
Cadmium	ND		0.00010		mg/L		03/26/19 11:38	03/30/19 05:40	1
Chromium	**0.0063**		0.0010		mg/L		03/26/19 11:38	03/30/19 05:40	1
Cobalt	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 05:40	1
Lead	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 05:40	1
Molybdenum	**0.012**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:40	1
Selenium	**0.14**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:40	1
Thallium	ND		0.00010		mg/L		03/26/19 11:38	03/30/19 05:40	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/01/19 12:37	04/01/19 17:05	1

Client Sample ID: FC-CCR-MW75-031919

Lab Sample ID: 550-119824-4
Date Collected: 03/19/19 17:43
Matrix: Water
Date Received: 03/21/19 14:49

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**1.1**	**D1**	0.80		mg/L			04/02/19 12:22	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 17:45	03/31/19 00:52	1
Lithium	**0.40**		0.20		mg/L		03/26/19 17:45	03/31/19 00:52	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 05:42	1
Arsenic	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 05:42	1
Barium	**0.019**	**L3**	0.00050		mg/L		03/26/19 11:38	03/30/19 05:42	1
Cadmium	**0.0018**		0.00010		mg/L		03/26/19 11:38	03/30/19 05:42	1
Chromium	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 05:42	1

Client Sample ID: FC-CCR-MW75-031919
Lab Sample ID: 550-119824-4
Date Collected: 03/19/19 17:43
Matrix: Water
Date Received: 03/21/19 14:49

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	**0.045**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:42	1
Lead	**0.0030**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:42	1
Molybdenum	**0.17**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:42	1
Selenium	**0.0026**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:42	1
Thallium	**0.00017**		0.00010		mg/L		03/26/19 11:38	03/30/19 05:42	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/01/19 12:37	04/01/19 17:06	1

Client Sample ID: FC-CCR-MW7-031919
Lab Sample ID: 550-119824-5
Date Collected: 03/19/19 12:58
Matrix: Water
Date Received: 03/21/19 14:49

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.40		mg/L			04/02/19 12:40	1

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 17:45	03/31/19 00:58	1
Lithium	**0.79**		0.20		mg/L		03/26/19 17:45	03/31/19 00:58	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 05:44	1
Arsenic	**0.00051**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:44	1
Barium	**0.016**		0.00050		mg/L		04/05/19 07:40	04/09/19 03:57	1
Cadmium	ND		0.00010		mg/L		03/26/19 11:38	03/30/19 05:44	1
Chromium	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 05:44	1
Cobalt	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 05:44	1
Lead	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 05:44	1
Molybdenum	**0.0054**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:44	1
Selenium	**0.0054**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:44	1
Thallium	ND		0.00010		mg/L		03/26/19 11:38	03/30/19 05:44	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/01/19 12:37	04/01/19 17:08	1

Client Sample ID: FC-CCR-MW8-031919
Lab Sample ID: 550-119824-6
Date Collected: 03/19/19 13:59
Matrix: Water
Date Received: 03/21/19 14:49

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**0.41**		0.40		mg/L			04/02/19 12:59	1

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 17:45	03/31/19 01:04	1
Lithium	**1.1**		0.20		mg/L		03/26/19 17:45	03/31/19 01:04	1

Client Sample ID: FC-CCR-MW8-031919

Lab Sample ID: 550-119824-6

Date Collected: 03/19/19 13:59
Matrix: Water
Date Received: 03/21/19 14:49

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 05:51	1
Arsenic	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 05:51	1
Barium	**0.011**		0.00050		mg/L		04/05/19 07:40	04/09/19 03:59	1
Cadmium	**0.00029**		0.00010		mg/L		03/26/19 11:38	03/30/19 05:51	1
Chromium	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 05:51	1
Cobalt	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 05:51	1
Lead	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 05:51	1
Molybdenum	**0.011**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:51	1
Selenium	**0.0013**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:51	1
Thallium	ND		0.00010		mg/L		03/26/19 11:38	03/30/19 05:51	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/01/19 12:37	04/01/19 16:57	1

Client Sample ID: FC-CCR-MW87-031919

Lab Sample ID: 550-119824-7

Date Collected: 03/19/19 16:22
Matrix: Water
Date Received: 03/21/19 14:49

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			04/01/19 21:49	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 17:45	03/31/19 01:10	1
Lithium	**1.1**		0.20		mg/L		03/26/19 17:45	03/31/19 01:10	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	**0.0037**		0.0010		mg/L		03/26/19 11:38	03/30/19 07:02	1
Arsenic	**0.0023**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:53	1
Barium	**0.023**	**D2**	0.0010		mg/L		04/05/19 07:40	04/09/19 23:21	2
Cadmium	**0.00013**		0.00010		mg/L		03/26/19 11:38	03/30/19 07:02	1
Chromium	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 05:53	1
Cobalt	**0.032**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:53	1
Lead	**0.00062**		0.00050		mg/L		03/26/19 11:38	03/30/19 07:02	1
Molybdenum	**0.12**		0.00050		mg/L		03/26/19 11:38	03/30/19 07:02	1
Selenium	**0.090**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:53	1
Thallium	ND		0.00010		mg/L		03/26/19 11:38	03/30/19 07:02	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/01/19 12:37	04/01/19 17:11	1

Client Sample ID: FC-CCR-MW6-031919

Lab Sample ID: 550-119824-8

Date Collected: 03/19/19 12:20
Matrix: Water
Date Received: 03/21/19 14:49

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			04/01/19 22:07	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 17:45	03/31/19 01:16	1
Lithium	**1.2**		0.20		mg/L		03/26/19 17:45	03/31/19 01:16	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 05:55	1
Arsenic	**0.00069**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:55	1
Barium	**0.019**		0.00050		mg/L		04/05/19 07:40	04/09/19 22:29	1
Cadmium	ND		0.00010		mg/L		03/26/19 11:38	03/30/19 05:55	1
Chromium	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 05:55	1
Cobalt	**0.0050**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:55	1
Lead	**0.0010**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:55	1
Molybdenum	**0.017**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:55	1
Selenium	**0.00054**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:55	1
Thallium	ND		0.00010		mg/L		03/26/19 11:38	03/30/19 05:55	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/01/19 12:37	04/01/19 17:13	1

Client Sample ID: FC-CCR-MW38R-031919

Lab Sample ID: 550-119824-9

Date Collected: 03/19/19 15:40
Matrix: Water
Date Received: 03/21/19 14:49

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.40		mg/L			04/02/19 13:17	1

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 17:45	03/31/19 01:22	1
Lithium	**0.45**		0.20		mg/L		03/26/19 17:45	03/31/19 01:22	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 05:57	1
Arsenic	**0.00051**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:57	1
Barium	**0.018**		0.00050		mg/L		04/05/19 07:40	04/09/19 04:05	1
Cadmium	**0.00011**		0.00010		mg/L		03/26/19 11:38	03/30/19 05:57	1
Chromium	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 05:57	1
Cobalt	**0.17**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:57	1
Lead	**0.00053**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:57	1
Molybdenum	**0.016**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:57	1
Selenium	**0.0037**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:57	1
Thallium	ND		0.00010		mg/L		03/26/19 11:38	03/30/19 05:57	1

Client Sample ID: FC-CCR-MW38R-031919
Lab Sample ID: 550-119824-9
Date Collected: 03/19/19 15:40
Matrix: Water
Date Received: 03/21/19 14:49

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/01/19 12:37	04/01/19 17:14	1

Client Sample ID: FC-CCR-MW57-031919
Lab Sample ID: 550-119824-10
Date Collected: 03/19/19 14:33
Matrix: Water
Date Received: 03/21/19 14:49

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.40		mg/L			04/02/19 13:36	1

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 17:45	03/31/19 01:28	1
Lithium	**0.66**		0.20		mg/L		03/26/19 17:45	03/31/19 01:28	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 05:59	1
Arsenic	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 05:59	1
Barium	**0.018**		0.00050		mg/L		04/05/19 07:40	04/09/19 22:33	1
Cadmium	ND		0.00010		mg/L		03/26/19 11:38	03/30/19 05:59	1
Chromium	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 05:59	1
Cobalt	**0.0021**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:59	1
Lead	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 05:59	1
Molybdenum	**0.011**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:59	1
Selenium	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 05:59	1
Thallium	ND		0.00010		mg/L		03/26/19 11:38	03/30/19 05:59	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/01/19 12:37	04/01/19 17:16	1

Client Sample ID: FC-CCR-MW17R-031919
Lab Sample ID: 550-119824-11
Date Collected: 03/19/19 13:35
Matrix: Water
Date Received: 03/21/19 14:49

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.40		mg/L			04/02/19 13:54	1

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 17:45	03/31/19 01:34	1
Lithium	**0.41**		0.20		mg/L		03/26/19 17:45	03/31/19 01:34	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 06:01	1
Arsenic	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 06:01	1
Barium	**0.017**		0.00050		mg/L		04/05/19 07:40	04/09/19 23:12	1
Cadmium	**0.0013**		0.00010		mg/L		03/26/19 11:38	03/30/19 06:01	1
Chromium	**0.0017**		0.0010		mg/L		03/26/19 11:38	03/30/19 06:01	1

Client Sample ID: FC-CCR-MW17R-031919

Lab Sample ID: 550-119824-11

Date Collected: 03/19/19 13:35

Matrix: Water

Date Received: 03/21/19 14:49

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	0.065		0.00050		mg/L		03/26/19 11:38	03/30/19 06:01	1
Lead	0.0027		0.00050		mg/L		03/26/19 11:38	03/30/19 06:01	1
Molybdenum	0.0014		0.00050		mg/L		03/26/19 11:38	03/30/19 06:01	1
Selenium	0.00055		0.00050		mg/L		03/26/19 11:38	03/30/19 06:01	1
Thallium	0.00021		0.00010		mg/L		03/26/19 11:38	03/30/19 06:01	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/01/19 12:37	04/01/19 17:09	1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 550-173744/2
Matrix: Water
Analysis Batch: 173744

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.40		mg/L			04/01/19 17:49	1

Lab Sample ID: LCS 550-173744/5
Matrix: Water
Analysis Batch: 173744

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride			4.00	3.99		mg/L		100	90 - 110		

Lab Sample ID: LCSD 550-173744/6
Matrix: Water
Analysis Batch: 173744

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride			4.00	4.01		mg/L		100	90 - 110	0	20

Lab Sample ID: MB 550-173745/1030
Matrix: Water
Analysis Batch: 173745

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.40		mg/L			04/02/19 02:25	1

Lab Sample ID: LCS 550-173745/50
Matrix: Water
Analysis Batch: 173745

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride			4.00	4.04		mg/L		101	90 - 110		

Lab Sample ID: LCSD 550-173745/51
Matrix: Water
Analysis Batch: 173745

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride			4.00	4.04		mg/L		101	90 - 110	0	20

Lab Sample ID: 550-119824-1 MS
Matrix: Water
Analysis Batch: 173745

Client Sample ID: FC-CCR-MW49A-031919
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride	0.92	D1	8.00	8.49	D1	mg/L		95	80 - 120		

Lab Sample ID: 550-119824-1 MSD
Matrix: Water
Analysis Batch: 173745

Client Sample ID: FC-CCR-MW49A-031919
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	0.92	D1	8.00	8.34	D1	mg/L		93	80 - 120	2	20

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 550-173022/1-A
Matrix: Water
Analysis Batch: 173637

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 173022

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 17:45	03/30/19 23:54	1
Lithium	ND		0.20		mg/L		03/26/19 17:45	03/30/19 23:54	1

Lab Sample ID: LCS 550-173022/2-A
Matrix: Water
Analysis Batch: 173637

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 173022

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Beryllium			1.00	0.917		mg/L		92	85 - 115		
Lithium			1.00	0.902		mg/L		90	85 - 115		

Lab Sample ID: LCSD 550-173022/3-A
Matrix: Water
Analysis Batch: 173637

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 173022

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Beryllium			1.00	0.919		mg/L		92	85 - 115	0	20
Lithium			1.00	0.895		mg/L		90	85 - 115	1	20

Lab Sample ID: 550-119767-P-1-B MS
Matrix: Water
Analysis Batch: 173637

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 173022

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Beryllium	ND		1.00	0.906		mg/L		91	70 - 130		
Lithium	ND		1.00	0.952		mg/L		92	70 - 130		

Lab Sample ID: 550-119767-P-1-C MSD
Matrix: Water
Analysis Batch: 173637

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 173022

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Beryllium	ND		1.00	0.903		mg/L		90	70 - 130	0	20
Lithium	ND		1.00	0.971		mg/L		94	70 - 130	2	20

Method: 200.8 LL - Metals (ICP/MS)

Lab Sample ID: MB 550-172990/1-A
Matrix: Water
Analysis Batch: 173519

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 172990

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 05:19	1
Arsenic	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 05:19	1
Cadmium	ND		0.00010		mg/L		03/26/19 11:38	03/30/19 05:19	1
Chromium	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 05:19	1
Cobalt	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 05:19	1
Lead	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 05:19	1
Molybdenum	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 05:19	1
Selenium	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 05:19	1

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 550-172990/1-A
Matrix: Water
Analysis Batch: 173519

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 172990

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Thallium	ND		0.00010		mg/L		03/26/19 11:38	03/30/19 05:19	1

Lab Sample ID: MB 550-172990/1-A
Matrix: Water
Analysis Batch: 174751

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 172990

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Barium	ND		0.00050		mg/L		03/26/19 11:38	04/11/19 13:05	1

Lab Sample ID: LCS 550-172990/2-A
Matrix: Water
Analysis Batch: 173519

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 172990

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Antimony			0.100	0.104		mg/L		104	85 - 115		
Arsenic			0.100	0.104		mg/L		104	85 - 115		
Cadmium			0.100	0.102		mg/L		102	85 - 115		
Chromium			0.100	0.0996		mg/L		100	85 - 115		
Cobalt			0.100	0.0995		mg/L		100	85 - 115		
Lead			0.100	0.103		mg/L		103	85 - 115		
Molybdenum			0.100	0.100		mg/L		100	85 - 115		
Selenium			0.100	0.104		mg/L		104	85 - 115		
Thallium			0.100	0.105		mg/L		105	85 - 115		

Lab Sample ID: LCSD 550-172990/3-A
Matrix: Water
Analysis Batch: 173519

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 172990

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony			0.100	0.108		mg/L		108	85 - 115	4	20
Arsenic			0.100	0.107		mg/L		107	85 - 115	3	20
Cadmium			0.100	0.104		mg/L		104	85 - 115	3	20
Chromium			0.100	0.103		mg/L		103	85 - 115	3	20
Cobalt			0.100	0.103		mg/L		103	85 - 115	3	20
Lead			0.100	0.107		mg/L		107	85 - 115	4	20
Molybdenum			0.100	0.104		mg/L		104	85 - 115	3	20
Selenium			0.100	0.107		mg/L		107	85 - 115	3	20
Thallium			0.100	0.108		mg/L		108	85 - 115	3	20

Lab Sample ID: 550-119824-1 MS
Matrix: Water
Analysis Batch: 173519

Client Sample ID: FC-CCR-MW49A-031919
Prep Type: Total/NA
Prep Batch: 172990

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Antimony	ND		0.100	0.104		mg/L		104	70 - 130		
Arsenic	0.0011		0.100	0.123		mg/L		122	70 - 130		
Cadmium	ND		0.100	0.0919		mg/L		92	70 - 130		
Chromium	0.0036		0.100	0.107		mg/L		103	70 - 130		
Cobalt	ND		0.100	0.0963		mg/L		96	70 - 130		
Lead	ND		0.100	0.0858		mg/L		86	70 - 130		

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Lab Sample ID: 550-119824-1 MS
Matrix: Water
Analysis Batch: 173519

Client Sample ID: FC-CCR-MW49A-031919
Prep Type: Total/NA
Prep Batch: 172990

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Molybdenum	0.15		0.100	0.253		mg/L		101	70 - 130
Selenium	0.0018	M1	0.100	0.166	M1	mg/L		164	70 - 130
Thallium	0.00083		0.100	0.0908		mg/L		90	70 - 130

Lab Sample ID: 550-119824-1 MS
Matrix: Water
Analysis Batch: 174751

Client Sample ID: FC-CCR-MW49A-031919
Prep Type: Total/NA
Prep Batch: 172990

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Barium	0.027		0.100	0.145		mg/L		118	70 - 130

Lab Sample ID: 550-119824-1 MSD
Matrix: Water
Analysis Batch: 173519

Client Sample ID: FC-CCR-MW49A-031919
Prep Type: Total/NA
Prep Batch: 172990

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	ND		0.100	0.105		mg/L		105	70 - 130	0	20
Arsenic	0.0011		0.100	0.122		mg/L		121	70 - 130	1	20
Cadmium	ND		0.100	0.0917		mg/L		92	70 - 130	0	20
Chromium	0.0036		0.100	0.105		mg/L		102	70 - 130	1	20
Cobalt	ND		0.100	0.0941		mg/L		94	70 - 130	2	20
Lead	ND		0.100	0.0854		mg/L		85	70 - 130	0	20
Molybdenum	0.15		0.100	0.252		mg/L		100	70 - 130	0	20
Selenium	0.0018	M1	0.100	0.162	M1	mg/L		161	70 - 130	2	20
Thallium	0.00083		0.100	0.0896		mg/L		89	70 - 130	1	20

Lab Sample ID: 550-119824-1 MSD
Matrix: Water
Analysis Batch: 174751

Client Sample ID: FC-CCR-MW49A-031919
Prep Type: Total/NA
Prep Batch: 172990

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Barium	0.027		0.100	0.146		mg/L		120	70 - 130	1	20

Lab Sample ID: MB 550-174091/1-A
Matrix: Water
Analysis Batch: 174337

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 174091

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Barium	ND		0.00050		mg/L		04/05/19 07:40	04/05/19 23:22	1

Lab Sample ID: LCS 550-174091/2-A
Matrix: Water
Analysis Batch: 174337

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 174091

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Barium			0.100	0.103		mg/L		103	85 - 115

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Lab Sample ID: LCSD 550-174091/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 174337 — **Prep Batch: 174091**

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Barium			0.100	0.105		mg/L		105	85 - 115	1	20

Lab Sample ID: 550-119758-H-1-F MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 174337 — **Prep Batch: 174091**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Barium	0.040		0.100	0.144		mg/L		104	70 - 130

Lab Sample ID: 550-119758-H-1-G MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 174337 — **Prep Batch: 174091**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Barium	0.040		0.100	0.145		mg/L		105	70 - 130	1	20

Method: 245.1 - Mercury (CVAA)

Lab Sample ID: MB 550-173651/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 173684 — **Prep Batch: 173651**

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/01/19 12:37	04/01/19 16:35	1

Lab Sample ID: LCS 550-173651/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 173684 — **Prep Batch: 173651**

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Hg			0.00500	0.00538		mg/L		108	85 - 115

Lab Sample ID: LCSD 550-173651/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 173684 — **Prep Batch: 173651**

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Hg			0.00500	0.00532		mg/L		106	85 - 115	1	20

Lab Sample ID: 550-119595-P-1-E MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 173684 — **Prep Batch: 173651**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Hg	ND		0.00500	0.00459		mg/L		92	70 - 130

Method: 245.1 - Mercury (CVAA) (Continued)

Lab Sample ID: 550-119595-P-1-F MSD
Matrix: Water
Analysis Batch: 173684

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 173651

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Hg	ND		0.00500	0.00516		mg/L		103	70 - 130	12	20

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Analysis Batch: 173744

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119824-2	FC-CCR-MW61-031919	Total/NA	Water	300.0	
550-119824-3	FC-CCR-MW74-031919	Total/NA	Water	300.0	
550-119824-7	FC-CCR-MW87-031919	Total/NA	Water	300.0	
550-119824-8	FC-CCR-MW6-031919	Total/NA	Water	300.0	
MB 550-173744/2	Method Blank	Total/NA	Water	300.0	
LCS 550-173744/5	Lab Control Sample	Total/NA	Water	300.0	
LCSD 550-173744/6	Lab Control Sample Dup	Total/NA	Water	300.0	

Analysis Batch: 173745

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119824-1	FC-CCR-MW49A-031919	Total/NA	Water	300.0	
550-119824-4	FC-CCR-MW75-031919	Total/NA	Water	300.0	
550-119824-5	FC-CCR-MW7-031919	Total/NA	Water	300.0	
550-119824-6	FC-CCR-MW8-031919	Total/NA	Water	300.0	
550-119824-9	FC-CCR-MW38R-031919	Total/NA	Water	300.0	
550-119824-10	FC-CCR-MW57-031919	Total/NA	Water	300.0	
550-119824-11	FC-CCR-MW17R-031919	Total/NA	Water	300.0	
MB 550-173745/1030	Method Blank	Total/NA	Water	300.0	
LCS 550-173745/50	Lab Control Sample	Total/NA	Water	300.0	
LCSD 550-173745/51	Lab Control Sample Dup	Total/NA	Water	300.0	
550-119824-1 MS	FC-CCR-MW49A-031919	Total/NA	Water	300.0	
550-119824-1 MSD	FC-CCR-MW49A-031919	Total/NA	Water	300.0	

Metals

Prep Batch: 172990

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119824-1	FC-CCR-MW49A-031919	Total/NA	Water	200.8	
550-119824-2	FC-CCR-MW61-031919	Total/NA	Water	200.8	
550-119824-3	FC-CCR-MW74-031919	Total/NA	Water	200.8	
550-119824-4	FC-CCR-MW75-031919	Total/NA	Water	200.8	
550-119824-5	FC-CCR-MW7-031919	Total/NA	Water	200.8	
550-119824-6	FC-CCR-MW8-031919	Total/NA	Water	200.8	
550-119824-7	FC-CCR-MW87-031919	Total/NA	Water	200.8	
550-119824-8	FC-CCR-MW6-031919	Total/NA	Water	200.8	
550-119824-9	FC-CCR-MW38R-031919	Total/NA	Water	200.8	
550-119824-10	FC-CCR-MW57-031919	Total/NA	Water	200.8	
550-119824-11	FC-CCR-MW17R-031919	Total/NA	Water	200.8	
MB 550-172990/1-A	Method Blank	Total/NA	Water	200.8	
LCS 550-172990/2-A	Lab Control Sample	Total/NA	Water	200.8	
LCSD 550-172990/3-A	Lab Control Sample Dup	Total/NA	Water	200.8	
550-119824-1 MS	FC-CCR-MW49A-031919	Total/NA	Water	200.8	
550-119824-1 MSD	FC-CCR-MW49A-031919	Total/NA	Water	200.8	

Prep Batch: 173022

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119824-1	FC-CCR-MW49A-031919	Total/NA	Water	200.7	
550-119824-2	FC-CCR-MW61-031919	Total/NA	Water	200.7	
550-119824-3	FC-CCR-MW74-031919	Total/NA	Water	200.7	
550-119824-4	FC-CCR-MW75-031919	Total/NA	Water	200.7	
550-119824-5	FC-CCR-MW7-031919	Total/NA	Water	200.7	

Metals (Continued)

Prep Batch: 173022 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119824-6	FC-CCR-MW8-031919	Total/NA	Water	200.7	
550-119824-7	FC-CCR-MW87-031919	Total/NA	Water	200.7	
550-119824-8	FC-CCR-MW6-031919	Total/NA	Water	200.7	
550-119824-9	FC-CCR-MW38R-031919	Total/NA	Water	200.7	
550-119824-10	FC-CCR-MW57-031919	Total/NA	Water	200.7	
550-119824-11	FC-CCR-MW17R-031919	Total/NA	Water	200.7	
MB 550-173022/1-A	Method Blank	Total/NA	Water	200.7	
LCS 550-173022/2-A	Lab Control Sample	Total/NA	Water	200.7	
LCSD 550-173022/3-A	Lab Control Sample Dup	Total/NA	Water	200.7	
550-119767-P-1-B MS	Matrix Spike	Total/NA	Water	200.7	
550-119767-P-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	200.7	

Analysis Batch: 173519

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119824-1	FC-CCR-MW49A-031919	Total/NA	Water	200.8 LL	172990
550-119824-2	FC-CCR-MW61-031919	Total/NA	Water	200.8 LL	172990
550-119824-3	FC-CCR-MW74-031919	Total/NA	Water	200.8 LL	172990
550-119824-4	FC-CCR-MW75-031919	Total/NA	Water	200.8 LL	172990
550-119824-5	FC-CCR-MW7-031919	Total/NA	Water	200.8 LL	172990
550-119824-6	FC-CCR-MW8-031919	Total/NA	Water	200.8 LL	172990
550-119824-7	FC-CCR-MW87-031919	Total/NA	Water	200.8 LL	172990
550-119824-8	FC-CCR-MW6-031919	Total/NA	Water	200.8 LL	172990
550-119824-9	FC-CCR-MW38R-031919	Total/NA	Water	200.8 LL	172990
550-119824-10	FC-CCR-MW57-031919	Total/NA	Water	200.8 LL	172990
550-119824-11	FC-CCR-MW17R-031919	Total/NA	Water	200.8 LL	172990
MB 550-172990/1-A	Method Blank	Total/NA	Water	200.8 LL	172990
LCS 550-172990/2-A	Lab Control Sample	Total/NA	Water	200.8 LL	172990
LCSD 550-172990/3-A	Lab Control Sample Dup	Total/NA	Water	200.8 LL	172990
550-119824-1 MS	FC-CCR-MW49A-031919	Total/NA	Water	200.8 LL	172990
550-119824-1 MSD	FC-CCR-MW49A-031919	Total/NA	Water	200.8 LL	172990

Analysis Batch: 173570

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119824-7	FC-CCR-MW87-031919	Total/NA	Water	200.8 LL	172990

Analysis Batch: 173637

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119824-1	FC-CCR-MW49A-031919	Total/NA	Water	200.7 Rev 4.4	173022
550-119824-2	FC-CCR-MW61-031919	Total/NA	Water	200.7 Rev 4.4	173022
550-119824-3	FC-CCR-MW74-031919	Total/NA	Water	200.7 Rev 4.4	173022
550-119824-4	FC-CCR-MW75-031919	Total/NA	Water	200.7 Rev 4.4	173022
550-119824-5	FC-CCR-MW7-031919	Total/NA	Water	200.7 Rev 4.4	173022
550-119824-6	FC-CCR-MW8-031919	Total/NA	Water	200.7 Rev 4.4	173022
550-119824-7	FC-CCR-MW87-031919	Total/NA	Water	200.7 Rev 4.4	173022
550-119824-8	FC-CCR-MW6-031919	Total/NA	Water	200.7 Rev 4.4	173022
550-119824-9	FC-CCR-MW38R-031919	Total/NA	Water	200.7 Rev 4.4	173022
550-119824-10	FC-CCR-MW57-031919	Total/NA	Water	200.7 Rev 4.4	173022
550-119824-11	FC-CCR-MW17R-031919	Total/NA	Water	200.7 Rev 4.4	173022
MB 550-173022/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	173022
LCS 550-173022/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	173022
LCSD 550-173022/3-A	Lab Control Sample Dup	Total/NA	Water	200.7 Rev 4.4	173022

Metals (Continued)

Analysis Batch: 173637 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119767-P-1-B MS	Matrix Spike	Total/NA	Water	200.7 Rev 4.4	173022
550-119767-P-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	200.7 Rev 4.4	173022

Prep Batch: 173651

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119824-1	FC-CCR-MW49A-031919	Total/NA	Water	245.1	
550-119824-2	FC-CCR-MW61-031919	Total/NA	Water	245.1	
550-119824-3	FC-CCR-MW74-031919	Total/NA	Water	245.1	
550-119824-4	FC-CCR-MW75-031919	Total/NA	Water	245.1	
550-119824-5	FC-CCR-MW7-031919	Total/NA	Water	245.1	
550-119824-6	FC-CCR-MW8-031919	Total/NA	Water	245.1	
550-119824-7	FC-CCR-MW87-031919	Total/NA	Water	245.1	
550-119824-8	FC-CCR-MW6-031919	Total/NA	Water	245.1	
550-119824-9	FC-CCR-MW38R-031919	Total/NA	Water	245.1	
550-119824-10	FC-CCR-MW57-031919	Total/NA	Water	245.1	
550-119824-11	FC-CCR-MW17R-031919	Total/NA	Water	245.1	
MB 550-173651/1-A	Method Blank	Total/NA	Water	245.1	
LCS 550-173651/2-A	Lab Control Sample	Total/NA	Water	245.1	
LCSD 550-173651/3-A	Lab Control Sample Dup	Total/NA	Water	245.1	
550-119595-P-1-E MS	Matrix Spike	Total/NA	Water	245.1	
550-119595-P-1-F MSD	Matrix Spike Duplicate	Total/NA	Water	245.1	

Analysis Batch: 173684

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119824-1	FC-CCR-MW49A-031919	Total/NA	Water	245.1	173651
550-119824-2	FC-CCR-MW61-031919	Total/NA	Water	245.1	173651
550-119824-3	FC-CCR-MW74-031919	Total/NA	Water	245.1	173651
550-119824-4	FC-CCR-MW75-031919	Total/NA	Water	245.1	173651
550-119824-5	FC-CCR-MW7-031919	Total/NA	Water	245.1	173651
550-119824-6	FC-CCR-MW8-031919	Total/NA	Water	245.1	173651
550-119824-7	FC-CCR-MW87-031919	Total/NA	Water	245.1	173651
550-119824-8	FC-CCR-MW6-031919	Total/NA	Water	245.1	173651
550-119824-9	FC-CCR-MW38R-031919	Total/NA	Water	245.1	173651
550-119824-10	FC-CCR-MW57-031919	Total/NA	Water	245.1	173651
550-119824-11	FC-CCR-MW17R-031919	Total/NA	Water	245.1	173651
MB 550-173651/1-A	Method Blank	Total/NA	Water	245.1	173651
LCS 550-173651/2-A	Lab Control Sample	Total/NA	Water	245.1	173651
LCSD 550-173651/3-A	Lab Control Sample Dup	Total/NA	Water	245.1	173651
550-119595-P-1-E MS	Matrix Spike	Total/NA	Water	245.1	173651
550-119595-P-1-F MSD	Matrix Spike Duplicate	Total/NA	Water	245.1	173651

Prep Batch: 174091

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119824-2	FC-CCR-MW61-031919	Total/NA	Water	200.8	
550-119824-3	FC-CCR-MW74-031919	Total/NA	Water	200.8	
550-119824-5	FC-CCR-MW7-031919	Total/NA	Water	200.8	
550-119824-6	FC-CCR-MW8-031919	Total/NA	Water	200.8	
550-119824-7	FC-CCR-MW87-031919	Total/NA	Water	200.8	
550-119824-8	FC-CCR-MW6-031919	Total/NA	Water	200.8	
550-119824-9	FC-CCR-MW38R-031919	Total/NA	Water	200.8	
550-119824-10	FC-CCR-MW57-031919	Total/NA	Water	200.8	

Metals (Continued)

Prep Batch: 174091 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119824-11	FC-CCR-MW17R-031919	Total/NA	Water	200.8	
MB 550-174091/1-A	Method Blank	Total/NA	Water	200.8	
LCS 550-174091/2-A	Lab Control Sample	Total/NA	Water	200.8	
LCSD 550-174091/3-A	Lab Control Sample Dup	Total/NA	Water	200.8	
550-119758-H-1-F MS	Matrix Spike	Total/NA	Water	200.8	
550-119758-H-1-G MSD	Matrix Spike Duplicate	Total/NA	Water	200.8	

Analysis Batch: 174337

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119824-2	FC-CCR-MW61-031919	Total/NA	Water	200.8 LL	174091
MB 550-174091/1-A	Method Blank	Total/NA	Water	200.8 LL	174091
LCS 550-174091/2-A	Lab Control Sample	Total/NA	Water	200.8 LL	174091
LCSD 550-174091/3-A	Lab Control Sample Dup	Total/NA	Water	200.8 LL	174091
550-119758-H-1-F MS	Matrix Spike	Total/NA	Water	200.8 LL	174091
550-119758-H-1-G MSD	Matrix Spike Duplicate	Total/NA	Water	200.8 LL	174091

Analysis Batch: 174452

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119824-5	FC-CCR-MW7-031919	Total/NA	Water	200.8 LL	174091
550-119824-6	FC-CCR-MW8-031919	Total/NA	Water	200.8 LL	174091
550-119824-9	FC-CCR-MW38R-031919	Total/NA	Water	200.8 LL	174091

Analysis Batch: 174472

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119824-3	FC-CCR-MW74-031919	Total/NA	Water	200.8 LL	174091
550-119824-7	FC-CCR-MW87-031919	Total/NA	Water	200.8 LL	174091
550-119824-8	FC-CCR-MW6-031919	Total/NA	Water	200.8 LL	174091
550-119824-10	FC-CCR-MW57-031919	Total/NA	Water	200.8 LL	174091
550-119824-11	FC-CCR-MW17R-031919	Total/NA	Water	200.8 LL	174091

Analysis Batch: 174751

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119824-1	FC-CCR-MW49A-031919	Total/NA	Water	200.8 LL	172990
MB 550-172990/1-A	Method Blank	Total/NA	Water	200.8 LL	172990
550-119824-1 MS	FC-CCR-MW49A-031919	Total/NA	Water	200.8 LL	172990
550-119824-1 MSD	FC-CCR-MW49A-031919	Total/NA	Water	200.8 LL	172990

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119824-1
SDG: Four Corners

Client Sample ID: FC-CCR-MW49A-031919

Lab Sample ID: 550-119824-1

Date Collected: 03/19/19 09:25
Matrix: Water
Date Received: 03/21/19 14:49

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	173745	04/02/19 11:27	NEL	TAL PHX
Total/NA	Prep	200.7			173022	03/26/19 17:45	BCV	TAL PHX
Total/NA	Prep	200.7			173022	03/26/19 17:45	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173637	03/31/19 00:11	SRA	TAL PHX
Total/NA	Prep	200.8			172990	03/26/19 11:38	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	173519	03/30/19 05:29	ARE	TAL PHX
Total/NA	Prep	200.8			172990	03/26/19 11:38	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174751	04/11/19 13:16	ARE	TAL PHX
Total/NA	Prep	245.1			173651	04/01/19 12:37	JTG	TAL PHX
Total/NA	Analysis	245.1		1	173684	04/01/19 17:01	JTG	TAL PHX

Client Sample ID: FC-CCR-MW61-031919

Lab Sample ID: 550-119824-2

Date Collected: 03/19/19 16:43
Matrix: Water
Date Received: 03/21/19 14:49

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	173744	04/01/19 20:17	NEL	TAL PHX
Total/NA	Prep	200.7			173022	03/26/19 17:45	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173637	03/31/19 00:34	SRA	TAL PHX
Total/NA	Prep	200.8			172990	03/26/19 11:38	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	173519	03/30/19 05:38	ARE	TAL PHX
Total/NA	Prep	200.8			174091	04/05/19 07:40	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174337	04/05/19 23:38	ARE	TAL PHX
Total/NA	Prep	245.1			173651	04/01/19 12:37	JTG	TAL PHX
Total/NA	Analysis	245.1		1	173684	04/01/19 17:03	JTG	TAL PHX

Client Sample ID: FC-CCR-MW74-031919

Lab Sample ID: 550-119824-3

Date Collected: 03/19/19 18:50
Matrix: Water
Date Received: 03/21/19 14:49

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	173744	04/01/19 20:35	NEL	TAL PHX
Total/NA	Prep	200.7			173022	03/26/19 17:45	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173637	03/31/19 00:40	SRA	TAL PHX
Total/NA	Prep	200.8			172990	03/26/19 11:38	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	173519	03/30/19 05:40	ARE	TAL PHX
Total/NA	Prep	200.8			174091	04/05/19 07:40	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174472	04/09/19 22:25	ARE	TAL PHX
Total/NA	Prep	245.1			173651	04/01/19 12:37	JTG	TAL PHX
Total/NA	Analysis	245.1		1	173684	04/01/19 17:05	JTG	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119824-1
SDG: Four Corners

Client Sample ID: FC-CCR-MW75-031919
Date Collected: 03/19/19 17:43
Date Received: 03/21/19 14:49

Lab Sample ID: 550-119824-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	173745	04/02/19 12:22	NEL	TAL PHX
Total/NA	Prep	200.7			173022	03/26/19 17:45	BCV	TAL PHX
Total/NA	Prep	200.7			173022	03/26/19 17:45	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173637	03/31/19 00:52	SRA	TAL PHX
Total/NA	Prep	200.8			172990	03/26/19 11:38	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	173519	03/30/19 05:42	ARE	TAL PHX
Total/NA	Prep	245.1			173651	04/01/19 12:37	JTG	TAL PHX
Total/NA	Analysis	245.1		1	173684	04/01/19 17:06	JTG	TAL PHX

Client Sample ID: FC-CCR-MW7-031919
Date Collected: 03/19/19 12:58
Date Received: 03/21/19 14:49

Lab Sample ID: 550-119824-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	173745	04/02/19 12:40	NEL	TAL PHX
Total/NA	Prep	200.7			173022	03/26/19 17:45	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173637	03/31/19 00:58	SRA	TAL PHX
Total/NA	Prep	200.8			172990	03/26/19 11:38	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	173519	03/30/19 05:44	ARE	TAL PHX
Total/NA	Prep	200.8			174091	04/05/19 07:40	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174452	04/09/19 03:57	ARE	TAL PHX
Total/NA	Prep	245.1			173651	04/01/19 12:37	JTG	TAL PHX
Total/NA	Analysis	245.1		1	173684	04/01/19 17:08	JTG	TAL PHX

Client Sample ID: FC-CCR-MW8-031919
Date Collected: 03/19/19 13:59
Date Received: 03/21/19 14:49

Lab Sample ID: 550-119824-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	173745	04/02/19 12:59	NEL	TAL PHX
Total/NA	Prep	200.7			173022	03/26/19 17:45	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173637	03/31/19 01:04	SRA	TAL PHX
Total/NA	Prep	200.8			172990	03/26/19 11:38	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	173519	03/30/19 05:51	ARE	TAL PHX
Total/NA	Prep	200.8			174091	04/05/19 07:40	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174452	04/09/19 03:59	ARE	TAL PHX
Total/NA	Prep	245.1			173651	04/01/19 12:37	JTG	TAL PHX
Total/NA	Analysis	245.1		1	173684	04/01/19 16:57	JTG	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119824-1
SDG: Four Corners

Client Sample ID: FC-CCR-MW87-031919
Date Collected: 03/19/19 16:22
Date Received: 03/21/19 14:49

Lab Sample ID: 550-119824-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	173744	04/01/19 21:49	NEL	TAL PHX
Total/NA	Prep	200.7			173022	03/26/19 17:45	BCV	TAL PHX
Total/NA	Prep	200.7			173022	03/26/19 17:45	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173637	03/31/19 01:10	SRA	TAL PHX
Total/NA	Prep	200.8			172990	03/26/19 11:38	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	173519	03/30/19 05:53	ARE	TAL PHX
Total/NA	Prep	200.8			172990	03/26/19 11:38	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	173570	03/30/19 07:02	ARE	TAL PHX
Total/NA	Prep	200.8			174091	04/05/19 07:40	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		2	174472	04/09/19 23:21	ARE	TAL PHX
Total/NA	Prep	245.1			173651	04/01/19 12:37	JTG	TAL PHX
Total/NA	Analysis	245.1		1	173684	04/01/19 17:11	JTG	TAL PHX

Client Sample ID: FC-CCR-MW6-031919
Date Collected: 03/19/19 12:20
Date Received: 03/21/19 14:49

Lab Sample ID: 550-119824-8
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	173744	04/01/19 22:07	NEL	TAL PHX
Total/NA	Prep	200.7			173022	03/26/19 17:45	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173637	03/31/19 01:16	SRA	TAL PHX
Total/NA	Prep	200.8			172990	03/26/19 11:38	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	173519	03/30/19 05:55	ARE	TAL PHX
Total/NA	Prep	200.8			174091	04/05/19 07:40	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174472	04/09/19 22:29	ARE	TAL PHX
Total/NA	Prep	245.1			173651	04/01/19 12:37	JTG	TAL PHX
Total/NA	Analysis	245.1		1	173684	04/01/19 17:13	JTG	TAL PHX

Client Sample ID: FC-CCR-MW38R-031919
Date Collected: 03/19/19 15:40
Date Received: 03/21/19 14:49

Lab Sample ID: 550-119824-9
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	173745	04/02/19 13:17	NEL	TAL PHX
Total/NA	Prep	200.7			173022	03/26/19 17:45	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173637	03/31/19 01:22	SRA	TAL PHX
Total/NA	Prep	200.8			172990	03/26/19 11:38	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	173519	03/30/19 05:57	ARE	TAL PHX
Total/NA	Prep	200.8			174091	04/05/19 07:40	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174452	04/09/19 04:05	ARE	TAL PHX
Total/NA	Prep	245.1			173651	04/01/19 12:37	JTG	TAL PHX
Total/NA	Analysis	245.1		1	173684	04/01/19 17:14	JTG	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119824-1
SDG: Four Corners

Client Sample ID: FC-CCR-MW57-031919

Lab Sample ID: 550-119824-10

Date Collected: 03/19/19 14:33

Matrix: Water

Date Received: 03/21/19 14:49

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	173745	04/02/19 13:36	NEL	TAL PHX

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			173022	03/26/19 17:45	BCV	TAL PHX
Total/NA	Prep	200.7			173022	03/26/19 17:45	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173637	03/31/19 01:28	SRA	TAL PHX
Total/NA	Prep	200.8			172990	03/26/19 11:38	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	173519	03/30/19 05:59	ARE	TAL PHX
Total/NA	Prep	200.8			174091	04/05/19 07:40	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174472	04/09/19 22:33	ARE	TAL PHX
Total/NA	Prep	245.1			173651	04/01/19 12:37	JTG	TAL PHX
Total/NA	Analysis	245.1		1	173684	04/01/19 17:16	JTG	TAL PHX

Client Sample ID: FC-CCR-MW17R-031919

Lab Sample ID: 550-119824-11

Date Collected: 03/19/19 13:35

Matrix: Water

Date Received: 03/21/19 14:49

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	173745	04/02/19 13:54	NEL	TAL PHX
Total/NA	Prep	200.7			173022	03/26/19 17:45	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173637	03/31/19 01:34	SRA	TAL PHX
Total/NA	Prep	200.8			172990	03/26/19 11:38	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	173519	03/30/19 06:01	ARE	TAL PHX
Total/NA	Prep	200.8			174091	04/05/19 07:40	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174472	04/09/19 23:12	ARE	TAL PHX
Total/NA	Prep	245.1			173651	04/01/19 12:37	JTG	TAL PHX
Total/NA	Analysis	245.1		1	173684	04/01/19 17:09	JTG	TAL PHX

Laboratory References:

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

Accreditation/Certification Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119824-1
SDG: Four Corners

Laboratory: Eurofins TestAmerica, Phoenix

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Arizona	State Program	9	AZ0728	06-09-19

Method Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119824-1
SDG: Four Corners

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL PHX
200.7 Rev 4.4	Metals (ICP)	40CFR136A	TAL PHX
200.8 LL	Metals (ICP/MS)	EPA	TAL PHX
245.1	Mercury (CVAA)	EPA	TAL PHX
200.7	Preparation, Total Metals	EPA	TAL PHX
200.8	Preparation, Total Metals	EPA	TAL PHX
245.1	Preparation, Mercury	EPA	TAL PHX

Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.
EPA = US Environmental Protection Agency
MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

Laboratory References:

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

TestAmerica Phoenix
4645 E Cotton Ctr Blvd Bdg 3
Phoenix, AZ 85040
phone 602.437.3340 fax 623.445.6192

119824

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Doug Lavarnway	Site Contact: Doug Lavarnway	Date: 03/21/19	COC No:
APS Four Corners	Tel/Fax: 928-587-0319	Lab Contact: Ken Baker	Carrier:	1 of 1 COCs
PO Box 355, MS 4915	Analysis Turnaround Time			Job No.
Fruitland, NM 87416	Calendar (C) or Work Days (W)			1420192014.****.2
Phone:	TAT if different from Below 7 Days			
Fax:	☐ 2 weeks			
Project Name: CCR	☐ 1 week			
E-Mail Address:	☐ 2 days			
	☐ 1 day			

550-119824 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	Perform MS / MSD (Y / N)	EPA 200.7 (Be, Li)	200.8 (Sb, As, Ba, Cd, Cr, Co, Pb, Mo, Se, Tl)	Radium 226 + 228 combined	EPA 245.1 (Hg)	EPA 300.0 (F)	Sample Specific Notes:
FC-CCR-MW49A- 031919	03/19/19	09:25	G	W	2	N	N	X	X	X	X	X	-01
FC-CCR-MW61- 031919	03/19/19	16:43	G	W	2	N	N	X	X	X	X	X	-02
FC-CCR-MW74-031819	03/18/19	18:50	G	W	2	N	N	X	X	X	X	X	-03
FC-CCR-MW75-031919	03/19/19	17:43	G	W	2	N	N	X	X	X	X	X	-04
FC-CCR-MW7- 032019	03/20/19	12:58	G	W	2	N	N	X	X	X	X	X	-05
FC-CCR-MW8- 032019	03/20/19	13:59	G	W	2	N	N	X	X	X	X	X	-06
FC-CCR-MW87- 032019	03/20/19	16:22	G	W	2	N	N	X	X	X	X	X	-07
FC-CCR-MW6- 031919	03/19/19	12:20	G	W	2	N	N	X	X	X	X	X	-08
FC-CCR-MW38R-031919	03/19/19	15:40	G	W	2	N	N*	X	X	X	X	X	-09
FC-CCR-MW57- 031919	03/19/19	14:33	G	W	2	N	N	X	X	X	X	X	-10
FC-CCR-MW17R- 031919	03/19/19	15:35	G	W	2	N	N	X	X	X	X	X	-11
~~FC-CCR-FD01~~			G	W		N		X	X	X	X	X	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Special Instructions/QC Requirements & Comments:
Method 200.8 with collision cell
Radium to be analyzed by Radiation Safety

2.2 | 3.1²

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Wood	3/21/19			
Relinquished by:	Company:	Date/Time: 4:49	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by: Lisa Maycock	Company: TAP NC	Date/Time: 3/21/19 1449

Login Sample Receipt Checklist

Client: Arizona Public Service Company

Job Number: 550-119824-1
SDG Number: Four Corners

Login Number: 119824
List Number: 1
Creator: Gravlin, Andrea

List Source: Eurofins TestAmerica, Phoenix

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

eurofins | Environment Testing TestAmerica



ANALYTICAL REPORT

Eurofins TestAmerica, Phoenix
4625 East Cotton Ctr Blvd
Suite 189
Phoenix, AZ 85040
Tel: (602)437-3340

Laboratory Job ID: 550-119829-1
Client Project/Site: CCR

For:
Arizona Public Service Company
4801 Cholla Lake Rd
Joseph City, Arizona 86032

Attn: Doug Lavarnway

Authorized for release by:
4/18/2019 8:04:07 AM

Ken Baker, Project Manager II
(602)659-7624
ken.baker@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

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

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

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Definitions/Glossary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119829-1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
D1	Sample required dilution due to matrix.
D5	Minimum Reporting Limit (MRL) adjusted due to sample dilution; analyte was non-detect in the sample.

Metals

Qualifier	Qualifier Description
M1	Matrix spike recovery was high, the associated blank spike recovery was acceptable.

Glossary

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

Case Narrative

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119829-1

Job ID: 550-119829-1

Laboratory: Eurofins TestAmerica, Phoenix

Narrative

Job Narrative
550-119829-1

Comments
No additional comments.

Receipt
The samples were received on 3/21/2019 2:49 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.2º C and 3.1º C.

Receipt Exceptions
Radium 226 + 228 are requested on the COC.
Client did not provide sample volume for this method.

FC-CCR-MW15-032019 (550-119829-1), FC-CCR-MW15-032019 (550-119829-1[MS]), FC-CCR-MW15-032019 (550-119829-1[MSD]), FC-CCR-DMX6-031919 (550-119829-2), FC-CCR-MW16-032019 (550-119829-3), FC-CCR-MW56-032019 (550-119829-4) and FC-CCR-DMX4-031919 (550-119829-5)

HPLC/IC
Method(s) 300.0: The following samples were diluted for Fluoride by method EPA 300.0 due to the nature of the sample matrix: FC-CCR-MW15-032019 (550-119829-1), FC-CCR-DMX6-031919 (550-119829-2), FC-CCR-MW16-032019 (550-119829-3) and FC-CCR-DMX4-031919 (550-119829-5). The samples contained high concentrations of Sulfate which exceeded the instrument's maximum column capacity. Fluoride was not detected in the diluted samples. As such, elevated reporting limits (RLs) have been provided and these data have been qualified with D1 and D5 flags.

Method(s) 300.0: The following sample was diluted for Fluoride by method EPA 300.0 due to the nature of the sample matrix: FC-CCR-MW56-032019 (550-119829-4). The samples contained high concentrations of Sulfate which exceeded the instrument's maximum column capacity. Fluoride was not detected in the diluted samples. As such, elevated reporting limits (RLs) have been provided and these data have been qualified with D1 and D5 flags.

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

Metals
Method(s) 200.8 LL: The laboratory control sample (LCS) associated with preparation batch 550-172990 and analytical batch 550-174751 was outside acceptance criteria for Barium. Re-extraction and could not be performed; therefore, the data have been reported. The batch matrix spike/matrix spike duplicate (MS/MSD) was within acceptance limits and may be used to evaluate matrix performance.

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

Sample Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119829-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
550-119829-1	FC-CCR-MW15-032019	Water	03/20/19 11:07	03/21/19 14:49
550-119829-2	FC-CCR-DMX6-031919	Water	03/19/19 18:40	03/21/19 14:49
550-119829-3	FC-CCR-MW16-032019	Water	03/20/19 12:04	03/21/19 14:49
550-119829-4	FC-CCR-MW56-032019	Water	03/20/19 15:17	03/21/19 14:49
550-119829-5	FC-CCR-DMX4-031919	Water	03/19/19 10:56	03/21/19 14:49

Detection Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119829-1

Client Sample ID: FC-CCR-MW15-032019 — Lab Sample ID: 550-119829-1

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	0.92		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.020		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00015		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0020		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.036		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.00071		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00018		0.00010		mg/L	1		200.8 LL	Total/NA

Client Sample ID: FC-CCR-DMX6-031919 — Lab Sample ID: 550-119829-2

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	1.0		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.011		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00015		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0011		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.051		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.00050		0.00050		mg/L	1		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW16-032019 — Lab Sample ID: 550-119829-3

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	1.2		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0018		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.021		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00015		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0062		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0033		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.045		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00041		0.00010		mg/L	1		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW56-032019 — Lab Sample ID: 550-119829-4

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	1.2		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0084		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.021		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00011		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.00075		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.089		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.21		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00075		0.00010		mg/L	1		200.8 LL	Total/NA

Client Sample ID: FC-CCR-DMX4-031919 — Lab Sample ID: 550-119829-5

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	0.66		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.00084		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.0097		0.00050		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0028		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.016		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0033		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00028		0.00010		mg/L	1		200.8 LL	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Phoenix

Client Sample ID: FC-CCR-MW15-032019

Lab Sample ID: 550-119829-1

Date Collected: 03/20/19 11:07
Date Received: 03/21/19 14:49

Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			04/01/19 23:58	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 19:13	03/31/19 03:55	1
Lithium	**0.92**		0.20		mg/L		03/26/19 19:13	03/31/19 03:55	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 05:36	1
Arsenic	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 05:36	1
Barium	**0.020**		0.00050		mg/L		03/26/19 11:38	04/11/19 13:22	1
Cadmium	**0.00015**		0.00010		mg/L		03/26/19 11:38	03/30/19 05:36	1
Chromium	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 05:36	1
Cobalt	**0.0020**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:36	1
Lead	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 05:36	1
Molybdenum	**0.036**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:36	1
Selenium	**0.00071**		0.00050		mg/L		03/26/19 11:38	03/30/19 05:36	1
Thallium	**0.00018**		0.00010		mg/L		03/26/19 11:38	03/30/19 05:36	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/03/19 16:26	04/04/19 10:46	1

Client Sample ID: FC-CCR-DMX6-031919

Lab Sample ID: 550-119829-2

Date Collected: 03/19/19 18:40
Date Received: 03/21/19 14:49

Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			04/02/19 00:53	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 19:13	03/31/19 04:01	1
Lithium	**1.0**		0.20		mg/L		03/26/19 19:13	03/31/19 04:01	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 06:03	1
Arsenic	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 06:03	1
Barium	**0.011**		0.00050		mg/L		04/05/19 07:40	04/09/19 22:41	1
Cadmium	**0.00015**		0.00010		mg/L		03/26/19 11:38	03/30/19 06:03	1
Chromium	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 06:03	1
Cobalt	**0.0011**		0.00050		mg/L		03/26/19 11:38	03/30/19 06:03	1
Lead	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 06:03	1
Molybdenum	**0.051**		0.00050		mg/L		03/26/19 11:38	03/30/19 06:03	1
Selenium	**0.00050**		0.00050		mg/L		03/26/19 11:38	03/30/19 06:03	1
Thallium	ND		0.00010		mg/L		03/26/19 11:38	03/30/19 06:03	1

Client Sample ID: FC-CCR-DMX6-031919

Lab Sample ID: 550-119829-2

Date Collected: 03/19/19 18:40
Matrix: Water
Date Received: 03/21/19 14:49

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/03/19 16:26	04/04/19 10:47	1

Client Sample ID: FC-CCR-MW16-032019

Lab Sample ID: 550-119829-3

Date Collected: 03/20/19 12:04
Matrix: Water
Date Received: 03/21/19 14:49

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			04/02/19 01:11	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 19:13	03/31/19 04:07	1
Lithium	**1.2**		0.20		mg/L		03/26/19 19:13	03/31/19 04:07	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 07:14	1
Arsenic	**0.0018**		0.00050		mg/L		03/26/19 11:38	03/30/19 07:14	1
Barium	**0.021**		0.00050		mg/L		04/05/19 07:40	04/09/19 22:46	1
Cadmium	**0.00015**		0.00010		mg/L		03/26/19 11:38	03/30/19 07:14	1
Chromium	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 07:14	1
Cobalt	**0.0062**		0.00050		mg/L		03/26/19 11:38	03/30/19 07:14	1
Lead	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 07:14	1
Molybdenum	**0.0033**		0.00050		mg/L		03/26/19 11:38	03/30/19 07:14	1
Selenium	**0.045**		0.00050		mg/L		03/26/19 11:38	03/30/19 07:14	1
Thallium	**0.00041**		0.00010		mg/L		03/26/19 11:38	03/30/19 07:14	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/03/19 16:26	04/04/19 10:49	1

Client Sample ID: FC-CCR-MW56-032019

Lab Sample ID: 550-119829-4

Date Collected: 03/20/19 15:17
Matrix: Water
Date Received: 03/21/19 14:49

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			04/03/19 06:37	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 19:13	03/31/19 04:13	1
Lithium	**1.2**		0.20		mg/L		03/26/19 19:13	03/31/19 04:13	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 07:17	1
Arsenic	**0.0084**		0.00050		mg/L		03/26/19 11:38	03/30/19 07:17	1
Barium	**0.021**		0.00050		mg/L		04/05/19 07:40	04/09/19 22:50	1
Cadmium	**0.00011**		0.00010		mg/L		03/26/19 11:38	03/30/19 07:17	1
Chromium	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 07:17	1

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119829-1

Client Sample ID: FC-CCR-MW56-032019

Lab Sample ID: 550-119829-4

Date Collected: 03/20/19 15:17
Matrix: Water
Date Received: 03/21/19 14:49

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	**0.00075**		0.00050		mg/L		03/26/19 11:38	03/30/19 07:17	1
Lead	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 07:17	1
Molybdenum	**0.089**		0.00050		mg/L		03/26/19 11:38	03/30/19 07:17	1
Selenium	**0.21**		0.00050		mg/L		03/26/19 11:38	03/30/19 07:17	1
Thallium	**0.00075**		0.00010		mg/L		03/26/19 11:38	03/30/19 07:17	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/03/19 16:26	04/04/19 10:51	1

Client Sample ID: FC-CCR-DMX4-031919

Lab Sample ID: 550-119829-5

Date Collected: 03/19/19 10:56
Matrix: Water
Date Received: 03/21/19 14:49

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			04/02/19 01:48	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 19:13	03/31/19 04:19	1
Lithium	**0.66**		0.20		mg/L		03/26/19 19:13	03/31/19 04:19	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 12:05	03/30/19 07:19	1
Arsenic	**0.00084**		0.00050		mg/L		03/26/19 12:05	03/30/19 07:19	1
Barium	**0.0097**		0.00050		mg/L		04/05/19 07:40	04/09/19 22:54	1
Cadmium	ND		0.00010		mg/L		03/26/19 12:05	03/30/19 07:19	1
Chromium	ND		0.0010		mg/L		03/26/19 12:05	03/30/19 07:19	1
Cobalt	**0.0028**		0.00050		mg/L		03/26/19 12:05	03/30/19 07:19	1
Lead	ND		0.00050		mg/L		03/26/19 12:05	03/30/19 07:19	1
Molybdenum	**0.016**		0.00050		mg/L		03/26/19 12:05	03/30/19 07:19	1
Selenium	**0.0033**		0.00050		mg/L		03/26/19 12:05	03/30/19 07:19	1
Thallium	**0.00028**		0.00010		mg/L		03/26/19 12:05	03/30/19 07:19	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/03/19 16:26	04/04/19 10:52	1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 550-173744/2
Matrix: Water
Analysis Batch: 173744

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.40		mg/L			04/01/19 17:49	1

Lab Sample ID: LCS 550-173744/5
Matrix: Water
Analysis Batch: 173744

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride			4.00	3.99		mg/L		100	90 - 110		

Lab Sample ID: LCSD 550-173744/6
Matrix: Water
Analysis Batch: 173744

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride			4.00	4.01		mg/L		100	90 - 110	0	20

Lab Sample ID: 550-119829-1 MS
Matrix: Water
Analysis Batch: 173744

Client Sample ID: FC-CCR-MW15-032019
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride	ND	D1 D5	8.00	7.80	D1	mg/L		95	80 - 120		

Lab Sample ID: 550-119829-1 MSD
Matrix: Water
Analysis Batch: 173744

Client Sample ID: FC-CCR-MW15-032019
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	ND	D1 D5	8.00	7.86	D1	mg/L		96	80 - 120	1	20

Lab Sample ID: MB 550-173849/2
Matrix: Water
Analysis Batch: 173849

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.40		mg/L			04/02/19 17:22	1

Lab Sample ID: LCS 550-173849/5
Matrix: Water
Analysis Batch: 173849

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride			4.00	4.06		mg/L		101	90 - 110		

Lab Sample ID: LCSD 550-173849/6
Matrix: Water
Analysis Batch: 173849

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride			4.00	4.07		mg/L		102	90 - 110	0	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: 550-120288-A-1 MS
Matrix: Water
Analysis Batch: 173849

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride	3.5		4.00	7.64		mg/L		103	80 - 120		

Lab Sample ID: 550-120288-A-1 MSD
Matrix: Water
Analysis Batch: 173849

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	3.5		4.00	7.66		mg/L		103	80 - 120	0	20

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 550-173037/1-A
Matrix: Water
Analysis Batch: 173639

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 173037

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 19:13	03/31/19 03:35	1
Lithium	ND		0.20		mg/L		03/26/19 19:13	03/31/19 03:35	1

Lab Sample ID: LCS 550-173037/2-A
Matrix: Water
Analysis Batch: 173639

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 173037

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Beryllium			1.00	0.880		mg/L		88	85 - 115		
Lithium			1.00	0.864		mg/L		86	85 - 115		

Lab Sample ID: LCSD 550-173037/3-A
Matrix: Water
Analysis Batch: 173639

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 173037

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Beryllium			1.00	0.911		mg/L		91	85 - 115	3	20
Lithium			1.00	0.899		mg/L		90	85 - 115	4	20

Lab Sample ID: 550-119829-1 MS
Matrix: Water
Analysis Batch: 173639

Client Sample ID: FC-CCR-MW15-032019
Prep Type: Total/NA
Prep Batch: 173037

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Beryllium	ND		1.00	0.879		mg/L		88	70 - 130		
Lithium	0.92		1.00	1.81		mg/L		89	70 - 130		

Lab Sample ID: 550-119829-1 MSD
Matrix: Water
Analysis Batch: 173639

Client Sample ID: FC-CCR-MW15-032019
Prep Type: Total/NA
Prep Batch: 173037

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Beryllium	ND		1.00	0.883		mg/L		88	70 - 130	0	20
Lithium	0.92		1.00	1.84		mg/L		93	70 - 130	2	20

Method: 200.8 LL - Metals (ICP/MS)

Lab Sample ID: MB 550-172990/1-A
Matrix: Water
Analysis Batch: 173519

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 172990

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 05:19	1
Arsenic	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 05:19	1
Cadmium	ND		0.00010		mg/L		03/26/19 11:38	03/30/19 05:19	1
Chromium	ND		0.0010		mg/L		03/26/19 11:38	03/30/19 05:19	1
Cobalt	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 05:19	1
Lead	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 05:19	1
Molybdenum	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 05:19	1
Selenium	ND		0.00050		mg/L		03/26/19 11:38	03/30/19 05:19	1
Thallium	ND		0.00010		mg/L		03/26/19 11:38	03/30/19 05:19	1

Lab Sample ID: MB 550-172990/1-A
Matrix: Water
Analysis Batch: 174751

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 172990

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Barium	ND		0.00050		mg/L		03/26/19 11:38	04/11/19 13:05	1

Lab Sample ID: LCS 550-172990/2-A
Matrix: Water
Analysis Batch: 173519

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 172990

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Antimony			0.100	0.104		mg/L		104	85 - 115		
Arsenic			0.100	0.104		mg/L		104	85 - 115		
Cadmium			0.100	0.102		mg/L		102	85 - 115		
Chromium			0.100	0.0996		mg/L		100	85 - 115		
Cobalt			0.100	0.0995		mg/L		100	85 - 115		
Lead			0.100	0.103		mg/L		103	85 - 115		
Molybdenum			0.100	0.100		mg/L		100	85 - 115		
Selenium			0.100	0.104		mg/L		104	85 - 115		
Thallium			0.100	0.105		mg/L		105	85 - 115		

Lab Sample ID: LCSD 550-172990/3-A
Matrix: Water
Analysis Batch: 173519

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 172990

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony			0.100	0.108		mg/L		108	85 - 115	4	20
Arsenic			0.100	0.107		mg/L		107	85 - 115	3	20
Cadmium			0.100	0.104		mg/L		104	85 - 115	3	20
Chromium			0.100	0.103		mg/L		103	85 - 115	3	20
Cobalt			0.100	0.103		mg/L		103	85 - 115	3	20
Lead			0.100	0.107		mg/L		107	85 - 115	4	20
Molybdenum			0.100	0.104		mg/L		104	85 - 115	3	20
Selenium			0.100	0.107		mg/L		107	85 - 115	3	20
Thallium			0.100	0.108		mg/L		108	85 - 115	3	20

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Lab Sample ID: 550-119824-B-1-A MS
Matrix: Water
Analysis Batch: 173519

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 172990

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	ND		0.100	0.104		mg/L		104	70 - 130
Arsenic	0.0011		0.100	0.123		mg/L		122	70 - 130
Cadmium	ND		0.100	0.0919		mg/L		92	70 - 130
Chromium	0.0036		0.100	0.107		mg/L		103	70 - 130
Cobalt	ND		0.100	0.0963		mg/L		96	70 - 130
Lead	ND		0.100	0.0858		mg/L		86	70 - 130
Molybdenum	0.15		0.100	0.253		mg/L		101	70 - 130
Selenium	0.0018	M1	0.100	0.166	M1	mg/L		164	70 - 130
Thallium	0.00083		0.100	0.0908		mg/L		90	70 - 130

Lab Sample ID: 550-119824-B-1-B MSD
Matrix: Water
Analysis Batch: 173519

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 172990

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	ND		0.100	0.105		mg/L		105	70 - 130	0	20
Arsenic	0.0011		0.100	0.122		mg/L		121	70 - 130	1	20
Cadmium	ND		0.100	0.0917		mg/L		92	70 - 130	0	20
Chromium	0.0036		0.100	0.105		mg/L		102	70 - 130	1	20
Cobalt	ND		0.100	0.0941		mg/L		94	70 - 130	2	20
Lead	ND		0.100	0.0854		mg/L		85	70 - 130	0	20
Molybdenum	0.15		0.100	0.252		mg/L		100	70 - 130	0	20
Selenium	0.0018	M1	0.100	0.162	M1	mg/L		161	70 - 130	2	20
Thallium	0.00083		0.100	0.0896		mg/L		89	70 - 130	1	20

Lab Sample ID: 550-119829-1 MS
Matrix: Water
Analysis Batch: 173519

Client Sample ID: FC-CCR-MW15-032019
Prep Type: Total/NA
Prep Batch: 172990

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	ND		0.100	0.104		mg/L		104	70 - 130
Arsenic	ND		0.100	0.119		mg/L		119	70 - 130
Cadmium	0.00017		0.100	0.0900		mg/L		90	70 - 130
Chromium	ND		0.100	0.103		mg/L		103	70 - 130
Cobalt	0.0021		0.100	0.0956		mg/L		94	70 - 130
Lead	ND		0.100	0.0909		mg/L		90	70 - 130
Molybdenum	0.035		0.100	0.141		mg/L		106	70 - 130
Selenium	0.00051		0.100	0.153	M1	mg/L		153	70 - 130
Thallium	0.00019		0.100	0.0887		mg/L		89	70 - 130

Lab Sample ID: 550-119829-1 MS
Matrix: Water
Analysis Batch: 174751

Client Sample ID: FC-CCR-MW15-032019
Prep Type: Total/NA
Prep Batch: 172990

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Barium	0.020		0.100	0.139		mg/L		119	70 - 130

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Lab Sample ID: 550-119829-1 MSD — **Client Sample ID: FC-CCR-MW15-032019**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 173519 — **Prep Batch: 172990**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	ND		0.100	0.104		mg/L		104	70 - 130	5	20
Arsenic	ND		0.100	0.121		mg/L		120	70 - 130	10	20
Cadmium	0.00017		0.100	0.0900		mg/L		90	70 - 130	3	20
Chromium	ND		0.100	0.103		mg/L		103	70 - 130	1	20
Cobalt	0.0021		0.100	0.0968		mg/L		95	70 - 130	2	20
Lead	ND		0.100	0.0863		mg/L		86	70 - 130	1	20
Molybdenum	0.035		0.100	0.139		mg/L		104	70 - 130	3	20
Selenium	0.00051		0.100	0.150	M1	mg/L		149	70 - 130	7	20
Thallium	0.00019		0.100	0.0882		mg/L		88	70 - 130	4	20

Lab Sample ID: 550-119829-1 MSD — **Client Sample ID: FC-CCR-MW15-032019**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 174751 — **Prep Batch: 172990**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Barium	0.020		0.100	0.148		mg/L		128	70 - 130	6	20

Lab Sample ID: MB 550-174091/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 174337 — **Prep Batch: 174091**

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Barium	ND		0.00050		mg/L		04/05/19 07:40	04/05/19 23:22	1

Lab Sample ID: LCS 550-174091/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 174337 — **Prep Batch: 174091**

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Barium			0.100	0.103		mg/L		103	85 - 115		

Lab Sample ID: LCSD 550-174091/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 174337 — **Prep Batch: 174091**

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Barium			0.100	0.105		mg/L		105	85 - 115	1	20

Lab Sample ID: 550-119758-H-1-F MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 174337 — **Prep Batch: 174091**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Barium	0.040		0.100	0.144		mg/L		104	70 - 130		

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Lab Sample ID: 550-119758-H-1-G MSD
Matrix: Water
Analysis Batch: 174337

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 174091

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Barium	0.040		0.100	0.145		mg/L		105	70 - 130	1	20

Method: 245.1 - Mercury (CVAA)

Lab Sample ID: MB 550-173906/12-A
Matrix: Water
Analysis Batch: 174009

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 173906

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/03/19 16:26	04/04/19 10:36	1

Lab Sample ID: LCS 550-173906/13-A
Matrix: Water
Analysis Batch: 174009

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 173906

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Hg			0.00500	0.00513		mg/L		103	85 - 115		

Lab Sample ID: LCSD 550-173906/14-A
Matrix: Water
Analysis Batch: 174009

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 173906

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Hg			0.00500	0.00495		mg/L		99	85 - 115	4	20

Lab Sample ID: 550-119833-B-3-C MS
Matrix: Water
Analysis Batch: 174009

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 173906

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Hg	ND		0.00500	0.00393		mg/L		79	70 - 130		

Lab Sample ID: 550-119833-B-3-D MSD
Matrix: Water
Analysis Batch: 174009

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 173906

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Hg	ND		0.00500	0.00434		mg/L		87	70 - 130	10	20

QC Association Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119829-1

HPLC/IC

Analysis Batch: 173744

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119829-1	FC-CCR-MW15-032019	Total/NA	Water	300.0	
550-119829-2	FC-CCR-DMX6-031919	Total/NA	Water	300.0	
550-119829-3	FC-CCR-MW16-032019	Total/NA	Water	300.0	
550-119829-5	FC-CCR-DMX4-031919	Total/NA	Water	300.0	
MB 550-173744/2	Method Blank	Total/NA	Water	300.0	
LCS 550-173744/5	Lab Control Sample	Total/NA	Water	300.0	
LCSD 550-173744/6	Lab Control Sample Dup	Total/NA	Water	300.0	
550-119829-1 MS	FC-CCR-MW15-032019	Total/NA	Water	300.0	
550-119829-1 MSD	FC-CCR-MW15-032019	Total/NA	Water	300.0	

Analysis Batch: 173849

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119829-4	FC-CCR-MW56-032019	Total/NA	Water	300.0	
MB 550-173849/2	Method Blank	Total/NA	Water	300.0	
LCS 550-173849/5	Lab Control Sample	Total/NA	Water	300.0	
LCSD 550-173849/6	Lab Control Sample Dup	Total/NA	Water	300.0	
550-120288-A-1 MS	Matrix Spike	Total/NA	Water	300.0	
550-120288-A-1 MSD	Matrix Spike Duplicate	Total/NA	Water	300.0	

Metals

Prep Batch: 172990

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119829-1	FC-CCR-MW15-032019	Total/NA	Water	200.8	
550-119829-2	FC-CCR-DMX6-031919	Total/NA	Water	200.8	
550-119829-3	FC-CCR-MW16-032019	Total/NA	Water	200.8	
550-119829-4	FC-CCR-MW56-032019	Total/NA	Water	200.8	
550-119829-5	FC-CCR-DMX4-031919	Total/NA	Water	200.8	
MB 550-172990/1-A	Method Blank	Total/NA	Water	200.8	
LCS 550-172990/2-A	Lab Control Sample	Total/NA	Water	200.8	
LCSD 550-172990/3-A	Lab Control Sample Dup	Total/NA	Water	200.8	
550-119824-B-1-A MS	Matrix Spike	Total/NA	Water	200.8	
550-119824-B-1-B MSD	Matrix Spike Duplicate	Total/NA	Water	200.8	
550-119829-1 MS	FC-CCR-MW15-032019	Total/NA	Water	200.8	
550-119829-1 MSD	FC-CCR-MW15-032019	Total/NA	Water	200.8	

Prep Batch: 173037

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119829-1	FC-CCR-MW15-032019	Total/NA	Water	200.7	
550-119829-2	FC-CCR-DMX6-031919	Total/NA	Water	200.7	
550-119829-3	FC-CCR-MW16-032019	Total/NA	Water	200.7	
550-119829-4	FC-CCR-MW56-032019	Total/NA	Water	200.7	
550-119829-5	FC-CCR-DMX4-031919	Total/NA	Water	200.7	
MB 550-173037/1-A	Method Blank	Total/NA	Water	200.7	
LCS 550-173037/2-A	Lab Control Sample	Total/NA	Water	200.7	
LCSD 550-173037/3-A	Lab Control Sample Dup	Total/NA	Water	200.7	
550-119829-1 MS	FC-CCR-MW15-032019	Total/NA	Water	200.7	
550-119829-1 MSD	FC-CCR-MW15-032019	Total/NA	Water	200.7	

QC Association Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119829-1

Metals

Analysis Batch: 173519

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119829-1	FC-CCR-MW15-032019	Total/NA	Water	200.8 LL	172990
550-119829-2	FC-CCR-DMX6-031919	Total/NA	Water	200.8 LL	172990
MB 550-172990/1-A	Method Blank	Total/NA	Water	200.8 LL	172990
LCS 550-172990/2-A	Lab Control Sample	Total/NA	Water	200.8 LL	172990
LCSD 550-172990/3-A	Lab Control Sample Dup	Total/NA	Water	200.8 LL	172990
550-119824-B-1-A MS	Matrix Spike	Total/NA	Water	200.8 LL	172990
550-119824-B-1-B MSD	Matrix Spike Duplicate	Total/NA	Water	200.8 LL	172990
550-119829-1 MS	FC-CCR-MW15-032019	Total/NA	Water	200.8 LL	172990
550-119829-1 MSD	FC-CCR-MW15-032019	Total/NA	Water	200.8 LL	172990

Analysis Batch: 173570

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119829-3	FC-CCR-MW16-032019	Total/NA	Water	200.8 LL	172990
550-119829-4	FC-CCR-MW56-032019	Total/NA	Water	200.8 LL	172990
550-119829-5	FC-CCR-DMX4-031919	Total/NA	Water	200.8 LL	172990

Analysis Batch: 173639

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119829-1	FC-CCR-MW15-032019	Total/NA	Water	200.7 Rev 4.4	173037
550-119829-2	FC-CCR-DMX6-031919	Total/NA	Water	200.7 Rev 4.4	173037
550-119829-3	FC-CCR-MW16-032019	Total/NA	Water	200.7 Rev 4.4	173037
550-119829-4	FC-CCR-MW56-032019	Total/NA	Water	200.7 Rev 4.4	173037
550-119829-5	FC-CCR-DMX4-031919	Total/NA	Water	200.7 Rev 4.4	173037
MB 550-173037/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	173037
LCS 550-173037/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	173037
LCSD 550-173037/3-A	Lab Control Sample Dup	Total/NA	Water	200.7 Rev 4.4	173037
550-119829-1 MS	FC-CCR-MW15-032019	Total/NA	Water	200.7 Rev 4.4	173037
550-119829-1 MSD	FC-CCR-MW15-032019	Total/NA	Water	200.7 Rev 4.4	173037

Prep Batch: 173906

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119829-1	FC-CCR-MW15-032019	Total/NA	Water	245.1	
550-119829-2	FC-CCR-DMX6-031919	Total/NA	Water	245.1	
550-119829-3	FC-CCR-MW16-032019	Total/NA	Water	245.1	
550-119829-4	FC-CCR-MW56-032019	Total/NA	Water	245.1	
550-119829-5	FC-CCR-DMX4-031919	Total/NA	Water	245.1	
MB 550-173906/12-A	Method Blank	Total/NA	Water	245.1	
LCS 550-173906/13-A	Lab Control Sample	Total/NA	Water	245.1	
LCSD 550-173906/14-A	Lab Control Sample Dup	Total/NA	Water	245.1	
550-119833-B-3-C MS	Matrix Spike	Total/NA	Water	245.1	
550-119833-B-3-D MSD	Matrix Spike Duplicate	Total/NA	Water	245.1	

Analysis Batch: 174009

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119829-1	FC-CCR-MW15-032019	Total/NA	Water	245.1	173906
550-119829-2	FC-CCR-DMX6-031919	Total/NA	Water	245.1	173906
550-119829-3	FC-CCR-MW16-032019	Total/NA	Water	245.1	173906
550-119829-4	FC-CCR-MW56-032019	Total/NA	Water	245.1	173906
550-119829-5	FC-CCR-DMX4-031919	Total/NA	Water	245.1	173906
MB 550-173906/12-A	Method Blank	Total/NA	Water	245.1	173906
LCS 550-173906/13-A	Lab Control Sample	Total/NA	Water	245.1	173906

Metals (Continued)

Analysis Batch: 174009 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 550-173906/14-A	Lab Control Sample Dup	Total/NA	Water	245.1	173906
550-119833-B-3-C MS	Matrix Spike	Total/NA	Water	245.1	173906
550-119833-B-3-D MSD	Matrix Spike Duplicate	Total/NA	Water	245.1	173906

Prep Batch: 174091

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119829-2	FC-CCR-DMX6-031919	Total/NA	Water	200.8	
550-119829-3	FC-CCR-MW16-032019	Total/NA	Water	200.8	
550-119829-4	FC-CCR-MW56-032019	Total/NA	Water	200.8	
550-119829-5	FC-CCR-DMX4-031919	Total/NA	Water	200.8	
MB 550-174091/1-A	Method Blank	Total/NA	Water	200.8	
LCS 550-174091/2-A	Lab Control Sample	Total/NA	Water	200.8	
LCSD 550-174091/3-A	Lab Control Sample Dup	Total/NA	Water	200.8	
550-119758-H-1-F MS	Matrix Spike	Total/NA	Water	200.8	
550-119758-H-1-G MSD	Matrix Spike Duplicate	Total/NA	Water	200.8	

Analysis Batch: 174337

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 550-174091/1-A	Method Blank	Total/NA	Water	200.8 LL	174091
LCS 550-174091/2-A	Lab Control Sample	Total/NA	Water	200.8 LL	174091
LCSD 550-174091/3-A	Lab Control Sample Dup	Total/NA	Water	200.8 LL	174091
550-119758-H-1-F MS	Matrix Spike	Total/NA	Water	200.8 LL	174091
550-119758-H-1-G MSD	Matrix Spike Duplicate	Total/NA	Water	200.8 LL	174091

Analysis Batch: 174472

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119829-2	FC-CCR-DMX6-031919	Total/NA	Water	200.8 LL	174091
550-119829-3	FC-CCR-MW16-032019	Total/NA	Water	200.8 LL	174091
550-119829-4	FC-CCR-MW56-032019	Total/NA	Water	200.8 LL	174091
550-119829-5	FC-CCR-DMX4-031919	Total/NA	Water	200.8 LL	174091

Analysis Batch: 174751

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119829-1	FC-CCR-MW15-032019	Total/NA	Water	200.8 LL	172990
MB 550-172990/1-A	Method Blank	Total/NA	Water	200.8 LL	172990
550-119829-1 MS	FC-CCR-MW15-032019	Total/NA	Water	200.8 LL	172990
550-119829-1 MSD	FC-CCR-MW15-032019	Total/NA	Water	200.8 LL	172990

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119829-1

Client Sample ID: FC-CCR-MW15-032019

Lab Sample ID: 550-119829-1

Date Collected: 03/20/19 11:07

Matrix: Water

Date Received: 03/21/19 14:49

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	173744	04/01/19 23:58	NEL	TAL PHX

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			173037	03/26/19 19:13	BCV	TAL PHX
Total/NA	Prep	200.7			173037	03/26/19 19:13	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173639	03/31/19 03:55	SRA	TAL PHX
Total/NA	Prep	200.8			172990	03/26/19 11:38	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	173519	03/30/19 05:36	ARE	TAL PHX
Total/NA	Prep	200.8			172990	03/26/19 11:38	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174751	04/11/19 13:22	ARE	TAL PHX
Total/NA	Prep	245.1			173906	04/03/19 16:26	JTG	TAL PHX
Total/NA	Analysis	245.1		1	174009	04/04/19 10:46	JTG	TAL PHX

Client Sample ID: FC-CCR-DMX6-031919

Lab Sample ID: 550-119829-2

Date Collected: 03/19/19 18:40

Matrix: Water

Date Received: 03/21/19 14:49

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	173744	04/02/19 00:53	NEL	TAL PHX
Total/NA	Prep	200.7			173037	03/26/19 19:13	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173639	03/31/19 04:01	SRA	TAL PHX
Total/NA	Prep	200.8			172990	03/26/19 11:38	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	173519	03/30/19 06:03	ARE	TAL PHX
Total/NA	Prep	200.8			174091	04/05/19 07:40	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174472	04/09/19 22:41	ARE	TAL PHX
Total/NA	Prep	245.1			173906	04/03/19 16:26	JTG	TAL PHX
Total/NA	Analysis	245.1		1	174009	04/04/19 10:47	JTG	TAL PHX

Client Sample ID: FC-CCR-MW16-032019

Lab Sample ID: 550-119829-3

Date Collected: 03/20/19 12:04

Matrix: Water

Date Received: 03/21/19 14:49

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	173744	04/02/19 01:11	NEL	TAL PHX
Total/NA	Prep	200.7			173037	03/26/19 19:13	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173639	03/31/19 04:07	SRA	TAL PHX
Total/NA	Prep	200.8			172990	03/26/19 11:38	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	173570	03/30/19 07:14	ARE	TAL PHX
Total/NA	Prep	200.8			174091	04/05/19 07:40	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174472	04/09/19 22:46	ARE	TAL PHX
Total/NA	Prep	245.1			173906	04/03/19 16:26	JTG	TAL PHX
Total/NA	Analysis	245.1		1	174009	04/04/19 10:49	JTG	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119829-1

Client Sample ID: FC-CCR-MW56-032019

Lab Sample ID: 550-119829-4

Date Collected: 03/20/19 15:17

Matrix: Water

Date Received: 03/21/19 14:49

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	173849	04/03/19 06:37	NEL	TAL PHX
Total/NA	Prep	200.7			173037	03/26/19 19:13	BCV	TAL PHX
Total/NA	Prep	200.7			173037	03/26/19 19:13	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173639	03/31/19 04:13	SRA	TAL PHX
Total/NA	Prep	200.8			172990	03/26/19 11:38	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	173570	03/30/19 07:17	ARE	TAL PHX
Total/NA	Prep	200.8			174091	04/05/19 07:40	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174472	04/09/19 22:50	ARE	TAL PHX
Total/NA	Prep	245.1			173906	04/03/19 16:26	JTG	TAL PHX
Total/NA	Analysis	245.1		1	174009	04/04/19 10:51	JTG	TAL PHX

Client Sample ID: FC-CCR-DMX4-031919

Lab Sample ID: 550-119829-5

Date Collected: 03/19/19 10:56

Matrix: Water

Date Received: 03/21/19 14:49

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	173744	04/02/19 01:48	NEL	TAL PHX
Total/NA	Prep	200.7			173037	03/26/19 19:13	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173639	03/31/19 04:19	SRA	TAL PHX
Total/NA	Prep	200.8			172990	03/26/19 12:05	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	173570	03/30/19 07:19	ARE	TAL PHX
Total/NA	Prep	200.8			174091	04/05/19 07:40	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174472	04/09/19 22:54	ARE	TAL PHX
Total/NA	Prep	245.1			173906	04/03/19 16:26	JTG	TAL PHX
Total/NA	Analysis	245.1		1	174009	04/04/19 10:52	JTG	TAL PHX

Laboratory References:

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

Accreditation/Certification Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119829-1

Laboratory: Eurofins TestAmerica, Phoenix

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Arizona	State Program	9	AZ0728	06-09-19

Method Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119829-1

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL PHX
200.7 Rev 4.4	Metals (ICP)	40CFR136A	TAL PHX
200.8 LL	Metals (ICP/MS)	EPA	TAL PHX
245.1	Mercury (CVAA)	EPA	TAL PHX
200.7	Preparation, Total Metals	EPA	TAL PHX
200.8	Preparation, Total Metals	EPA	TAL PHX
245.1	Preparation, Mercury	EPA	TAL PHX

Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.
EPA = US Environmental Protection Agency
MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

Laboratory References:

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

TestAmerica Phoenix
4645 E Cotton Ctr Blvd Bdg 3
Phoenix, AZ 85040
phone 602.437.3340 fax 623.445.6192

119829

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Doug Lavarnway	Site Contact: Doug Lavarnway	Date: 03/21/19	COC No:
APS Four Corners	Tel/Fax: 928-587-0319	Lab Contact: Ken Baker	Carrier:	1 of 1 COCs
PO Box 355, MS 4915	Analysis Turnaround Time			Job No. 42019 2014.****.2
Fruitland, NM 87416	Calendar (C) or Work Days (W) _____			SDG No.
Phone:	TAT if different from Below 7 Days			
Fax:	☐ 2 weeks			
Project Name: CCR	☐ 1 week			
E-Mail Address:	☐ 2 days			
	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	Perform MS / MSD (Y / N)	EPA 200.7 (Be, Li)	200.8 (Sb, As, Ba, Cd, Cr, Co, Pb, Mo, Se, Tl)	Radium 226 + 228 combined	EPA 245.1 (Hg)	EPA 300.0 (F)	Sample Specific Notes:
FC-CCR-MW15- 032019 -01	03/20/19	11:07	G	W		N	N2	X	X	X	X	X	
FC-CCR-DMX6- 031919 -02	03/19/19	18:40	G	W		N	N	X	X	X	X	X	
FC-CCR-MW16- 032019 -03	03/20/19	12:04	G	W		N	N	X	X	X	X	X	
~~FC-CCR-FD02-~~			~~G~~	~~W~~		N		~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	
FC-CCR-MW56- 032019 -04	3/20/19	15:17	G	W		N	N	X	X	X	X	X	
FC-CCR-DMX4- 031919 -05	03/19/19	10:56	G	W		N	N	X	X	X	X	X	

550-119829 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Special Instructions/QC Requirements & Comments:
Method 200.8 with collision cell
Radium to be analyzed by Radiation Safety

2.2/3.1°c

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
	Wood	3/21/19 14:49			
Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Relinquished by	Company	Date/Time	Received by: Lisa Maycock	Company TAPHX	Date/Time 3/21/19 1449

4/18/2019

Login Sample Receipt Checklist

Client: Arizona Public Service Company

Job Number: 550-119829-1

Login Number: 119829
List Number: 1
Creator: Gravlin, Andrea

List Source: Eurofins TestAmerica, Phoenix

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

eurofins | Environment Testing TestAmerica



ANALYTICAL REPORT

Eurofins TestAmerica, Phoenix
4625 East Cotton Ctr Blvd
Suite 189
Phoenix, AZ 85040
Tel: (602)437-3340

Laboratory Job ID: 550-119831-1
Client Project/Site: CCR

For:
Arizona Public Service Company
4801 Cholla Lake Rd
Joseph City, Arizona 86032

Attn: Doug Lavarnway

Authorized for release by:
4/23/2019 3:49:26 PM

Ken Baker, Project Manager II
(602)659-7624
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LINKS

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

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

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Definitions/Glossary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119831-1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
D1	Sample required dilution due to matrix.
D5	Minimum Reporting Limit (MRL) adjusted due to sample dilution; analyte was non-detect in the sample.

Metals

Qualifier	Qualifier Description
D2	Sample required dilution due to high concentration of analyte.
M1	Matrix spike recovery was high, the associated blank spike recovery was acceptable.

Glossary

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

Job ID: 550-119831-1

Laboratory: Eurofins TestAmerica, Phoenix

Narrative

Job Narrative
550-119831-1

Comments
No additional comments.

Receipt
The samples were received on 3/21/2019 2:49 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.2º C and 3.1º C.

Receipt Exceptions

Radium 226 + 228 are requested on the COC.
Client did not provide sample volume for this method.

HPLC/IC
Method(s) 300.0: The following samples were diluted for Fluoride by method EPA 300.0 due to the nature of the sample matrix: FC-CCR-MW84-031719 (550-119831-1), FC-CCR-MW85-032019 (550-119831-2) and FC-CCR-MW86-031819 (550-119831-3). The samples contained high concentrations of Sulfate which exceeded the instrument's maximum column capacity. Fluoride was not detected in the diluted samples. As such, elevated reporting limits (RLs) have been provided and these data have been qualified with D1 and D5 flags.

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

Metals
Method(s) 200.7: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 550-173037.

Method(s) 200.8 LL: The laboratory control sample (LCS) associated with preparation batch 550-172991 and analytical batch 550-175305 was outside acceptance criteria for Barium. Re-extraction could not be performed; therefore, the data have been reported. The batch matrix spike/matrix spike duplicate (MS/MSD) was within acceptance limits and may be used to evaluate matrix performance.

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

Sample Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119831-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
550-119831-1	FC-CCR-MW84-031719	Water	03/17/19 16:21	03/21/19 14:49
550-119831-2	FC-CCR-MW85-032019	Water	03/20/19 17:53	03/21/19 14:49
550-119831-3	FC-CCR-MW86-031819	Water	03/18/19 13:04	03/21/19 14:49

Detection Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119831-1

Client Sample ID: FC-CCR-MW84-031719 — Lab Sample ID: 550-119831-1

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	0.20		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.00065		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.020	D2	0.0050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00021		0.00010		mg/L	1		200.8 LL	Total/NA
Chromium	0.0010		0.0010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0071		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0091		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0036	M1	0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00046		0.00010		mg/L	1		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW85-032019 — Lab Sample ID: 550-119831-2

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	0.25		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0043		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.016		0.00050		mg/L	1		200.8 LL	Total/NA
Chromium	0.0028		0.0010		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0052		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.16		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00023		0.00010		mg/L	1		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW86-031819 — Lab Sample ID: 550-119831-3

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	0.30		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0011		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.016		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00012		0.00010		mg/L	1		200.8 LL	Total/NA
Chromium	0.0025		0.0010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0043		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0028		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0050		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00057		0.00010		mg/L	1		200.8 LL	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119831-1

Client Sample ID: FC-CCR-MW84-031719

Lab Sample ID: 550-119831-1
Date Collected: 03/17/19 16:21
Matrix: Water
Date Received: 03/21/19 14:49

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			04/02/19 02:43	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 19:13	03/31/19 04:25	1
Lithium	**0.20**		0.20		mg/L		03/26/19 19:13	03/31/19 04:25	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:50	04/05/19 17:06	1
Arsenic	**0.00065**		0.00050		mg/L		03/26/19 11:50	04/05/19 17:06	1
Barium	**0.020**	**D2**	0.0050		mg/L		04/18/19 07:36	04/18/19 21:50	1
Cadmium	**0.00021**		0.00010		mg/L		03/26/19 11:50	04/05/19 17:06	1
Chromium	**0.0010**		0.0010		mg/L		03/26/19 11:50	04/05/19 17:06	1
Cobalt	**0.0071**		0.00050		mg/L		03/26/19 11:50	04/05/19 17:06	1
Lead	ND		0.00050		mg/L		03/26/19 11:50	04/05/19 17:06	1
Molybdenum	**0.0091**		0.00050		mg/L		03/26/19 11:50	04/05/19 17:06	1
Selenium	**0.0036**	**M1**	0.00050		mg/L		03/26/19 11:50	04/05/19 17:06	1
Thallium	**0.00046**		0.00010		mg/L		03/26/19 11:50	04/05/19 17:06	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/03/19 16:26	04/04/19 10:54	1

Client Sample ID: FC-CCR-MW85-032019

Lab Sample ID: 550-119831-2
Date Collected: 03/20/19 17:53
Matrix: Water
Date Received: 03/21/19 14:49

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			04/02/19 03:02	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 19:13	03/31/19 04:31	1
Lithium	**0.25**		0.20		mg/L		03/26/19 19:13	03/31/19 04:31	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:50	04/05/19 17:14	1
Arsenic	**0.0043**		0.00050		mg/L		03/26/19 11:50	04/05/19 17:14	1
Barium	**0.016**		0.00050		mg/L		04/18/19 07:36	04/18/19 21:45	1
Cadmium	ND		0.00010		mg/L		03/26/19 11:50	04/05/19 17:14	1
Chromium	**0.0028**		0.0010		mg/L		03/26/19 11:50	04/05/19 17:14	1
Cobalt	ND		0.00050		mg/L		03/26/19 11:50	04/05/19 17:14	1
Lead	ND		0.00050		mg/L		03/26/19 11:50	04/05/19 17:14	1
Molybdenum	**0.0052**		0.00050		mg/L		03/26/19 11:50	04/05/19 17:14	1
Selenium	**0.16**		0.00050		mg/L		03/26/19 11:50	04/05/19 17:14	1
Thallium	**0.00023**		0.00010		mg/L		03/26/19 11:50	04/05/19 17:14	1

Client Sample ID: FC-CCR-MW85-032019

Lab Sample ID: 550-119831-2

Date Collected: 03/20/19 17:53

Matrix: Water

Date Received: 03/21/19 14:49

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/03/19 16:26	04/04/19 10:55	1

Client Sample ID: FC-CCR-MW86-031819

Lab Sample ID: 550-119831-3

Date Collected: 03/18/19 13:04

Matrix: Water

Date Received: 03/21/19 14:49

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			04/02/19 03:20	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 19:13	03/31/19 04:37	1
Lithium	**0.30**		0.20		mg/L		03/26/19 19:13	03/31/19 04:37	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:50	04/05/19 17:16	1
Arsenic	**0.0011**		0.00050		mg/L		03/26/19 11:50	04/05/19 17:16	1
Barium	**0.016**		0.00050		mg/L		04/18/19 07:36	04/18/19 21:47	1
Cadmium	**0.00012**		0.00010		mg/L		03/26/19 11:50	04/05/19 17:16	1
Chromium	**0.0025**		0.0010		mg/L		03/26/19 11:50	04/05/19 17:16	1
Cobalt	**0.0043**		0.00050		mg/L		03/26/19 11:50	04/05/19 17:16	1
Lead	ND		0.00050		mg/L		03/26/19 11:50	04/05/19 17:16	1
Molybdenum	**0.0028**		0.00050		mg/L		03/26/19 11:50	04/05/19 17:16	1
Selenium	**0.0050**		0.00050		mg/L		03/26/19 11:50	04/05/19 17:16	1
Thallium	**0.00057**		0.00010		mg/L		03/26/19 11:50	04/05/19 17:16	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/03/19 16:26	04/04/19 11:03	1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 550-173745/1030
Matrix: Water
Analysis Batch: 173745

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.40		mg/L			04/02/19 02:25	1

Lab Sample ID: LCS 550-173745/50
Matrix: Water
Analysis Batch: 173745

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride			4.00	4.04		mg/L		101	90 - 110		

Lab Sample ID: LCSD 550-173745/51
Matrix: Water
Analysis Batch: 173745

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride			4.00	4.04		mg/L		101	90 - 110	0	20

Lab Sample ID: 550-119831-1 MS
Matrix: Water
Analysis Batch: 173745

Client Sample ID: FC-CCR-MW84-031719
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride	ND	D1 D5	8.00	7.53	D1	mg/L		90	80 - 120		

Lab Sample ID: 550-119831-1 MSD
Matrix: Water
Analysis Batch: 173745

Client Sample ID: FC-CCR-MW84-031719
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	ND	D1 D5	8.00	7.66	D1	mg/L		92	80 - 120	2	20

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 550-173037/1-A
Matrix: Water
Analysis Batch: 173639

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 173037

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 19:13	03/31/19 03:35	1
Lithium	ND		0.20		mg/L		03/26/19 19:13	03/31/19 03:35	1

Lab Sample ID: LCS 550-173037/2-A
Matrix: Water
Analysis Batch: 173639

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 173037

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Beryllium			1.00	0.880		mg/L		88	85 - 115		
Lithium			1.00	0.864		mg/L		86	85 - 115		

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: LCSD 550-173037/3-A
Matrix: Water
Analysis Batch: 173639

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 173037

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Beryllium			1.00	0.911		mg/L		91	85 - 115	3	20
Lithium			1.00	0.899		mg/L		90	85 - 115	4	20

Lab Sample ID: 550-119829-B-1-D MS
Matrix: Water
Analysis Batch: 173639

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 173037

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Beryllium	ND		1.00	0.879		mg/L		88	70 - 130
Lithium	0.92		1.00	1.81		mg/L		89	70 - 130

Lab Sample ID: 550-119829-B-1-E MSD
Matrix: Water
Analysis Batch: 173639

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 173037

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Beryllium	ND		1.00	0.883		mg/L		88	70 - 130	0	20
Lithium	0.92		1.00	1.84		mg/L		93	70 - 130	2	20

Method: 200.8 LL - Metals (ICP/MS)

Lab Sample ID: MB 550-172991/1-A
Matrix: Water
Analysis Batch: 174191

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 172991

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:50	04/05/19 16:56	1
Arsenic	ND		0.00050		mg/L		03/26/19 11:50	04/05/19 16:56	1
Cadmium	ND		0.00010		mg/L		03/26/19 11:50	04/05/19 16:56	1
Chromium	ND		0.0010		mg/L		03/26/19 11:50	04/05/19 16:56	1
Cobalt	ND		0.00050		mg/L		03/26/19 11:50	04/05/19 16:56	1
Lead	ND		0.00050		mg/L		03/26/19 11:50	04/05/19 16:56	1
Molybdenum	ND		0.00050		mg/L		03/26/19 11:50	04/05/19 16:56	1
Selenium	ND		0.00050		mg/L		03/26/19 11:50	04/05/19 16:56	1
Thallium	ND		0.00010		mg/L		03/26/19 11:50	04/05/19 16:56	1

Lab Sample ID: MB 550-172991/1-A
Matrix: Water
Analysis Batch: 175305

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 172991

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Barium	ND		0.00050		mg/L		03/26/19 11:50	04/18/19 02:46	1

Lab Sample ID: LCS 550-172991/2-A
Matrix: Water
Analysis Batch: 174191

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 172991

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony			0.100	0.103		mg/L		103	85 - 115
Arsenic			0.100	0.103		mg/L		103	85 - 115

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 550-172991/2-A
Matrix: Water
Analysis Batch: 174191

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 172991

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cadmium	0.100	0.101		mg/L		101	85 - 115
Chromium	0.100	0.101		mg/L		101	85 - 115
Cobalt	0.100	0.101		mg/L		101	85 - 115
Lead	0.100	0.0964		mg/L		96	85 - 115
Molybdenum	0.100	0.101		mg/L		101	85 - 115
Selenium	0.100	0.101		mg/L		101	85 - 115
Thallium	0.100	0.101		mg/L		101	85 - 115

Lab Sample ID: LCSD 550-172991/3-A
Matrix: Water
Analysis Batch: 174191

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 172991

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	0.100	0.102		mg/L		102	85 - 115	0	20
Arsenic	0.100	0.102		mg/L		102	85 - 115	1	20
Cadmium	0.100	0.101		mg/L		101	85 - 115	0	20
Chromium	0.100	0.101		mg/L		101	85 - 115	0	20
Cobalt	0.100	0.101		mg/L		101	85 - 115	1	20
Lead	0.100	0.0966		mg/L		97	85 - 115	0	20
Molybdenum	0.100	0.101		mg/L		101	85 - 115	0	20
Selenium	0.100	0.102		mg/L		102	85 - 115	1	20
Thallium	0.100	0.101		mg/L		101	85 - 115	0	20

Lab Sample ID: 550-119831-1 MS
Matrix: Water
Analysis Batch: 174191

Client Sample ID: FC-CCR-MW84-031719
Prep Type: Total/NA
Prep Batch: 172991

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	ND		0.100	0.102		mg/L		102	70 - 130
Arsenic	0.00065		0.100	0.124		mg/L		123	70 - 130
Cadmium	0.00021		0.100	0.0905		mg/L		90	70 - 130
Chromium	0.0010		0.100	0.110		mg/L		109	70 - 130
Cobalt	0.0071		0.100	0.102		mg/L		95	70 - 130
Lead	ND		0.100	0.0845		mg/L		85	70 - 130
Molybdenum	0.0091		0.100	0.115		mg/L		106	70 - 130
Selenium	0.0036	M1	0.100	0.167	M1	mg/L		164	70 - 130
Thallium	0.00046		0.100	0.0893		mg/L		89	70 - 130

Lab Sample ID: 550-119831-1 MS
Matrix: Water
Analysis Batch: 175305

Client Sample ID: FC-CCR-MW84-031719
Prep Type: Total/NA
Prep Batch: 172991

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Barium	0.015		0.100	0.0870		mg/L		72	70 - 130

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Lab Sample ID: 550-119831-1 MSD — **Client Sample ID: FC-CCR-MW84-031719**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 174191 — **Prep Batch: 172991**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	ND		0.100	0.0995		mg/L		99	70 - 130	2	20
Arsenic	0.00065		0.100	0.122		mg/L		121	70 - 130	1	20
Cadmium	0.00021		0.100	0.0882		mg/L		88	70 - 130	3	20
Chromium	0.0010		0.100	0.108		mg/L		107	70 - 130	2	20
Cobalt	0.0071		0.100	0.0997		mg/L		93	70 - 130	2	20
Lead	ND		0.100	0.0839		mg/L		84	70 - 130	1	20
Molybdenum	0.0091		0.100	0.112		mg/L		103	70 - 130	3	20
Selenium	0.0036	M1	0.100	0.166	M1	mg/L		162	70 - 130	1	20
Thallium	0.00046		0.100	0.0892		mg/L		89	70 - 130	0	20

Lab Sample ID: 550-119831-1 MSD — **Client Sample ID: FC-CCR-MW84-031719**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 175305 — **Prep Batch: 172991**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Barium	0.015		0.100	0.0860		mg/L		71	70 - 130	1	20

Lab Sample ID: 550-119833-B-1-A MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 175305 — **Prep Batch: 172991**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Barium	0.019	L4	0.100	0.0897		mg/L		71	70 - 130

Lab Sample ID: 550-119833-B-1-B MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 175305 — **Prep Batch: 172991**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Barium	0.019	L4	0.100	0.0900		mg/L		71	70 - 130	0	20

Lab Sample ID: MB 550-175310/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 175447 — **Prep Batch: 175310**

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Barium	ND		0.00050		mg/L		04/18/19 07:36	04/18/19 21:10	1

Lab Sample ID: LCS 550-175310/4-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 175447 — **Prep Batch: 175310**

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Barium			0.100	0.105		mg/L		105	85 - 115

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Lab Sample ID: LCSD 550-175310/5-A
Matrix: Water
Analysis Batch: 175447

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 175310

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Barium			0.100	0.107		mg/L		107	85 - 115	2	20

Lab Sample ID: 550-121243-D-1-A MS
Matrix: Water
Analysis Batch: 175447

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 175310

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Barium	0.10		0.100	0.206		mg/L		103	70 - 130

Lab Sample ID: 550-121243-D-1-B MSD
Matrix: Water
Analysis Batch: 175447

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 175310

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Barium	0.10		0.100	0.213		mg/L		111	70 - 130	4	20

Method: 245.1 - Mercury (CVAA)

Lab Sample ID: MB 550-173906/12-A
Matrix: Water
Analysis Batch: 174009

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 173906

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/03/19 16:26	04/04/19 10:36	1

Lab Sample ID: LCS 550-173906/13-A
Matrix: Water
Analysis Batch: 174009

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 173906

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Hg			0.00500	0.00513		mg/L		103	85 - 115

Lab Sample ID: LCSD 550-173906/14-A
Matrix: Water
Analysis Batch: 174009

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 173906

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Hg			0.00500	0.00495		mg/L		99	85 - 115	4	20

Lab Sample ID: 550-119833-B-3-C MS
Matrix: Water
Analysis Batch: 174009

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 173906

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Hg	ND		0.00500	0.00393		mg/L		79	70 - 130

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119831-1

Method: 245.1 - Mercury (CVAA) (Continued)

Lab Sample ID: 550-119833-B-3-D MSD
Matrix: Water
Analysis Batch: 174009

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 173906

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Hg	ND		0.00500	0.00434		mg/L		87	70 - 130	10	20

QC Association Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119831-1

HPLC/IC

Analysis Batch: 173745

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119831-1	FC-CCR-MW84-031719	Total/NA	Water	300.0	
550-119831-2	FC-CCR-MW85-032019	Total/NA	Water	300.0	
550-119831-3	FC-CCR-MW86-031819	Total/NA	Water	300.0	
MB 550-173745/1030	Method Blank	Total/NA	Water	300.0	
LCS 550-173745/50	Lab Control Sample	Total/NA	Water	300.0	
LCSD 550-173745/51	Lab Control Sample Dup	Total/NA	Water	300.0	
550-119831-1 MS	FC-CCR-MW84-031719	Total/NA	Water	300.0	
550-119831-1 MSD	FC-CCR-MW84-031719	Total/NA	Water	300.0	

Metals

Prep Batch: 172991

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119831-1	FC-CCR-MW84-031719	Total/NA	Water	200.8	
550-119831-2	FC-CCR-MW85-032019	Total/NA	Water	200.8	
550-119831-3	FC-CCR-MW86-031819	Total/NA	Water	200.8	
MB 550-172991/1-A	Method Blank	Total/NA	Water	200.8	
LCS 550-172991/2-A	Lab Control Sample	Total/NA	Water	200.8	
LCSD 550-172991/3-A	Lab Control Sample Dup	Total/NA	Water	200.8	
550-119831-1 MS	FC-CCR-MW84-031719	Total/NA	Water	200.8	
550-119831-1 MSD	FC-CCR-MW84-031719	Total/NA	Water	200.8	
550-119833-B-1-A MS	Matrix Spike	Total/NA	Water	200.8	
550-119833-B-1-B MSD	Matrix Spike Duplicate	Total/NA	Water	200.8	

Prep Batch: 173037

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119831-1	FC-CCR-MW84-031719	Total/NA	Water	200.7	
550-119831-2	FC-CCR-MW85-032019	Total/NA	Water	200.7	
550-119831-3	FC-CCR-MW86-031819	Total/NA	Water	200.7	
MB 550-173037/1-A	Method Blank	Total/NA	Water	200.7	
LCS 550-173037/2-A	Lab Control Sample	Total/NA	Water	200.7	
LCSD 550-173037/3-A	Lab Control Sample Dup	Total/NA	Water	200.7	
550-119829-B-1-D MS	Matrix Spike	Total/NA	Water	200.7	
550-119829-B-1-E MSD	Matrix Spike Duplicate	Total/NA	Water	200.7	

Analysis Batch: 173639

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119831-1	FC-CCR-MW84-031719	Total/NA	Water	200.7 Rev 4.4	173037
550-119831-2	FC-CCR-MW85-032019	Total/NA	Water	200.7 Rev 4.4	173037
550-119831-3	FC-CCR-MW86-031819	Total/NA	Water	200.7 Rev 4.4	173037
MB 550-173037/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	173037
LCS 550-173037/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	173037
LCSD 550-173037/3-A	Lab Control Sample Dup	Total/NA	Water	200.7 Rev 4.4	173037
550-119829-B-1-D MS	Matrix Spike	Total/NA	Water	200.7 Rev 4.4	173037
550-119829-B-1-E MSD	Matrix Spike Duplicate	Total/NA	Water	200.7 Rev 4.4	173037

Prep Batch: 173906

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119831-1	FC-CCR-MW84-031719	Total/NA	Water	245.1	
550-119831-2	FC-CCR-MW85-032019	Total/NA	Water	245.1	
550-119831-3	FC-CCR-MW86-031819	Total/NA	Water	245.1	

Metals (Continued)

Prep Batch: 173906 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 550-173906/12-A	Method Blank	Total/NA	Water	245.1	
LCS 550-173906/13-A	Lab Control Sample	Total/NA	Water	245.1	
LCSD 550-173906/14-A	Lab Control Sample Dup	Total/NA	Water	245.1	
550-119833-B-3-C MS	Matrix Spike	Total/NA	Water	245.1	
550-119833-B-3-D MSD	Matrix Spike Duplicate	Total/NA	Water	245.1	

Analysis Batch: 174009

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119831-1	FC-CCR-MW84-031719	Total/NA	Water	245.1	173906
550-119831-2	FC-CCR-MW85-032019	Total/NA	Water	245.1	173906
550-119831-3	FC-CCR-MW86-031819	Total/NA	Water	245.1	173906
MB 550-173906/12-A	Method Blank	Total/NA	Water	245.1	173906
LCS 550-173906/13-A	Lab Control Sample	Total/NA	Water	245.1	173906
LCSD 550-173906/14-A	Lab Control Sample Dup	Total/NA	Water	245.1	173906
550-119833-B-3-C MS	Matrix Spike	Total/NA	Water	245.1	173906
550-119833-B-3-D MSD	Matrix Spike Duplicate	Total/NA	Water	245.1	173906

Analysis Batch: 174191

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119831-1	FC-CCR-MW84-031719	Total/NA	Water	200.8 LL	172991
550-119831-2	FC-CCR-MW85-032019	Total/NA	Water	200.8 LL	172991
550-119831-3	FC-CCR-MW86-031819	Total/NA	Water	200.8 LL	172991
MB 550-172991/1-A	Method Blank	Total/NA	Water	200.8 LL	172991
LCS 550-172991/2-A	Lab Control Sample	Total/NA	Water	200.8 LL	172991
LCSD 550-172991/3-A	Lab Control Sample Dup	Total/NA	Water	200.8 LL	172991
550-119831-1 MS	FC-CCR-MW84-031719	Total/NA	Water	200.8 LL	172991
550-119831-1 MSD	FC-CCR-MW84-031719	Total/NA	Water	200.8 LL	172991

Analysis Batch: 175305

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 550-172991/1-A	Method Blank	Total/NA	Water	200.8 LL	172991
550-119831-1 MS	FC-CCR-MW84-031719	Total/NA	Water	200.8 LL	172991
550-119831-1 MSD	FC-CCR-MW84-031719	Total/NA	Water	200.8 LL	172991
550-119833-B-1-A MS	Matrix Spike	Total/NA	Water	200.8 LL	172991
550-119833-B-1-B MSD	Matrix Spike Duplicate	Total/NA	Water	200.8 LL	172991

Prep Batch: 175310

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119831-1	FC-CCR-MW84-031719	Total/NA	Water	200.8	
550-119831-2	FC-CCR-MW85-032019	Total/NA	Water	200.8	
550-119831-3	FC-CCR-MW86-031819	Total/NA	Water	200.8	
MB 550-175310/1-A	Method Blank	Total/NA	Water	200.8	
LCS 550-175310/4-A	Lab Control Sample	Total/NA	Water	200.8	
LCSD 550-175310/5-A	Lab Control Sample Dup	Total/NA	Water	200.8	
550-121243-D-1-A MS	Matrix Spike	Total/NA	Water	200.8	
550-121243-D-1-B MSD	Matrix Spike Duplicate	Total/NA	Water	200.8	

Analysis Batch: 175447

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119831-1	FC-CCR-MW84-031719	Total/NA	Water	200.8 LL	175310
550-119831-2	FC-CCR-MW85-032019	Total/NA	Water	200.8 LL	175310

Metals (Continued)

Analysis Batch: 175447 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119831-3	FC-CCR-MW86-031819	Total/NA	Water	200.8 LL	175310
MB 550-175310/1-A	Method Blank	Total/NA	Water	200.8 LL	175310
LCS 550-175310/4-A	Lab Control Sample	Total/NA	Water	200.8 LL	175310
LCSD 550-175310/5-A	Lab Control Sample Dup	Total/NA	Water	200.8 LL	175310
550-121243-D-1-A MS	Matrix Spike	Total/NA	Water	200.8 LL	175310
550-121243-D-1-B MSD	Matrix Spike Duplicate	Total/NA	Water	200.8 LL	175310

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119831-1

Client Sample ID: FC-CCR-MW84-031719
Lab Sample ID: 550-119831-1
Date Collected: 03/17/19 16:21
Matrix: Water
Date Received: 03/21/19 14:49

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	173745	04/02/19 02:43	NEL	TAL PHX
Total/NA	Prep	200.7			173037	03/26/19 19:13	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173639	03/31/19 04:25	SRA	TAL PHX
Total/NA	Prep	200.8			172991	03/26/19 11:50	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174191	04/05/19 17:06	ARE	TAL PHX
Total/NA	Prep	200.8			175310	04/18/19 07:36	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	175447	04/18/19 21:50	ARE	TAL PHX
Total/NA	Prep	245.1			173906	04/03/19 16:26	JTG	TAL PHX
Total/NA	Analysis	245.1		1	174009	04/04/19 10:54	JTG	TAL PHX

Client Sample ID: FC-CCR-MW85-032019
Lab Sample ID: 550-119831-2
Date Collected: 03/20/19 17:53
Matrix: Water
Date Received: 03/21/19 14:49

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	173745	04/02/19 03:02	NEL	TAL PHX
Total/NA	Prep	200.7			173037	03/26/19 19:13	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173639	03/31/19 04:31	SRA	TAL PHX
Total/NA	Prep	200.8			172991	03/26/19 11:50	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174191	04/05/19 17:14	ARE	TAL PHX
Total/NA	Prep	200.8			175310	04/18/19 07:36	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	175447	04/18/19 21:45	ARE	TAL PHX
Total/NA	Prep	245.1			173906	04/03/19 16:26	JTG	TAL PHX
Total/NA	Analysis	245.1		1	174009	04/04/19 10:55	JTG	TAL PHX

Client Sample ID: FC-CCR-MW86-031819
Lab Sample ID: 550-119831-3
Date Collected: 03/18/19 13:04
Matrix: Water
Date Received: 03/21/19 14:49

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	173745	04/02/19 03:20	NEL	TAL PHX
Total/NA	Prep	200.7			173037	03/26/19 19:13	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173639	03/31/19 04:37	SRA	TAL PHX
Total/NA	Prep	200.8			172991	03/26/19 11:50	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174191	04/05/19 17:16	ARE	TAL PHX
Total/NA	Prep	200.8			175310	04/18/19 07:36	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	175447	04/18/19 21:47	ARE	TAL PHX
Total/NA	Prep	245.1			173906	04/03/19 16:26	JTG	TAL PHX
Total/NA	Analysis	245.1		1	174009	04/04/19 11:03	JTG	TAL PHX

Laboratory References:

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

Accreditation/Certification Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119831-1

Laboratory: Eurofins TestAmerica, Phoenix

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Arizona	State Program	9	AZ0728	06-09-19

Method Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119831-1

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL PHX
200.7 Rev 4.4	Metals (ICP)	40CFR136A	TAL PHX
200.8 LL	Metals (ICP/MS)	EPA	TAL PHX
245.1	Mercury (CVAA)	EPA	TAL PHX
200.7	Preparation, Total Metals	EPA	TAL PHX
200.8	Preparation, Total Metals	EPA	TAL PHX
245.1	Preparation, Mercury	EPA	TAL PHX

Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.
EPA = US Environmental Protection Agency
MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

Laboratory References:

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

TestAmerica Phoenix
4645 E Cotton Ctr Blvd Bdg 3
Phoenix, AZ 85040
phone 602.437.3340 fax 623.445.6192

119831

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Doug Lavarnway	Site Contact: Doug Lavarnway	Date: 03/21/19	COC No:
APS Four Corners	Tel/Fax: 928-587-0319	Lab Contact: Ken Baker	Carrier:	1 of 1 COCs
PO Box 355, MS 4915	Analysis Turnaround Time			Job No. 1420192014.****.2
Fruitland, NM 87416	Calendar (C) or Work Days (W)			SDG No.
Phone:	TAT if different from Below 7 Days			
Fax:	☐ 2 weeks			
Project Name: CCR	☐ 1 week			
E-Mail Address:	☐ 2 days			
	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	Perform MS / MSD (Y / N)	EPA 200.7 (Be, Li)	200.8 (Sb, As, Ba, Cd, Cr, Co, Pb, Mo, Se, Tl)	Radium 226 + 228 combined	EPA 245.1 (Hg)	EPA 300.0 (F)	Sample Specific Notes:
FC-CCR-MW84-031719 -01	03/17/19	16:21	G	W	2	N	N	X	X	X	X	X	
FC-CCR-MW85-032019 -02	03/20/19	17:53	G	W	2	N	N	X	X	X	X	X	
FC-CCR-MW86-031819 -03	03/18/19	13:04	G	W	2	N	N	X	X	X	X	X	
~~FC-CCR-FD02-~~			G	W	~~2~~	N		~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	



Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samp... ...retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Special Instructions/QC Requirements & Comments:
Method 200.8 with collision cell
Radium to be analyzed by Radiation Safety

22/3.1c

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
	Wood	3/21/14:49			
Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Relinquished by	Company	Date/Time	Received by	Company	Date/Time
			Josi Maycoed	TA Phx	3/21/19 1449

Login Sample Receipt Checklist

Client: Arizona Public Service Company

Job Number: 550-119831-1

Login Number: 119831
List Number: 1
Creator: Gravlin, Andrea

List Source: Eurofins TestAmerica, Phoenix

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

eurofins | Environment Testing TestAmerica



ANALYTICAL REPORT

Eurofins TestAmerica, Phoenix
4625 East Cotton Ctr Blvd
Suite 189
Phoenix, AZ 85040
Tel: (602)437-3340

Laboratory Job ID: 550-119833-1
Client Project/Site: CCR

For:
Arizona Public Service Company
4801 Cholla Lake Rd
Joseph City, Arizona 86032

Attn: Doug Lavarnway

Authorized for release by:
4/23/2019 4:15:07 PM

Ken Baker, Project Manager II
(602)659-7624
ken.baker@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

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

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

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Definitions/Glossary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119833-1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
D1	Sample required dilution due to matrix.
D5	Minimum Reporting Limit (MRL) adjusted due to sample dilution; analyte was non-detect in the sample.

Metals

Qualifier	Qualifier Description
D2	Sample required dilution due to high concentration of analyte.
M1	Matrix spike recovery was high, the associated blank spike recovery was acceptable.

Glossary

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

Job ID: 550-119833-1

Laboratory: Eurofins TestAmerica, Phoenix

Narrative

Job Narrative
550-119833-1

Receipt
The samples were received on 3/21/2019 2:48 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.2º C and 3.1º C.

Receipt Exceptions
Sample sites are not in TALS for sample site enforcement.

COC is requesting Radium 226 + 228.
Client did not provide sample volume for this method.

HPLC/IC
Method(s) 300.0: The following samples were diluted for Fluoride by method EPA 300.0 due to the nature of the sample matrix: FC-CCR-MW72-031719 (550-119833-7), FC-CCR-MW73-031819 (550-119833-8) and FC-CCR-FD01-032019 (550-119833-10). The samples contained high concentrations of Sulfate which exceeded the instrument's maximum column capacity. Fluoride was not detected in the diluted samples. As such, elevated reporting limits (RLs) have been provided and these data have been qualified with D1 and D5 flags.

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

Metals
Method(s) 200.7: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 550-173037.

Method(s) 200.8 LL: The laboratory control sample (LCS) associated with preparation batch 550-172991 and analytical batch 550-175305 was outside acceptance criteria for Barium. Re-extraction could not be performed; therefore, the data have been reported. The batch matrix spike/matrix spike duplicate (MS/MSD) was within acceptance limits and may be used to evaluate matrix performance.

Sample Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119833-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
550-119833-1	FC-CCR-MW66-031819	Water	03/18/19 14:14	03/21/19 14:48
550-119833-2	FC-CCR-MW67-031719	Water	03/17/19 15:05	03/21/19 14:48
550-119833-3	FC-CCR-MW68-031719	Water	03/17/19 12:52	03/21/19 14:48
550-119833-4	FC-CCR-MW69-031719	Water	03/17/19 13:59	03/21/19 14:48
550-119833-5	FC-CCR-MW70-031819	Water	03/18/19 16:04	03/21/19 14:48
550-119833-6	FC-CCR-MW71-031819	Water	03/18/19 11:09	03/21/19 14:48
550-119833-7	FC-CCR-MW72-031719	Water	03/17/19 10:50	03/21/19 14:48
550-119833-8	FC-CCR-MW73-031819	Water	03/18/19 17:40	03/21/19 14:48
550-119833-9	FC-CCR-MW83-031819	Water	03/18/19 09:43	03/21/19 14:48
550-119833-10	FC-CCR-FD01-032019	Water	03/20/19 17:53	03/21/19 14:48

Detection Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119833-1

Client Sample ID: FC-CCR-MW66-031819 — Lab Sample ID: 550-119833-1

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	23	D1	2.0		mg/L	5		300.0	Total/NA
Lithium	0.37		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0012		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.023	D2	0.0050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00016		0.00010		mg/L	1		200.8 LL	Total/NA
Chromium	0.0010		0.0010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.017		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.016		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0024		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.0011		0.00010		mg/L	1		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW67-031719 — Lab Sample ID: 550-119833-2

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	15	D1	2.0		mg/L	5		300.0	Total/NA
Lithium	0.37		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0016		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.014		0.00050		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0058		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.036		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0050		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00086		0.00010		mg/L	1		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW68-031719 — Lab Sample ID: 550-119833-3

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	9.2	D1	2.0		mg/L	5		300.0	Total/NA
Lithium	0.37		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0035		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.0084		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00014		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0026		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0067		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.14		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.0010		0.00010		mg/L	1		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW69-031719 — Lab Sample ID: 550-119833-4

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	3.1	D1	0.80		mg/L	2		300.0	Total/NA
Lithium	0.27		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0032		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.010		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00021		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0031		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.011		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.038		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00020		0.00010		mg/L	1		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW70-031819 — Lab Sample ID: 550-119833-5

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	2.3	D1	0.80		mg/L	2		300.0	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Phoenix

Client Sample ID: FC-CCR-MW70-031819 (Continued) — Lab Sample ID: 550-119833-5

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	0.32		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0054		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.0099		0.00050		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0040		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0057		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.24		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00029		0.00010		mg/L	1		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW71-031819 — Lab Sample ID: 550-119833-6

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	0.32		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0069		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.010		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.00066		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.37		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00031		0.00010		mg/L	1		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW72-031719 — Lab Sample ID: 550-119833-7

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	0.36		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0034		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.0077		0.00050		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0022		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.00095		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.13		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00095		0.00010		mg/L	1		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW73-031819 — Lab Sample ID: 550-119833-8

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	0.26		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.023		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00013		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0038		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0017		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0069		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00025		0.00010		mg/L	1		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW83-031819 — Lab Sample ID: 550-119833-9

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	1.2	D1	0.80		mg/L	2		300.0	Total/NA
Arsenic	0.0023		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.034		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.053		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0012		0.00050		mg/L	1		200.8 LL	Total/NA

Client Sample ID: FC-CCR-FD01-032019 — Lab Sample ID: 550-119833-10

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	0.25		0.20		mg/L	1		200.7 Rev 4.4	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-FD01-032019 (Continued)

Lab Sample ID: 550-119833-10

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.0041		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.017		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0045		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.16		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00023		0.00010		mg/L	1		200.8 LL	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-MW66-031819

Lab Sample ID: 550-119833-1

Date Collected: 03/18/19 14:14

Matrix: Water

Date Received: 03/21/19 14:48

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**23**	**D1**	2.0		mg/L			04/02/19 03:38	5

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 19:13	03/31/19 04:43	1
Lithium	**0.37**		0.20		mg/L		03/26/19 19:13	03/31/19 04:43	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:50	04/05/19 17:12	1
Arsenic	**0.0012**		0.00050		mg/L		03/26/19 11:50	04/05/19 17:12	1
Barium	**0.023**	**D2**	0.0050		mg/L		04/18/19 07:36	04/18/19 21:52	1
Cadmium	**0.00016**		0.00010		mg/L		03/26/19 11:50	04/05/19 17:12	1
Chromium	**0.0010**		0.0010		mg/L		03/26/19 11:50	04/05/19 17:12	1
Cobalt	**0.017**		0.00050		mg/L		03/26/19 11:50	04/05/19 17:12	1
Lead	ND		0.00050		mg/L		03/26/19 11:50	04/05/19 17:12	1
Molybdenum	**0.016**		0.00050		mg/L		03/26/19 11:50	04/05/19 17:12	1
Selenium	**0.0024**		0.00050		mg/L		03/26/19 11:50	04/05/19 17:12	1
Thallium	**0.0011**		0.00010		mg/L		03/26/19 11:50	04/05/19 17:12	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/03/19 16:26	04/04/19 10:57	1

Client Sample ID: FC-CCR-MW67-031719

Lab Sample ID: 550-119833-2

Date Collected: 03/17/19 15:05

Matrix: Water

Date Received: 03/21/19 14:48

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**15**	**D1**	2.0		mg/L			04/02/19 04:34	5

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 19:13	03/31/19 04:54	1
Lithium	**0.37**		0.20		mg/L		03/26/19 19:13	03/31/19 04:54	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:50	04/05/19 17:18	1
Arsenic	**0.0016**		0.00050		mg/L		03/26/19 11:50	04/05/19 17:18	1
Barium	**0.014**		0.00050		mg/L		04/05/19 07:49	04/05/19 22:59	1
Cadmium	ND		0.00010		mg/L		03/26/19 11:50	04/05/19 17:18	1
Chromium	ND		0.0010		mg/L		03/26/19 11:50	04/05/19 17:18	1
Cobalt	**0.0058**		0.00050		mg/L		03/26/19 11:50	04/05/19 17:18	1
Lead	ND		0.00050		mg/L		03/26/19 11:50	04/05/19 17:18	1
Molybdenum	**0.036**		0.00050		mg/L		03/26/19 11:50	04/05/19 17:18	1
Selenium	**0.0050**		0.00050		mg/L		03/26/19 11:50	04/05/19 17:18	1
Thallium	**0.00086**		0.00010		mg/L		03/26/19 11:50	04/05/19 17:18	1

Client Sample ID: FC-CCR-MW67-031719

Lab Sample ID: 550-119833-2

Date Collected: 03/17/19 15:05
Matrix: Water
Date Received: 03/21/19 14:48

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/03/19 16:26	04/04/19 10:59	1

Client Sample ID: FC-CCR-MW68-031719

Lab Sample ID: 550-119833-3

Date Collected: 03/17/19 12:52
Matrix: Water
Date Received: 03/21/19 14:48

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**9.2**	**D1**	2.0		mg/L			04/02/19 04:52	5

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 19:13	03/31/19 05:00	1
Lithium	**0.37**		0.20		mg/L		03/26/19 19:13	03/31/19 05:00	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:50	04/05/19 17:25	1
Arsenic	**0.0035**		0.00050		mg/L		03/26/19 11:50	04/05/19 17:25	1
Barium	**0.0084**		0.00050		mg/L		04/05/19 07:49	04/05/19 23:01	1
Cadmium	**0.00014**		0.00010		mg/L		03/26/19 11:50	04/05/19 17:25	1
Chromium	ND		0.0010		mg/L		04/05/19 07:49	04/09/19 22:14	1
Cobalt	**0.0026**		0.00050		mg/L		04/05/19 07:49	04/09/19 22:14	1
Lead	ND		0.00050		mg/L		03/26/19 11:50	04/05/19 17:25	1
Molybdenum	**0.0067**		0.00050		mg/L		04/05/19 07:49	04/05/19 23:01	1
Selenium	**0.14**		0.00050		mg/L		03/26/19 11:50	04/05/19 17:25	1
Thallium	**0.0010**		0.00010		mg/L		03/26/19 11:50	04/05/19 17:25	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/03/19 16:26	04/04/19 10:44	1

Client Sample ID: FC-CCR-MW69-031719

Lab Sample ID: 550-119833-4

Date Collected: 03/17/19 13:59
Matrix: Water
Date Received: 03/21/19 14:48

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**3.1**	**D1**	0.80		mg/L			04/02/19 05:10	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 19:13	03/31/19 05:06	1
Lithium	**0.27**		0.20		mg/L		03/26/19 19:13	03/31/19 05:06	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:50	04/05/19 17:27	1
Arsenic	**0.0032**		0.00050		mg/L		03/26/19 11:50	04/05/19 17:27	1
Barium	**0.010**		0.00050		mg/L		04/05/19 07:49	04/05/19 23:03	1
Cadmium	**0.00021**		0.00010		mg/L		03/26/19 11:50	04/05/19 17:27	1
Chromium	ND		0.0010		mg/L		04/05/19 07:49	04/09/19 03:36	1

Client Sample ID: FC-CCR-MW69-031719

Lab Sample ID: 550-119833-4
Date Collected: 03/17/19 13:59
Matrix: Water
Date Received: 03/21/19 14:48

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	**0.0031**		0.00050		mg/L		04/05/19 07:49	04/09/19 03:36	1
Lead	ND		0.00050		mg/L		03/26/19 11:50	04/05/19 17:27	1
Molybdenum	**0.011**		0.00050		mg/L		04/05/19 07:49	04/05/19 23:03	1
Selenium	**0.038**		0.00050		mg/L		03/26/19 11:50	04/05/19 17:27	1
Thallium	**0.00020**		0.00010		mg/L		03/26/19 11:50	04/05/19 17:27	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/03/19 16:26	04/04/19 11:05	1

Client Sample ID: FC-CCR-MW70-031819

Lab Sample ID: 550-119833-5
Date Collected: 03/18/19 16:04
Matrix: Water
Date Received: 03/21/19 14:48

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**2.3**	**D1**	0.80		mg/L			04/02/19 05:29	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 19:13	03/31/19 05:12	1
Lithium	**0.32**		0.20		mg/L		03/26/19 19:13	03/31/19 05:12	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:50	04/05/19 17:29	1
Arsenic	**0.0054**		0.00050		mg/L		03/26/19 11:50	04/05/19 17:29	1
Barium	**0.0099**		0.00050		mg/L		04/05/19 07:49	04/05/19 23:05	1
Cadmium	ND		0.00010		mg/L		03/26/19 11:50	04/05/19 17:29	1
Chromium	ND		0.0010		mg/L		04/05/19 07:49	04/09/19 03:38	1
Cobalt	**0.0040**		0.00050		mg/L		04/05/19 07:49	04/09/19 03:38	1
Lead	ND		0.00050		mg/L		03/26/19 11:50	04/05/19 17:29	1
Molybdenum	**0.0057**		0.00050		mg/L		04/05/19 07:49	04/05/19 23:05	1
Selenium	**0.24**		0.00050		mg/L		03/26/19 11:50	04/05/19 17:29	1
Thallium	**0.00029**		0.00010		mg/L		03/26/19 11:50	04/05/19 17:29	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/03/19 16:26	04/04/19 11:07	1

Client Sample ID: FC-CCR-MW71-031819

Lab Sample ID: 550-119833-6
Date Collected: 03/18/19 11:09
Matrix: Water
Date Received: 03/21/19 14:48

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			04/03/19 06:09	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 19:13	03/31/19 05:18	1
Lithium	**0.32**		0.20		mg/L		03/26/19 19:13	03/31/19 05:18	1

Client Sample ID: FC-CCR-MW71-031819

Lab Sample ID: 550-119833-6

Date Collected: 03/18/19 11:09
Matrix: Water
Date Received: 03/21/19 14:48

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:50	04/05/19 17:31	1
Arsenic	**0.0069**		0.00050		mg/L		03/26/19 11:50	04/05/19 17:31	1
Barium	**0.010**		0.00050		mg/L		04/05/19 07:49	04/05/19 23:07	1
Cadmium	ND		0.00010		mg/L		03/26/19 11:50	04/05/19 17:31	1
Chromium	ND		0.0010		mg/L		04/05/19 07:49	04/09/19 03:40	1
Cobalt	ND		0.00050		mg/L		04/05/19 07:49	04/09/19 03:40	1
Lead	ND		0.00050		mg/L		03/26/19 11:50	04/05/19 17:31	1
Molybdenum	**0.00066**		0.00050		mg/L		04/05/19 07:49	04/05/19 23:07	1
Selenium	**0.37**		0.00050		mg/L		03/26/19 11:50	04/05/19 17:31	1
Thallium	**0.00031**		0.00010		mg/L		03/26/19 11:50	04/05/19 17:31	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/03/19 16:26	04/04/19 11:08	1

Client Sample ID: FC-CCR-MW72-031719

Lab Sample ID: 550-119833-7

Date Collected: 03/17/19 10:50
Matrix: Water
Date Received: 03/21/19 14:48

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			04/02/19 06:42	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 19:13	03/31/19 05:24	1
Lithium	**0.36**		0.20		mg/L		03/26/19 19:13	03/31/19 05:24	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:50	04/05/19 17:33	1
Arsenic	**0.0034**		0.00050		mg/L		04/05/19 07:49	04/09/19 03:42	1
Barium	**0.0077**		0.00050		mg/L		04/05/19 07:49	04/05/19 23:09	1
Cadmium	ND		0.00010		mg/L		03/26/19 11:50	04/05/19 17:33	1
Chromium	ND		0.0010		mg/L		04/05/19 07:49	04/09/19 03:42	1
Cobalt	**0.0022**		0.00050		mg/L		04/05/19 07:49	04/09/19 03:42	1
Lead	ND		0.00050		mg/L		03/26/19 11:50	04/05/19 17:33	1
Molybdenum	**0.00095**		0.00050		mg/L		04/05/19 07:49	04/05/19 23:09	1
Selenium	**0.13**		0.00050		mg/L		04/05/19 07:49	04/09/19 03:42	1
Thallium	**0.00095**		0.00010		mg/L		03/26/19 11:50	04/05/19 17:33	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/03/19 16:26	04/04/19 11:10	1

Client Sample ID: FC-CCR-MW73-031819

Lab Sample ID: 550-119833-8

Date Collected: 03/18/19 17:40

Matrix: Water

Date Received: 03/21/19 14:48

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			04/02/19 07:01	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 19:13	03/31/19 05:30	1
Lithium	**0.26**		0.20		mg/L		03/26/19 19:13	03/31/19 05:30	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		04/05/19 07:49	04/05/19 23:11	1
Arsenic	ND		0.00050		mg/L		04/05/19 07:49	04/09/19 03:44	1
Barium	**0.023**		0.00050		mg/L		04/05/19 07:49	04/05/19 23:11	1
Cadmium	**0.00013**		0.00010		mg/L		04/05/19 07:49	04/05/19 23:11	1
Chromium	ND		0.0010		mg/L		04/05/19 07:49	04/09/19 03:44	1
Cobalt	**0.0038**		0.00050		mg/L		04/05/19 07:49	04/09/19 03:44	1
Lead	ND		0.00050		mg/L		04/05/19 07:49	04/05/19 23:11	1
Molybdenum	**0.0017**		0.00050		mg/L		04/05/19 07:49	04/05/19 23:11	1
Selenium	**0.0069**		0.00050		mg/L		04/05/19 07:49	04/09/19 03:44	1
Thallium	**0.00025**		0.00010		mg/L		04/05/19 07:49	04/05/19 23:11	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/03/19 16:26	04/04/19 11:11	1

Client Sample ID: FC-CCR-MW83-031819

Lab Sample ID: 550-119833-9

Date Collected: 03/18/19 09:43

Matrix: Water

Date Received: 03/21/19 14:48

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**1.2**	**D1**	0.80		mg/L			04/02/19 07:19	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 19:13	03/31/19 05:36	1
Lithium	ND		0.20		mg/L		03/26/19 19:13	03/31/19 05:36	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:50	04/05/19 17:37	1
Arsenic	**0.0023**		0.00050		mg/L		04/05/19 07:49	04/09/19 03:46	1
Barium	**0.034**		0.00050		mg/L		04/05/19 07:49	04/05/19 23:14	1
Cadmium	ND		0.00010		mg/L		03/26/19 11:50	04/05/19 17:37	1
Chromium	ND		0.0010		mg/L		04/05/19 07:49	04/09/19 03:46	1
Cobalt	ND		0.00050		mg/L		04/05/19 07:49	04/09/19 03:46	1
Lead	ND		0.00050		mg/L		03/26/19 11:50	04/05/19 17:37	1
Molybdenum	**0.053**		0.00050		mg/L		04/05/19 07:49	04/05/19 23:14	1
Selenium	**0.0012**		0.00050		mg/L		04/05/19 07:49	04/09/19 03:46	1
Thallium	ND		0.00010		mg/L		03/26/19 11:50	04/05/19 17:37	1

Client Sample ID: FC-CCR-MW83-031819

Lab Sample ID: 550-119833-9

Date Collected: 03/18/19 09:43

Matrix: Water

Date Received: 03/21/19 14:48

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/03/19 16:26	04/04/19 11:13	1

Client Sample ID: FC-CCR-FD01-032019

Lab Sample ID: 550-119833-10

Date Collected: 03/20/19 17:53

Matrix: Water

Date Received: 03/21/19 14:48

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			04/02/19 07:38	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 19:13	03/31/19 05:39	1
Lithium	**0.25**		0.20		mg/L		03/26/19 19:13	03/31/19 05:39	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		04/05/19 07:49	04/05/19 23:16	1
Arsenic	**0.0041**		0.00050		mg/L		04/05/19 07:49	04/09/19 03:48	1
Barium	**0.017**		0.00050		mg/L		04/05/19 07:49	04/05/19 23:16	1
Cadmium	ND		0.00010		mg/L		04/05/19 07:49	04/05/19 23:16	1
Chromium	ND		0.0010		mg/L		04/05/19 07:49	04/09/19 03:48	1
Cobalt	ND		0.00050		mg/L		04/05/19 07:49	04/09/19 03:48	1
Lead	ND		0.00050		mg/L		03/26/19 11:59	04/05/19 17:39	1
Molybdenum	**0.0045**		0.00050		mg/L		04/05/19 07:49	04/05/19 23:16	1
Selenium	**0.16**		0.00050		mg/L		04/05/19 07:49	04/09/19 03:48	1
Thallium	**0.00023**		0.00010		mg/L		03/26/19 11:59	04/05/19 17:39	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/03/19 16:26	04/04/19 11:14	1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 550-173745/1030
Matrix: Water
Analysis Batch: 173745

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.40		mg/L			04/02/19 02:25	1

Lab Sample ID: LCS 550-173745/50
Matrix: Water
Analysis Batch: 173745

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride			4.00	4.04		mg/L		101	90 - 110		

Lab Sample ID: LCSD 550-173745/51
Matrix: Water
Analysis Batch: 173745

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride			4.00	4.04		mg/L		101	90 - 110	0	20

Lab Sample ID: 550-119833-1 MS
Matrix: Water
Analysis Batch: 173745

Client Sample ID: FC-CCR-MW66-031819
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride	23	D1	20.0	42.8	D1	mg/L		98	80 - 120		

Lab Sample ID: 550-119833-1 MSD
Matrix: Water
Analysis Batch: 173745

Client Sample ID: FC-CCR-MW66-031819
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	23	D1	20.0	43.7	D1	mg/L		103	80 - 120	2	20

Lab Sample ID: MB 550-173849/2
Matrix: Water
Analysis Batch: 173849

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.40		mg/L			04/02/19 17:22	1

Lab Sample ID: LCS 550-173849/5
Matrix: Water
Analysis Batch: 173849

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride			4.00	4.06		mg/L		101	90 - 110		

Lab Sample ID: LCSD 550-173849/6
Matrix: Water
Analysis Batch: 173849

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride			4.00	4.07		mg/L		102	90 - 110	0	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: 550-120288-A-1 MS
Matrix: Water
Analysis Batch: 173849

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride	3.5		4.00	7.64		mg/L		103	80 - 120		

Lab Sample ID: 550-120288-A-1 MSD
Matrix: Water
Analysis Batch: 173849

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	3.5		4.00	7.66		mg/L		103	80 - 120	0	20

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 550-173037/1-A
Matrix: Water
Analysis Batch: 173639

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 173037

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		03/26/19 19:13	03/31/19 03:35	1
Lithium	ND		0.20		mg/L		03/26/19 19:13	03/31/19 03:35	1

Lab Sample ID: LCS 550-173037/2-A
Matrix: Water
Analysis Batch: 173639

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 173037

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Beryllium			1.00	0.880		mg/L		88	85 - 115		
Lithium			1.00	0.864		mg/L		86	85 - 115		

Lab Sample ID: LCSD 550-173037/3-A
Matrix: Water
Analysis Batch: 173639

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 173037

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Beryllium			1.00	0.911		mg/L		91	85 - 115	3	20
Lithium			1.00	0.899		mg/L		90	85 - 115	4	20

Lab Sample ID: 550-119829-B-1-D MS
Matrix: Water
Analysis Batch: 173639

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 173037

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Beryllium	ND		1.00	0.879		mg/L		88	70 - 130		
Lithium	0.92		1.00	1.81		mg/L		89	70 - 130		

Lab Sample ID: 550-119829-B-1-E MSD
Matrix: Water
Analysis Batch: 173639

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 173037

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Beryllium	ND		1.00	0.883		mg/L		88	70 - 130	0	20
Lithium	0.92		1.00	1.84		mg/L		93	70 - 130	2	20

Method: 200.8 LL - Metals (ICP/MS)

Lab Sample ID: MB 550-172991/1-A
Matrix: Water
Analysis Batch: 174191

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 172991

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		03/26/19 11:50	04/05/19 16:56	1
Arsenic	ND		0.00050		mg/L		03/26/19 11:50	04/05/19 16:56	1
Cadmium	ND		0.00010		mg/L		03/26/19 11:50	04/05/19 16:56	1
Chromium	ND		0.0010		mg/L		03/26/19 11:50	04/05/19 16:56	1
Cobalt	ND		0.00050		mg/L		03/26/19 11:50	04/05/19 16:56	1
Lead	ND		0.00050		mg/L		03/26/19 11:50	04/05/19 16:56	1
Molybdenum	ND		0.00050		mg/L		03/26/19 11:50	04/05/19 16:56	1
Selenium	ND		0.00050		mg/L		03/26/19 11:50	04/05/19 16:56	1
Thallium	ND		0.00010		mg/L		03/26/19 11:50	04/05/19 16:56	1

Lab Sample ID: MB 550-172991/1-A
Matrix: Water
Analysis Batch: 175305

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 172991

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Barium	ND		0.00050		mg/L		03/26/19 11:50	04/18/19 02:46	1

Lab Sample ID: LCS 550-172991/2-A
Matrix: Water
Analysis Batch: 174191

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 172991

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Antimony			0.100	0.103		mg/L		103	85 - 115		
Arsenic			0.100	0.103		mg/L		103	85 - 115		
Cadmium			0.100	0.101		mg/L		101	85 - 115		
Chromium			0.100	0.101		mg/L		101	85 - 115		
Cobalt			0.100	0.101		mg/L		101	85 - 115		
Lead			0.100	0.0964		mg/L		96	85 - 115		
Molybdenum			0.100	0.101		mg/L		101	85 - 115		
Selenium			0.100	0.101		mg/L		101	85 - 115		
Thallium			0.100	0.101		mg/L		101	85 - 115		

Lab Sample ID: LCSD 550-172991/3-A
Matrix: Water
Analysis Batch: 174191

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 172991

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony			0.100	0.102		mg/L		102	85 - 115	0	20
Arsenic			0.100	0.102		mg/L		102	85 - 115	1	20
Cadmium			0.100	0.101		mg/L		101	85 - 115	0	20
Chromium			0.100	0.101		mg/L		101	85 - 115	0	20
Cobalt			0.100	0.101		mg/L		101	85 - 115	1	20
Lead			0.100	0.0966		mg/L		97	85 - 115	0	20
Molybdenum			0.100	0.101		mg/L		101	85 - 115	0	20
Selenium			0.100	0.102		mg/L		102	85 - 115	1	20
Thallium			0.100	0.101		mg/L		101	85 - 115	0	20

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Lab Sample ID: 550-119833-1 MS
Matrix: Water
Analysis Batch: 174191

Client Sample ID: FC-CCR-MW66-031819
Prep Type: Total/NA
Prep Batch: 172991

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	ND		0.100	0.0972		mg/L		97	70 - 130
Arsenic	0.0012		0.100	0.128		mg/L		127	70 - 130
Cadmium	0.00016		0.100	0.0863		mg/L		86	70 - 130
Chromium	0.0010		0.100	0.108		mg/L		107	70 - 130
Cobalt	0.017		0.100	0.109		mg/L		92	70 - 130
Lead	ND		0.100	0.0825		mg/L		82	70 - 130
Molybdenum	0.016		0.100	0.116		mg/L		100	70 - 130
Selenium	0.0024		0.100	0.185	M1	mg/L		182	70 - 130
Thallium	0.0011		0.100	0.0884		mg/L		87	70 - 130

Lab Sample ID: 550-119833-1 MS
Matrix: Water
Analysis Batch: 175305

Client Sample ID: FC-CCR-MW66-031819
Prep Type: Total/NA
Prep Batch: 172991

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Barium	0.019		0.100	0.0897		mg/L		71	70 - 130

Lab Sample ID: 550-119833-1 MSD
Matrix: Water
Analysis Batch: 174191

Client Sample ID: FC-CCR-MW66-031819
Prep Type: Total/NA
Prep Batch: 172991

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	ND		0.100	0.0999		mg/L		100	70 - 130	3	20
Arsenic	0.0012		0.100	0.130		mg/L		128	70 - 130	1	20
Cadmium	0.00016		0.100	0.0882		mg/L		88	70 - 130	2	20
Chromium	0.0010		0.100	0.107		mg/L		106	70 - 130	1	20
Cobalt	0.017		0.100	0.108		mg/L		91	70 - 130	1	20
Lead	ND		0.100	0.0839		mg/L		84	70 - 130	2	20
Molybdenum	0.016		0.100	0.119		mg/L		104	70 - 130	3	20
Selenium	0.0024		0.100	0.183	M1	mg/L		180	70 - 130	1	20
Thallium	0.0011		0.100	0.0897		mg/L		89	70 - 130	2	20

Lab Sample ID: 550-119833-1 MSD
Matrix: Water
Analysis Batch: 175305

Client Sample ID: FC-CCR-MW66-031819
Prep Type: Total/NA
Prep Batch: 172991

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Barium	0.019		0.100	0.0900		mg/L		71	70 - 130	0	20

Lab Sample ID: MB 550-174092/1-A
Matrix: Water
Analysis Batch: 174336

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 174092

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		04/05/19 07:49	04/05/19 22:26	1
Barium	ND		0.00050		mg/L		04/05/19 07:49	04/05/19 22:26	1
Cadmium	ND		0.00010		mg/L		04/05/19 07:49	04/05/19 22:26	1
Lead	ND		0.00050		mg/L		04/05/19 07:49	04/05/19 22:26	1
Molybdenum	ND		0.00050		mg/L		04/05/19 07:49	04/05/19 22:26	1

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 550-174092/1-A
Matrix: Water
Analysis Batch: 174336

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 174092

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Thallium	ND		0.00010		mg/L		04/05/19 07:49	04/05/19 22:26	1

Lab Sample ID: MB 550-174092/1-A
Matrix: Water
Analysis Batch: 174451

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 174092

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.00050		mg/L		04/05/19 07:49	04/09/19 03:11	1
Chromium	ND		0.0010		mg/L		04/05/19 07:49	04/09/19 03:11	1
Cobalt	ND		0.00050		mg/L		04/05/19 07:49	04/09/19 03:11	1
Selenium	ND		0.00050		mg/L		04/05/19 07:49	04/09/19 03:11	1

Lab Sample ID: MB 550-174092/1-A
Matrix: Water
Analysis Batch: 174470

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 174092

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		0.0010		mg/L		04/05/19 07:49	04/09/19 21:56	1
Cobalt	ND		0.00050		mg/L		04/05/19 07:49	04/09/19 21:56	1

Lab Sample ID: LCS 550-174092/2-A
Matrix: Water
Analysis Batch: 174336

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 174092

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.100	0.0990		mg/L		99	85 - 115
Barium	0.100	0.101		mg/L		101	85 - 115
Cadmium	0.100	0.100		mg/L		100	85 - 115
Lead	0.100	0.0968		mg/L		97	85 - 115
Molybdenum	0.100	0.102		mg/L		102	85 - 115
Thallium	0.100	0.0968		mg/L		97	85 - 115

Lab Sample ID: LCS 550-174092/2-A
Matrix: Water
Analysis Batch: 174451

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 174092

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	0.100	0.110		mg/L		110	85 - 115
Chromium	0.100	0.105		mg/L		105	85 - 115
Cobalt	0.100	0.105		mg/L		105	85 - 115
Selenium	0.100	0.103		mg/L		103	85 - 115

Lab Sample ID: LCS 550-174092/2-A
Matrix: Water
Analysis Batch: 174470

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 174092

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	0.100	0.100		mg/L		100	85 - 115
Cobalt	0.100	0.0991		mg/L		99	85 - 115

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Lab Sample ID: LCSD 550-174092/3-A
Matrix: Water
Analysis Batch: 174336

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 174092

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony			0.100	0.0983		mg/L		98	85 - 115	1	20
Barium			0.100	0.101		mg/L		101	85 - 115	0	20
Cadmium			0.100	0.0993		mg/L		99	85 - 115	1	20
Lead			0.100	0.0964		mg/L		96	85 - 115	0	20
Molybdenum			0.100	0.101		mg/L		101	85 - 115	0	20
Thallium			0.100	0.0969		mg/L		97	85 - 115	0	20

Lab Sample ID: LCSD 550-174092/3-A
Matrix: Water
Analysis Batch: 174451

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 174092

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic			0.100	0.111		mg/L		111	85 - 115	0	20
Chromium			0.100	0.104		mg/L		104	85 - 115	1	20
Cobalt			0.100	0.105		mg/L		105	85 - 115	0	20
Selenium			0.100	0.104		mg/L		104	85 - 115	1	20

Lab Sample ID: LCSD 550-174092/3-A
Matrix: Water
Analysis Batch: 174470

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 174092

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium			0.100	0.106		mg/L		106	85 - 115	5	20
Cobalt			0.100	0.105		mg/L		105	85 - 115	5	20

Lab Sample ID: 550-119867-E-1-E MS
Matrix: Water
Analysis Batch: 174336

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 174092

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	ND		0.100	0.103		mg/L		102	70 - 130
Barium	0.072		0.100	0.173		mg/L		102	70 - 130
Cadmium	0.00022		0.100	0.0988		mg/L		99	70 - 130
Lead	ND		0.100	0.0951		mg/L		95	70 - 130
Molybdenum	0.0017		0.100	0.108		mg/L		106	70 - 130
Thallium	ND		0.100	0.0948		mg/L		95	70 - 130

Lab Sample ID: 550-119867-E-1-E MS
Matrix: Water
Analysis Batch: 174451

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 174092

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	0.0036		0.100	0.120		mg/L		116	70 - 130
Chromium	ND		0.100	0.107		mg/L		107	70 - 130
Cobalt	ND		0.100	0.104		mg/L		104	70 - 130
Selenium	ND		0.100	0.109		mg/L		109	70 - 130

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Lab Sample ID: 550-119867-E-1-E MS
Matrix: Water
Analysis Batch: 174470

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 174092

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chromium	ND		0.100	0.101		mg/L		101	70 - 130		
Cobalt	ND		0.100	0.0981		mg/L		98	70 - 130		

Lab Sample ID: 550-119867-E-1-F MSD
Matrix: Water
Analysis Batch: 174336

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 174092

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	ND		0.100	0.101		mg/L		101	70 - 130	2	20
Barium	0.072		0.100	0.171		mg/L		99	70 - 130	2	20
Cadmium	0.00022		0.100	0.0982		mg/L		98	70 - 130	1	20
Lead	ND		0.100	0.0935		mg/L		93	70 - 130	2	20
Molybdenum	0.0017		0.100	0.106		mg/L		105	70 - 130	2	20
Thallium	ND		0.100	0.0942		mg/L		94	70 - 130	1	20

Lab Sample ID: 550-119867-E-1-F MSD
Matrix: Water
Analysis Batch: 174451

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 174092

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	0.0036		0.100	0.120		mg/L		116	70 - 130	0	20
Chromium	ND		0.100	0.108		mg/L		108	70 - 130	2	20
Cobalt	ND		0.100	0.106		mg/L		105	70 - 130	1	20
Selenium	ND		0.100	0.111		mg/L		111	70 - 130	2	20

Lab Sample ID: 550-119867-E-1-F MSD
Matrix: Water
Analysis Batch: 174470

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 174092

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium	ND		0.100	0.0997		mg/L		100	70 - 130	1	20
Cobalt	ND		0.100	0.0962		mg/L		96	70 - 130	2	20

Lab Sample ID: MB 550-175310/1-A
Matrix: Water
Analysis Batch: 175447

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 175310

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Barium	ND		0.00050		mg/L		04/18/19 07:36	04/18/19 21:10	1

Lab Sample ID: LCS 550-175310/4-A
Matrix: Water
Analysis Batch: 175447

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 175310

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Barium			0.100	0.105		mg/L		105	85 - 115		

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Lab Sample ID: LCSD 550-175310/5-A
Matrix: Water
Analysis Batch: 175447

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 175310

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Barium			0.100	0.107		mg/L		107	85 - 115	2	20

Lab Sample ID: 550-121243-D-1-A MS
Matrix: Water
Analysis Batch: 175447

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 175310

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Barium	0.10		0.100	0.206		mg/L		103	70 - 130

Lab Sample ID: 550-121243-D-1-B MSD
Matrix: Water
Analysis Batch: 175447

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 175310

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Barium	0.10		0.100	0.213		mg/L		111	70 - 130	4	20

Method: 245.1 - Mercury (CVAA)

Lab Sample ID: MB 550-173906/12-A
Matrix: Water
Analysis Batch: 174009

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 173906

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		04/03/19 16:26	04/04/19 10:36	1

Lab Sample ID: LCS 550-173906/13-A
Matrix: Water
Analysis Batch: 174009

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 173906

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Hg			0.00500	0.00513		mg/L		103	85 - 115

Lab Sample ID: LCSD 550-173906/14-A
Matrix: Water
Analysis Batch: 174009

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 173906

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Hg			0.00500	0.00495		mg/L		99	85 - 115	4	20

Lab Sample ID: 550-119833-3 MS
Matrix: Water
Analysis Batch: 174009

Client Sample ID: FC-CCR-MW68-031719
Prep Type: Total/NA
Prep Batch: 173906

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Hg	ND		0.00500	0.00393		mg/L		79	70 - 130

Method: 245.1 - Mercury (CVAA) (Continued)

Lab Sample ID: 550-119833-3 MSD
Matrix: Water
Analysis Batch: 174009

Client Sample ID: FC-CCR-MW68-031719
Prep Type: Total/NA
Prep Batch: 173906

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Hg	ND		0.00500	0.00434		mg/L		87	70 - 130	10	20

HPLC/IC

Analysis Batch: 173745

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119833-1	FC-CCR-MW66-031819	Total/NA	Water	300.0	
550-119833-2	FC-CCR-MW67-031719	Total/NA	Water	300.0	
550-119833-3	FC-CCR-MW68-031719	Total/NA	Water	300.0	
550-119833-4	FC-CCR-MW69-031719	Total/NA	Water	300.0	
550-119833-5	FC-CCR-MW70-031819	Total/NA	Water	300.0	
550-119833-7	FC-CCR-MW72-031719	Total/NA	Water	300.0	
550-119833-8	FC-CCR-MW73-031819	Total/NA	Water	300.0	
550-119833-9	FC-CCR-MW83-031819	Total/NA	Water	300.0	
550-119833-10	FC-CCR-FD01-032019	Total/NA	Water	300.0	
MB 550-173745/1030	Method Blank	Total/NA	Water	300.0	
LCS 550-173745/50	Lab Control Sample	Total/NA	Water	300.0	
LCSD 550-173745/51	Lab Control Sample Dup	Total/NA	Water	300.0	
550-119833-1 MS	FC-CCR-MW66-031819	Total/NA	Water	300.0	
550-119833-1 MSD	FC-CCR-MW66-031819	Total/NA	Water	300.0	

Analysis Batch: 173849

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119833-6	FC-CCR-MW71-031819	Total/NA	Water	300.0	
MB 550-173849/2	Method Blank	Total/NA	Water	300.0	
LCS 550-173849/5	Lab Control Sample	Total/NA	Water	300.0	
LCSD 550-173849/6	Lab Control Sample Dup	Total/NA	Water	300.0	
550-120288-A-1 MS	Matrix Spike	Total/NA	Water	300.0	
550-120288-A-1 MSD	Matrix Spike Duplicate	Total/NA	Water	300.0	

Metals

Prep Batch: 172991

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119833-1	FC-CCR-MW66-031819	Total/NA	Water	200.8	
550-119833-2	FC-CCR-MW67-031719	Total/NA	Water	200.8	
550-119833-3	FC-CCR-MW68-031719	Total/NA	Water	200.8	
550-119833-4	FC-CCR-MW69-031719	Total/NA	Water	200.8	
550-119833-5	FC-CCR-MW70-031819	Total/NA	Water	200.8	
550-119833-6	FC-CCR-MW71-031819	Total/NA	Water	200.8	
550-119833-7	FC-CCR-MW72-031719	Total/NA	Water	200.8	
550-119833-9	FC-CCR-MW83-031819	Total/NA	Water	200.8	
550-119833-10	FC-CCR-FD01-032019	Total/NA	Water	200.8	
MB 550-172991/1-A	Method Blank	Total/NA	Water	200.8	
LCS 550-172991/2-A	Lab Control Sample	Total/NA	Water	200.8	
LCSD 550-172991/3-A	Lab Control Sample Dup	Total/NA	Water	200.8	
550-119833-1 MS	FC-CCR-MW66-031819	Total/NA	Water	200.8	
550-119833-1 MSD	FC-CCR-MW66-031819	Total/NA	Water	200.8	

Prep Batch: 173037

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119833-1	FC-CCR-MW66-031819	Total/NA	Water	200.7	
550-119833-2	FC-CCR-MW67-031719	Total/NA	Water	200.7	
550-119833-3	FC-CCR-MW68-031719	Total/NA	Water	200.7	
550-119833-4	FC-CCR-MW69-031719	Total/NA	Water	200.7	
550-119833-5	FC-CCR-MW70-031819	Total/NA	Water	200.7	
550-119833-6	FC-CCR-MW71-031819	Total/NA	Water	200.7	

Metals (Continued)

Prep Batch: 173037 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119833-7	FC-CCR-MW72-031719	Total/NA	Water	200.7	
550-119833-8	FC-CCR-MW73-031819	Total/NA	Water	200.7	
550-119833-9	FC-CCR-MW83-031819	Total/NA	Water	200.7	
550-119833-10	FC-CCR-FD01-032019	Total/NA	Water	200.7	
MB 550-173037/1-A	Method Blank	Total/NA	Water	200.7	
LCS 550-173037/2-A	Lab Control Sample	Total/NA	Water	200.7	
LCSD 550-173037/3-A	Lab Control Sample Dup	Total/NA	Water	200.7	
550-119829-B-1-D MS	Matrix Spike	Total/NA	Water	200.7	
550-119829-B-1-E MSD	Matrix Spike Duplicate	Total/NA	Water	200.7	

Analysis Batch: 173639

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119833-1	FC-CCR-MW66-031819	Total/NA	Water	200.7 Rev 4.4	173037
550-119833-2	FC-CCR-MW67-031719	Total/NA	Water	200.7 Rev 4.4	173037
550-119833-3	FC-CCR-MW68-031719	Total/NA	Water	200.7 Rev 4.4	173037
550-119833-4	FC-CCR-MW69-031719	Total/NA	Water	200.7 Rev 4.4	173037
550-119833-5	FC-CCR-MW70-031819	Total/NA	Water	200.7 Rev 4.4	173037
550-119833-6	FC-CCR-MW71-031819	Total/NA	Water	200.7 Rev 4.4	173037
550-119833-7	FC-CCR-MW72-031719	Total/NA	Water	200.7 Rev 4.4	173037
550-119833-8	FC-CCR-MW73-031819	Total/NA	Water	200.7 Rev 4.4	173037
550-119833-9	FC-CCR-MW83-031819	Total/NA	Water	200.7 Rev 4.4	173037
550-119833-10	FC-CCR-FD01-032019	Total/NA	Water	200.7 Rev 4.4	173037
MB 550-173037/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	173037
LCS 550-173037/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	173037
LCSD 550-173037/3-A	Lab Control Sample Dup	Total/NA	Water	200.7 Rev 4.4	173037
550-119829-B-1-D MS	Matrix Spike	Total/NA	Water	200.7 Rev 4.4	173037
550-119829-B-1-E MSD	Matrix Spike Duplicate	Total/NA	Water	200.7 Rev 4.4	173037

Prep Batch: 173906

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119833-1	FC-CCR-MW66-031819	Total/NA	Water	245.1	
550-119833-2	FC-CCR-MW67-031719	Total/NA	Water	245.1	
550-119833-3	FC-CCR-MW68-031719	Total/NA	Water	245.1	
550-119833-4	FC-CCR-MW69-031719	Total/NA	Water	245.1	
550-119833-5	FC-CCR-MW70-031819	Total/NA	Water	245.1	
550-119833-6	FC-CCR-MW71-031819	Total/NA	Water	245.1	
550-119833-7	FC-CCR-MW72-031719	Total/NA	Water	245.1	
550-119833-8	FC-CCR-MW73-031819	Total/NA	Water	245.1	
550-119833-9	FC-CCR-MW83-031819	Total/NA	Water	245.1	
550-119833-10	FC-CCR-FD01-032019	Total/NA	Water	245.1	
MB 550-173906/12-A	Method Blank	Total/NA	Water	245.1	
LCS 550-173906/13-A	Lab Control Sample	Total/NA	Water	245.1	
LCSD 550-173906/14-A	Lab Control Sample Dup	Total/NA	Water	245.1	
550-119833-3 MS	FC-CCR-MW68-031719	Total/NA	Water	245.1	
550-119833-3 MSD	FC-CCR-MW68-031719	Total/NA	Water	245.1	

Analysis Batch: 174009

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119833-1	FC-CCR-MW66-031819	Total/NA	Water	245.1	173906
550-119833-2	FC-CCR-MW67-031719	Total/NA	Water	245.1	173906
550-119833-3	FC-CCR-MW68-031719	Total/NA	Water	245.1	173906

Metals (Continued)

Analysis Batch: 174009 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119833-4	FC-CCR-MW69-031719	Total/NA	Water	245.1	173906
550-119833-5	FC-CCR-MW70-031819	Total/NA	Water	245.1	173906
550-119833-6	FC-CCR-MW71-031819	Total/NA	Water	245.1	173906
550-119833-7	FC-CCR-MW72-031719	Total/NA	Water	245.1	173906
550-119833-8	FC-CCR-MW73-031819	Total/NA	Water	245.1	173906
550-119833-9	FC-CCR-MW83-031819	Total/NA	Water	245.1	173906
550-119833-10	FC-CCR-FD01-032019	Total/NA	Water	245.1	173906
MB 550-173906/12-A	Method Blank	Total/NA	Water	245.1	173906
LCS 550-173906/13-A	Lab Control Sample	Total/NA	Water	245.1	173906
LCSD 550-173906/14-A	Lab Control Sample Dup	Total/NA	Water	245.1	173906
550-119833-3 MS	FC-CCR-MW68-031719	Total/NA	Water	245.1	173906
550-119833-3 MSD	FC-CCR-MW68-031719	Total/NA	Water	245.1	173906

Prep Batch: 174092

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119833-2	FC-CCR-MW67-031719	Total/NA	Water	200.8	
550-119833-3	FC-CCR-MW68-031719	Total/NA	Water	200.8	
550-119833-4	FC-CCR-MW69-031719	Total/NA	Water	200.8	
550-119833-5	FC-CCR-MW70-031819	Total/NA	Water	200.8	
550-119833-6	FC-CCR-MW71-031819	Total/NA	Water	200.8	
550-119833-7	FC-CCR-MW72-031719	Total/NA	Water	200.8	
550-119833-8	FC-CCR-MW73-031819	Total/NA	Water	200.8	
550-119833-9	FC-CCR-MW83-031819	Total/NA	Water	200.8	
550-119833-10	FC-CCR-FD01-032019	Total/NA	Water	200.8	
MB 550-174092/1-A	Method Blank	Total/NA	Water	200.8	
LCS 550-174092/2-A	Lab Control Sample	Total/NA	Water	200.8	
LCSD 550-174092/3-A	Lab Control Sample Dup	Total/NA	Water	200.8	
550-119867-E-1-E MS	Matrix Spike	Total/NA	Water	200.8	
550-119867-E-1-F MSD	Matrix Spike Duplicate	Total/NA	Water	200.8	

Analysis Batch: 174191

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119833-1	FC-CCR-MW66-031819	Total/NA	Water	200.8 LL	172991
550-119833-2	FC-CCR-MW67-031719	Total/NA	Water	200.8 LL	172991
550-119833-3	FC-CCR-MW68-031719	Total/NA	Water	200.8 LL	172991
550-119833-4	FC-CCR-MW69-031719	Total/NA	Water	200.8 LL	172991
550-119833-5	FC-CCR-MW70-031819	Total/NA	Water	200.8 LL	172991
550-119833-6	FC-CCR-MW71-031819	Total/NA	Water	200.8 LL	172991
550-119833-7	FC-CCR-MW72-031719	Total/NA	Water	200.8 LL	172991
550-119833-9	FC-CCR-MW83-031819	Total/NA	Water	200.8 LL	172991
550-119833-10	FC-CCR-FD01-032019	Total/NA	Water	200.8 LL	172991
MB 550-172991/1-A	Method Blank	Total/NA	Water	200.8 LL	172991
LCS 550-172991/2-A	Lab Control Sample	Total/NA	Water	200.8 LL	172991
LCSD 550-172991/3-A	Lab Control Sample Dup	Total/NA	Water	200.8 LL	172991
550-119833-1 MS	FC-CCR-MW66-031819	Total/NA	Water	200.8 LL	172991
550-119833-1 MSD	FC-CCR-MW66-031819	Total/NA	Water	200.8 LL	172991

Analysis Batch: 174336

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119833-2	FC-CCR-MW67-031719	Total/NA	Water	200.8 LL	174092
550-119833-3	FC-CCR-MW68-031719	Total/NA	Water	200.8 LL	174092

Metals (Continued)

Analysis Batch: 174336 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119833-4	FC-CCR-MW69-031719	Total/NA	Water	200.8 LL	174092
550-119833-5	FC-CCR-MW70-031819	Total/NA	Water	200.8 LL	174092
550-119833-6	FC-CCR-MW71-031819	Total/NA	Water	200.8 LL	174092
550-119833-7	FC-CCR-MW72-031719	Total/NA	Water	200.8 LL	174092
550-119833-8	FC-CCR-MW73-031819	Total/NA	Water	200.8 LL	174092
550-119833-9	FC-CCR-MW83-031819	Total/NA	Water	200.8 LL	174092
550-119833-10	FC-CCR-FD01-032019	Total/NA	Water	200.8 LL	174092
MB 550-174092/1-A	Method Blank	Total/NA	Water	200.8 LL	174092
LCS 550-174092/2-A	Lab Control Sample	Total/NA	Water	200.8 LL	174092
LCSD 550-174092/3-A	Lab Control Sample Dup	Total/NA	Water	200.8 LL	174092
550-119867-E-1-E MS	Matrix Spike	Total/NA	Water	200.8 LL	174092
550-119867-E-1-F MSD	Matrix Spike Duplicate	Total/NA	Water	200.8 LL	174092

Analysis Batch: 174451

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119833-4	FC-CCR-MW69-031719	Total/NA	Water	200.8 LL	174092
550-119833-5	FC-CCR-MW70-031819	Total/NA	Water	200.8 LL	174092
550-119833-6	FC-CCR-MW71-031819	Total/NA	Water	200.8 LL	174092
550-119833-7	FC-CCR-MW72-031719	Total/NA	Water	200.8 LL	174092
550-119833-8	FC-CCR-MW73-031819	Total/NA	Water	200.8 LL	174092
550-119833-9	FC-CCR-MW83-031819	Total/NA	Water	200.8 LL	174092
550-119833-10	FC-CCR-FD01-032019	Total/NA	Water	200.8 LL	174092
MB 550-174092/1-A	Method Blank	Total/NA	Water	200.8 LL	174092
LCS 550-174092/2-A	Lab Control Sample	Total/NA	Water	200.8 LL	174092
LCSD 550-174092/3-A	Lab Control Sample Dup	Total/NA	Water	200.8 LL	174092
550-119867-E-1-E MS	Matrix Spike	Total/NA	Water	200.8 LL	174092
550-119867-E-1-F MSD	Matrix Spike Duplicate	Total/NA	Water	200.8 LL	174092

Analysis Batch: 174470

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119833-3	FC-CCR-MW68-031719	Total/NA	Water	200.8 LL	174092
MB 550-174092/1-A	Method Blank	Total/NA	Water	200.8 LL	174092
LCS 550-174092/2-A	Lab Control Sample	Total/NA	Water	200.8 LL	174092
LCSD 550-174092/3-A	Lab Control Sample Dup	Total/NA	Water	200.8 LL	174092
550-119867-E-1-E MS	Matrix Spike	Total/NA	Water	200.8 LL	174092
550-119867-E-1-F MSD	Matrix Spike Duplicate	Total/NA	Water	200.8 LL	174092

Analysis Batch: 175305

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 550-172991/1-A	Method Blank	Total/NA	Water	200.8 LL	172991
550-119833-1 MS	FC-CCR-MW66-031819	Total/NA	Water	200.8 LL	172991
550-119833-1 MSD	FC-CCR-MW66-031819	Total/NA	Water	200.8 LL	172991

Prep Batch: 175310

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119833-1	FC-CCR-MW66-031819	Total/NA	Water	200.8	
MB 550-175310/1-A	Method Blank	Total/NA	Water	200.8	
LCS 550-175310/4-A	Lab Control Sample	Total/NA	Water	200.8	
LCSD 550-175310/5-A	Lab Control Sample Dup	Total/NA	Water	200.8	
550-121243-D-1-A MS	Matrix Spike	Total/NA	Water	200.8	
550-121243-D-1-B MSD	Matrix Spike Duplicate	Total/NA	Water	200.8	

QC Association Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119833-1

Metals

Analysis Batch: 175447

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-119833-1	FC-CCR-MW66-031819	Total/NA	Water	200.8 LL	175310
MB 550-175310/1-A	Method Blank	Total/NA	Water	200.8 LL	175310
LCS 550-175310/4-A	Lab Control Sample	Total/NA	Water	200.8 LL	175310
LCSD 550-175310/5-A	Lab Control Sample Dup	Total/NA	Water	200.8 LL	175310
550-121243-D-1-A MS	Matrix Spike	Total/NA	Water	200.8 LL	175310
550-121243-D-1-B MSD	Matrix Spike Duplicate	Total/NA	Water	200.8 LL	175310

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119833-1

Client Sample ID: FC-CCR-MW66-031819

Lab Sample ID: 550-119833-1

Date Collected: 03/18/19 14:14

Matrix: Water

Date Received: 03/21/19 14:48

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		5	173745	04/02/19 03:38	NEL	TAL PHX
Total/NA	Prep	200.7			173037	03/26/19 19:13	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173639	03/31/19 04:43	SRA	TAL PHX
Total/NA	Prep	200.8			172991	03/26/19 11:50	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174191	04/05/19 17:12	ARE	TAL PHX
Total/NA	Prep	200.8			175310	04/18/19 07:36	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	175447	04/18/19 21:52	ARE	TAL PHX
Total/NA	Prep	245.1			173906	04/03/19 16:26	JTG	TAL PHX
Total/NA	Analysis	245.1		1	174009	04/04/19 10:57	JTG	TAL PHX

Client Sample ID: FC-CCR-MW67-031719

Lab Sample ID: 550-119833-2

Date Collected: 03/17/19 15:05

Matrix: Water

Date Received: 03/21/19 14:48

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		5	173745	04/02/19 04:34	NEL	TAL PHX
Total/NA	Prep	200.7			173037	03/26/19 19:13	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173639	03/31/19 04:54	SRA	TAL PHX
Total/NA	Prep	200.8			172991	03/26/19 11:50	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174191	04/05/19 17:18	ARE	TAL PHX
Total/NA	Prep	200.8			174092	04/05/19 07:49	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174336	04/05/19 22:59	ARE	TAL PHX
Total/NA	Prep	245.1			173906	04/03/19 16:26	JTG	TAL PHX
Total/NA	Analysis	245.1		1	174009	04/04/19 10:59	JTG	TAL PHX

Client Sample ID: FC-CCR-MW68-031719

Lab Sample ID: 550-119833-3

Date Collected: 03/17/19 12:52

Matrix: Water

Date Received: 03/21/19 14:48

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		5	173745	04/02/19 04:52	NEL	TAL PHX
Total/NA	Prep	200.7			173037	03/26/19 19:13	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173639	03/31/19 05:00	SRA	TAL PHX
Total/NA	Prep	200.8			172991	03/26/19 11:50	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174191	04/05/19 17:25	ARE	TAL PHX
Total/NA	Prep	200.8			174092	04/05/19 07:49	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174336	04/05/19 23:01	ARE	TAL PHX
Total/NA	Prep	200.8			174092	04/05/19 07:49	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174470	04/09/19 22:14	ARE	TAL PHX
Total/NA	Prep	245.1			173906	04/03/19 16:26	JTG	TAL PHX
Total/NA	Analysis	245.1		1	174009	04/04/19 10:44	JTG	TAL PHX

Client Sample ID: FC-CCR-MW69-031719

Lab Sample ID: 550-119833-4

Date Collected: 03/17/19 13:59

Matrix: Water

Date Received: 03/21/19 14:48

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	173745	04/02/19 05:10	NEL	TAL PHX
Total/NA	Prep	200.7			173037	03/26/19 19:13	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173639	03/31/19 05:06	SRA	TAL PHX
Total/NA	Prep	200.8			172991	03/26/19 11:50	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174191	04/05/19 17:27	ARE	TAL PHX
Total/NA	Prep	200.8			174092	04/05/19 07:49	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174336	04/05/19 23:03	ARE	TAL PHX
Total/NA	Prep	200.8			174092	04/05/19 07:49	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174451	04/09/19 03:36	ARE	TAL PHX
Total/NA	Prep	245.1			173906	04/03/19 16:26	JTG	TAL PHX
Total/NA	Analysis	245.1		1	174009	04/04/19 11:05	JTG	TAL PHX

Client Sample ID: FC-CCR-MW70-031819

Lab Sample ID: 550-119833-5

Date Collected: 03/18/19 16:04

Matrix: Water

Date Received: 03/21/19 14:48

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	173745	04/02/19 05:29	NEL	TAL PHX
Total/NA	Prep	200.7			173037	03/26/19 19:13	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173639	03/31/19 05:12	SRA	TAL PHX
Total/NA	Prep	200.8			172991	03/26/19 11:50	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174191	04/05/19 17:29	ARE	TAL PHX
Total/NA	Prep	200.8			174092	04/05/19 07:49	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174336	04/05/19 23:05	ARE	TAL PHX
Total/NA	Prep	200.8			174092	04/05/19 07:49	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174451	04/09/19 03:38	ARE	TAL PHX
Total/NA	Prep	245.1			173906	04/03/19 16:26	JTG	TAL PHX
Total/NA	Analysis	245.1		1	174009	04/04/19 11:07	JTG	TAL PHX

Client Sample ID: FC-CCR-MW71-031819

Lab Sample ID: 550-119833-6

Date Collected: 03/18/19 11:09

Matrix: Water

Date Received: 03/21/19 14:48

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	173849	04/03/19 06:09	NEL	TAL PHX
Total/NA	Prep	200.7			173037	03/26/19 19:13	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173639	03/31/19 05:18	SRA	TAL PHX
Total/NA	Prep	200.8			172991	03/26/19 11:50	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174191	04/05/19 17:31	ARE	TAL PHX
Total/NA	Prep	200.8			174092	04/05/19 07:49	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174336	04/05/19 23:07	ARE	TAL PHX
Total/NA	Prep	200.8			174092	04/05/19 07:49	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174451	04/09/19 03:40	ARE	TAL PHX
Total/NA	Prep	245.1			173906	04/03/19 16:26	JTG	TAL PHX
Total/NA	Analysis	245.1		1	174009	04/04/19 11:08	JTG	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119833-1

Client Sample ID: FC-CCR-MW72-031719

Lab Sample ID: 550-119833-7

Date Collected: 03/17/19 10:50

Matrix: Water

Date Received: 03/21/19 14:48

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	173745	04/02/19 06:42	NEL	TAL PHX
Total/NA	Prep	200.7			173037	03/26/19 19:13	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173639	03/31/19 05:24	SRA	TAL PHX
Total/NA	Prep	200.8			172991	03/26/19 11:50	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174191	04/05/19 17:33	ARE	TAL PHX
Total/NA	Prep	200.8			174092	04/05/19 07:49	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174336	04/05/19 23:09	ARE	TAL PHX
Total/NA	Prep	200.8			174092	04/05/19 07:49	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174451	04/09/19 03:42	ARE	TAL PHX
Total/NA	Prep	245.1			173906	04/03/19 16:26	JTG	TAL PHX
Total/NA	Analysis	245.1		1	174009	04/04/19 11:10	JTG	TAL PHX

Client Sample ID: FC-CCR-MW73-031819

Lab Sample ID: 550-119833-8

Date Collected: 03/18/19 17:40

Matrix: Water

Date Received: 03/21/19 14:48

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	173745	04/02/19 07:01	NEL	TAL PHX
Total/NA	Prep	200.7			173037	03/26/19 19:13	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173639	03/31/19 05:30	SRA	TAL PHX
Total/NA	Prep	200.8			174092	04/05/19 07:49	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174336	04/05/19 23:11	ARE	TAL PHX
Total/NA	Prep	200.8			174092	04/05/19 07:49	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174451	04/09/19 03:44	ARE	TAL PHX
Total/NA	Prep	245.1			173906	04/03/19 16:26	JTG	TAL PHX
Total/NA	Analysis	245.1		1	174009	04/04/19 11:11	JTG	TAL PHX

Client Sample ID: FC-CCR-MW83-031819

Lab Sample ID: 550-119833-9

Date Collected: 03/18/19 09:43

Matrix: Water

Date Received: 03/21/19 14:48

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	173745	04/02/19 07:19	NEL	TAL PHX
Total/NA	Prep	200.7			173037	03/26/19 19:13	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173639	03/31/19 05:36	SRA	TAL PHX
Total/NA	Prep	200.8			172991	03/26/19 11:50	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174191	04/05/19 17:37	ARE	TAL PHX
Total/NA	Prep	200.8			174092	04/05/19 07:49	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174336	04/05/19 23:14	ARE	TAL PHX
Total/NA	Prep	200.8			174092	04/05/19 07:49	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174451	04/09/19 03:46	ARE	TAL PHX
Total/NA	Prep	245.1			173906	04/03/19 16:26	JTG	TAL PHX
Total/NA	Analysis	245.1		1	174009	04/04/19 11:13	JTG	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119833-1

Client Sample ID: FC-CCR-FD01-032019

Date Collected: 03/20/19 17:53
Date Received: 03/21/19 14:48

Lab Sample ID: 550-119833-10

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	173745	04/02/19 07:38	NEL	TAL PHX
Total/NA	Prep	200.7			173037	03/26/19 19:13	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	173639	03/31/19 05:39	SRA	TAL PHX
Total/NA	Prep	200.8			172991	03/26/19 11:59	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174191	04/05/19 17:39	ARE	TAL PHX
Total/NA	Prep	200.8			174092	04/05/19 07:49	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174336	04/05/19 23:16	ARE	TAL PHX
Total/NA	Prep	200.8			174092	04/05/19 07:49	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	174451	04/09/19 03:48	ARE	TAL PHX
Total/NA	Prep	245.1			173906	04/03/19 16:26	JTG	TAL PHX
Total/NA	Analysis	245.1		1	174009	04/04/19 11:14	JTG	TAL PHX

Laboratory References:

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

Accreditation/Certification Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119833-1

Laboratory: Eurofins TestAmerica, Phoenix

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Arizona	State Program	9	AZ0728	06-09-19

Method Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-119833-1

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL PHX
200.7 Rev 4.4	Metals (ICP)	40CFR136A	TAL PHX
200.8 LL	Metals (ICP/MS)	EPA	TAL PHX
245.1	Mercury (CVAA)	EPA	TAL PHX
200.7	Preparation, Total Metals	EPA	TAL PHX
200.8	Preparation, Total Metals	EPA	TAL PHX
245.1	Preparation, Mercury	EPA	TAL PHX

Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.
EPA = US Environmental Protection Agency
MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

Laboratory References:

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

TestAmerica Phoenix
4645 E Cotton Ctr Blvd Bdg 3
Phoenix, AZ 85040

phone 602.437.3340 fax 623.445.6192

119833

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Doug Lavarnway	Site Contact: Doug Lavarnway	Date: 03/21/19	COC No:
APS Four Corners	Tel/Fax: 928-587-0319	Lab Contact: Ken Baker	Carrier:	1 of 1 COCs
PO Box 355, MS 4915	Analysis Turnaround Time			Job No. 1420192014.****.2
Fruitland, NM 87416	Calendar (C) or Work Days (W)			
Phone:	TAT if different from Below 7 Days			SDG No.
Fax:	☐ 2 weeks			
Project Name: CCR	☐ 1 week			
E-Mail Address:	☐ 2 days			
	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	Perform MS / MSD (Y / N)	EPA 200.7 (Be, Li)	200.8 (Sb, As, Ba, Cd, Cr, Co, Pb, Mo, Se, Tl)	Radium 226 + 228 combined	EPA 245.1 (Hg)	EPA 300.0 (F)	Sample Specific Notes:
FC-CCR-MW66-031819 -01	03/18/19	14:14	G	W	2	N	N	X	X	X	X	X	
FC-CCR-MW67-031719 -02	03/17/19	15:05	G	W	2	N	N	X	X	X	X	X	
FC-CCR-MW68-031719 -03	03/17/19	12:52	G	W	2	N	N	X	X	X	X	X	
FC-CCR-MW69-031719 -04	03/17/19	13:59	G	W	2	N	N	X	X	X	X	X	
FC-CCR-MW70-031819 -05	03/18/19	16:04	G	W	2	N	N	X	X	X	X	X	
FC-CCR-MW71-031819 -06	03/18/19	11:09	G	W	2	N	N	X	X	X	X	X	
FC-CCR-MW72-031719 -07	03/17/19	10:50	G	W	2	N	N	X	X	X	X	X	
FC-CCR-MW73-031819 -08	03/18/19	~~11:09~~ 17:40 IRT	G	W	2	N	N	X	X	X	X	X	
FC-CCR-MW83-031819 -09	03/18/19	09:43	G	W	2	N	N	X	X	X	X	X	
FC-CCR-FD01-032019 -10	03/20/19	17:53	G	W	2	N	N	X	X	X	X	X	

550-119833 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Special Instructions/QC Requirements & Comments:
Method 200.8 with collision cell
Radium to be analyzed by Radiation Safety

2.2/3.1

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Wood	3/21/19 14:48			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by: Lisa Maycock	Company: TAPhx-	Date/Time: 3/21/19 1448

Login Sample Receipt Checklist

Client: Arizona Public Service Company

Job Number: 550-119833-1

Login Number: 119833
List Number: 1
Creator: Gravlin, Andrea

List Source: Eurofins TestAmerica, Phoenix

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

eurofins | Environment Testing TestAmerica



ANALYTICAL REPORT

Eurofins TestAmerica, Phoenix
4625 East Cotton Ctr Blvd
Suite 189
Phoenix, AZ 85040
Tel: (602)437-3340

Laboratory Job ID: 550-122531-1
Client Project/Site: APS - Four Corners CCR

For:
Arizona Public Service Company
4801 Cholla Lake Rd
Joseph City, Arizona 86032

Attn: Doug Lavarnway

Authorized for release by:
5/31/2019 12:52:47 PM

Ken Baker, Project Manager II
(602)659-7624
ken.baker@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

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

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

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Definitions/Glossary

Client: Arizona Public Service Company
Project/Site: APS - Four Corners CCR

Job ID: 550-122531-1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
D1	Sample required dilution due to matrix.
D2	Sample required dilution due to high concentration of analyte.
D5	Minimum Reporting Limit (MRL) adjusted due to sample dilution; analyte was non-detect in the sample.

Metals

Qualifier	Qualifier Description
B1	Target analyte detected in method blank at or above the method reporting limit.
B7	Target analyte detected in method blank at or above method reporting limit. Concentration found in the sample was 10 times above the concentration found in the blank.
D2	Sample required dilution due to high concentration of analyte.
M1	Matrix spike recovery was high, the associated blank spike recovery was acceptable.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated blank spike was acceptable.

General Chemistry

Qualifier	Qualifier Description
D2	Sample required dilution due to high concentration of analyte.
H5	This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.
N1	See case narrative.

Glossary

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

Job ID: 550-122531-1

Laboratory: Eurofins TestAmerica, Phoenix

Narrative

Job Narrative
550-122531-1

Comments
No additional comments.

Receipt
The samples were received on 5/9/2019 6:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.1º C.

HPLC/IC
Method(s) 300.0: The following samples were diluted for Fluoride by method EPA 300.0 due to the nature of the samples matrix: FC-CCR-MW71-5719 (550-122531-6), FC-CCR-MW72-5719 (550-122531-7), FC-CCR-MW73-5619 (550-122531-8), FC-CCR-MW84-5719 (550-122531-11), FC-CCR-MW85-5719 (550-122531-12) and FC-CCR-FD02-5719 (550-122531-14). This analyte was not detected in the diluted samples. As such, elevated reporting limits (RLs) have been provided and these data have been qualified with D1 and D5 flags.

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

Metals
Method(s) 200.8: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 550-177724.

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

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

Sample Summary

Client: Arizona Public Service Company
Project/Site: APS - Four Corners CCR

Job ID: 550-122531-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
550-122531-1	FC-CCR-MW66-5719	Water	05/07/19 10:39	05/09/19 06:45	
550-122531-2	FC-CCR-MW67-5719	Water	05/07/19 16:37	05/09/19 06:45	
550-122531-3	FC-CCR-MW68-5719	Water	05/07/19 14:46	05/09/19 06:45	
550-122531-4	FC-CCR-MW69-5719	Water	05/07/19 15:39	05/09/19 06:45	
550-122531-5	FC-CCR-MW70-5719	Water	05/07/19 13:09	05/09/19 06:45	
550-122531-6	FC-CCR-MW71-5719	Water	05/06/19 20:11	05/09/19 06:45	
550-122531-7	FC-CCR-MW72-5719	Water	05/07/19 14:03	05/09/19 06:45	
550-122531-8	FC-CCR-MW73-5619	Water	05/06/19 19:18	05/09/19 06:45	
550-122531-9	FC-CCR-MW83-5619	Water	05/06/19 18:19	05/09/19 06:45	
550-122531-10	FC-CCR-FD01-5619	Water	05/06/19 18:19	05/09/19 06:45	
550-122531-11	FC-CCR-MW84-5719	Water	05/07/19 16:11	05/09/19 06:45	
550-122531-12	FC-CCR-MW85-5719	Water	05/07/19 17:19	05/09/19 06:45	
550-122531-13	FC-CCR-MW86-5719	Water	05/07/19 09:54	05/09/19 06:45	
550-122531-14	FC-CCR-FD02-5719	Water	05/07/19 09:54	05/09/19 06:45	

Detection Summary

Client: Arizona Public Service Company
Project/Site: APS - Four Corners CCR

Job ID: 550-122531-1

Client Sample ID: FC-CCR-MW66-5719 — Lab Sample ID: 550-122531-1

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	23	D1	0.80		mg/L	2		300.0	Total/NA
Boron	140	D2	0.20		mg/L	4		200.7 Rev 4.4	Total/NA
Calcium	410		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.43		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0020		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.018	B7	0.00050		mg/L	1		200.8 LL	Total/NA
Cobalt	0.015		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.016		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0021	M1	0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.0012		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	19000	D2	200		mg/L	1		SM 2540C	Total/NA
pH	7.2	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.9	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW67-5719 — Lab Sample ID: 550-122531-2

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	15	D1	0.80		mg/L	2		300.0	Total/NA
Boron	140	D2	0.10		mg/L	2		200.7 Rev 4.4	Total/NA
Calcium	400		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.43		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0012		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.016	B7	0.00050		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0072		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.035		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0051		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00087		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	20000	D2 N1	200		mg/L	1		SM 2540C	Total/NA
pH	7.3	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	17.3	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW68-5719 — Lab Sample ID: 550-122531-3

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	5.6		0.40		mg/L	1		300.0	Total/NA
Boron	120	D2	0.10		mg/L	2		200.7 Rev 4.4	Total/NA
Calcium	410		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.51		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0043		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.0074	B7	0.00050		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0072		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0090		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.18		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.0014		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	17000	D2	200		mg/L	1		SM 2540C	Total/NA
pH	7.2	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.8	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW69-5719 — Lab Sample ID: 550-122531-4

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	7.9	D1	0.80		mg/L	2		300.0	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Phoenix

Client Sample ID: FC-CCR-MW69-5719 (Continued) — Lab Sample ID: 550-122531-4

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Boron	68		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	440		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.32		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0021		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.0096	B7	0.00050		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0035		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0099		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.029	M1	0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00033		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	11000	D2 N1	100		mg/L	1		SM 2540C	Total/NA
pH	7.3	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	19.1	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW70-5719 — Lab Sample ID: 550-122531-5

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	2.3	D1	0.80		mg/L	2		300.0	Total/NA
Boron	94		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	450		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.38		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0046		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.011	B7	0.00050		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0043		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0058		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.24		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00024		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	11000	D2 N1	100		mg/L	1		SM 2540C	Total/NA
pH	7.1	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	6.2	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW71-5719 — Lab Sample ID: 550-122531-6

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Boron	0.50		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	400	M3	2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.38		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0070		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.0097	B7	0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.00072		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.30		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00027		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	16000	D2	200		mg/L	1		SM 2540C	Total/NA
pH	7.5	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	6.1	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW72-5719 — Lab Sample ID: 550-122531-7

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Boron	0.22		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	400		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.42		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0028		0.00050		mg/L	1		200.8 LL	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-MW72-5719 (Continued) — Lab Sample ID: 550-122531-7

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Barium	0.0080	B7	0.00050		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0018		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.00077		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.16		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00091		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	16000	D2 N1	100		mg/L	1		SM 2540C	Total/NA
pH	7.2	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	6.9	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW73-5619 — Lab Sample ID: 550-122531-8

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Boron	1.6		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	420		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.37		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.00068		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.020	B7	0.00050		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0065		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0018		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0051		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00019		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	13000	D2 N1	100		mg/L	1		SM 2540C	Total/NA
pH	7.2	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	7.2	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW83-5619 — Lab Sample ID: 550-122531-9

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	1.0	D1	0.80		mg/L	2		300.0	Total/NA
Boron	1.8		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	240		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0017		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.032	B7	0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.037		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0014		0.00050		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	2300	N1	20		mg/L	1		SM 2540C	Total/NA
pH	7.5	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	7.4	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-FD01-5619 — Lab Sample ID: 550-122531-10

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	1.1	D1	0.80		mg/L	2		300.0	Total/NA
Boron	1.8		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	240		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.20		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0017		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.032	B7	0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.035		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0013		0.00050		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	2500	N1	20		mg/L	1		SM 2540C	Total/NA
pH	7.5	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-FD01-5619 (Continued) — Lab Sample ID: 550-122531-10

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Temperature	9.0	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW84-5719 — Lab Sample ID: 550-122531-11

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Boron	90	D2	0.10		mg/L	2		200.7 Rev 4.4	Total/NA
Calcium	430		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.23		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.00089		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.014	B7 D2	0.0010		mg/L	2		200.8 LL	Total/NA
Cobalt	0.0070		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.010		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0022		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00031		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	13000	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.2	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	8.8	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW85-5719 — Lab Sample ID: 550-122531-12

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Boron	41		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	450		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.31		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0059		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.016	B7 D2	0.0010		mg/L	2		200.8 LL	Total/NA
Molybdenum	0.0059		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.20		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00020		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	8600	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.3	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	9.7	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW86-5719 — Lab Sample ID: 550-122531-13

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	0.80	D1	0.80		mg/L	2		300.0	Total/NA
Boron	54		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	380		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.29		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.00096		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.014	B7 D2	0.0010		mg/L	2		200.8 LL	Total/NA
Cobalt	0.0018		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0036		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0091		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00025		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	8900	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.4	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	10.0	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Arizona Public Service Company
Project/Site: APS - Four Corners CCR

Job ID: 550-122531-1

Client Sample ID: FC-CCR-FD02-5719

Lab Sample ID: 550-122531-14

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Boron	54		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	380		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.29		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0013		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.013	B7 D2	0.0010		mg/L	2		200.8 LL	Total/NA
Cobalt	0.0018		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0036		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.010		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00025		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	9000	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.4	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	11.1	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-MW66-5719

Lab Sample ID: 550-122531-1
Date Collected: 05/07/19 10:39
Matrix: Water
Date Received: 05/09/19 06:45

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	23	D1	0.80		mg/L			05/14/19 22:35	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	140	D2	0.20		mg/L		05/14/19 06:18	05/15/19 19:40	4
Calcium	410		2.0		mg/L		05/14/19 06:18	05/15/19 00:37	1
Lithium	0.43		0.20		mg/L		05/14/19 06:18	05/15/19 00:37	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0020		0.00050		mg/L		05/12/19 16:22	05/21/19 01:39	1
Barium	0.018	B7	0.00050		mg/L		05/30/19 05:22	05/31/19 03:57	1
Cobalt	0.015		0.00050		mg/L		05/12/19 16:22	05/21/19 01:39	1
Molybdenum	0.016		0.00050		mg/L		05/12/19 16:22	05/21/19 01:39	1
Selenium	0.0021	M1	0.00050		mg/L		05/12/19 16:22	05/21/19 01:39	1
Thallium	0.0012		0.00010		mg/L		05/12/19 16:22	05/21/19 01:39	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	19000	D2	200		mg/L			05/13/19 10:08	1
pH	7.2	H5	1.7		SU			05/13/19 15:10	1
Temperature	18.9	H5	0.1		Degrees C			05/13/19 15:10	1

Client Sample ID: FC-CCR-MW67-5719

Lab Sample ID: 550-122531-2
Date Collected: 05/07/19 16:37
Matrix: Water
Date Received: 05/09/19 06:45

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	15	D1	0.80		mg/L			05/14/19 23:11	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	140	D2	0.10		mg/L		05/12/19 14:16	05/17/19 15:58	2
Calcium	400		2.0		mg/L		05/12/19 14:16	05/15/19 01:51	1
Lithium	0.43		0.20		mg/L		05/12/19 14:16	05/15/19 01:51	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0012		0.00050		mg/L		05/24/19 11:46	05/29/19 06:00	1
Barium	0.016	B7	0.00050		mg/L		05/30/19 05:22	05/31/19 03:59	1
Cobalt	0.0072		0.00050		mg/L		05/24/19 11:46	05/29/19 06:00	1
Molybdenum	0.035		0.00050		mg/L		05/24/19 11:46	05/29/19 06:00	1
Selenium	0.0051		0.00050		mg/L		05/24/19 11:46	05/29/19 06:00	1
Thallium	0.00087		0.00010		mg/L		05/24/19 11:46	05/29/19 06:00	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	20000	D2 N1	200		mg/L			05/10/19 10:48	1
pH	7.3	H5	1.7		SU			05/13/19 15:10	1
Temperature	17.3	H5	0.1		Degrees C			05/13/19 15:10	1

Client Sample ID: FC-CCR-MW68-5719

Lab Sample ID: 550-122531-3
Date Collected: 05/07/19 14:46
Matrix: Water
Date Received: 05/09/19 06:45

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	5.6		0.40		mg/L			05/14/19 23:48	1

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	120	D2	0.10		mg/L		05/12/19 14:16	05/17/19 16:04	2
Calcium	410		2.0		mg/L		05/12/19 14:16	05/15/19 01:57	1
Lithium	0.51		0.20		mg/L		05/12/19 14:16	05/15/19 01:57	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0043		0.00050		mg/L		05/24/19 11:46	05/29/19 06:02	1
Barium	0.0074	B7	0.00050		mg/L		05/30/19 05:22	05/31/19 04:01	1
Cobalt	0.0072		0.00050		mg/L		05/24/19 11:46	05/29/19 06:02	1
Molybdenum	0.0090		0.00050		mg/L		05/24/19 11:46	05/29/19 06:02	1
Selenium	0.18		0.00050		mg/L		05/24/19 11:46	05/29/19 06:02	1
Thallium	0.0014		0.00010		mg/L		05/24/19 11:46	05/29/19 06:02	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	17000	D2	200		mg/L			05/13/19 10:08	1
pH	7.2	H5	1.7		SU			05/13/19 15:10	1
Temperature	18.8	H5	0.1		Degrees C			05/13/19 15:10	1

Client Sample ID: FC-CCR-MW69-5719

Lab Sample ID: 550-122531-4
Date Collected: 05/07/19 15:39
Matrix: Water
Date Received: 05/09/19 06:45

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	7.9	D1	0.80		mg/L			05/15/19 01:02	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	68		0.050		mg/L		05/12/19 14:16	05/15/19 02:03	1
Calcium	440		2.0		mg/L		05/12/19 14:16	05/15/19 02:03	1
Lithium	0.32		0.20		mg/L		05/12/19 14:16	05/15/19 02:03	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0021		0.00050		mg/L		05/24/19 11:46	05/29/19 05:56	1
Barium	0.0096	B7	0.00050		mg/L		05/30/19 05:22	05/31/19 04:03	1
Cobalt	0.0035		0.00050		mg/L		05/24/19 11:46	05/29/19 05:56	1
Molybdenum	0.0099		0.00050		mg/L		05/24/19 11:46	05/29/19 05:56	1
Selenium	0.029	M1	0.00050		mg/L		05/24/19 11:46	05/29/19 05:56	1
Thallium	0.00033		0.00010		mg/L		05/24/19 11:46	05/29/19 05:56	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	11000	D2 N1	100		mg/L			05/10/19 10:48	1
pH	7.3	H5	1.7		SU			05/13/19 15:10	1
Temperature	19.1	H5	0.1		Degrees C			05/13/19 15:10	1

Client Sample ID: FC-CCR-MW70-5719

Lab Sample ID: 550-122531-5

Date Collected: 05/07/19 13:09

Matrix: Water

Date Received: 05/09/19 06:45

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	2.3	D1	0.80		mg/L			05/15/19 01:39	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	94		0.050		mg/L		05/12/19 14:16	05/15/19 02:09	1
Calcium	450		2.0		mg/L		05/12/19 14:16	05/15/19 02:09	1
Lithium	0.38		0.20		mg/L		05/12/19 14:16	05/15/19 02:09	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0046		0.00050		mg/L		05/24/19 11:46	05/29/19 06:04	1
Barium	0.011	B7	0.00050		mg/L		05/30/19 05:22	05/31/19 04:09	1
Cobalt	0.0043		0.00050		mg/L		05/24/19 11:46	05/29/19 06:04	1
Molybdenum	0.0058		0.00050		mg/L		05/24/19 11:46	05/29/19 06:04	1
Selenium	0.24		0.00050		mg/L		05/24/19 11:46	05/29/19 06:04	1
Thallium	0.00024		0.00010		mg/L		05/24/19 11:46	05/29/19 06:04	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	11000	D2 N1	100		mg/L			05/10/19 10:48	1
pH	7.1	H5	1.7		SU			05/14/19 15:45	1
Temperature	6.2	H5	0.1		Degrees C			05/14/19 15:45	1

Client Sample ID: FC-CCR-MW71-5719

Lab Sample ID: 550-122531-6

Date Collected: 05/06/19 20:11

Matrix: Water

Date Received: 05/09/19 06:45

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			05/15/19 02:15	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.50		0.050		mg/L		05/12/19 14:16	05/15/19 01:45	1
Calcium	400	M3	2.0		mg/L		05/12/19 14:16	05/15/19 01:45	1
Lithium	0.38		0.20		mg/L		05/12/19 14:16	05/15/19 01:45	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0070		0.00050		mg/L		05/12/19 16:22	05/21/19 01:41	1
Barium	0.0097	B7	0.00050		mg/L		05/30/19 05:22	05/31/19 04:12	1
Cobalt	ND		0.00050		mg/L		05/12/19 16:22	05/21/19 01:41	1
Molybdenum	0.00072		0.00050		mg/L		05/12/19 16:22	05/21/19 01:41	1
Selenium	0.30		0.00050		mg/L		05/12/19 16:22	05/21/19 01:41	1
Thallium	0.00027		0.00010		mg/L		05/12/19 16:22	05/21/19 01:41	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	16000	D2	200		mg/L			05/13/19 10:08	1
pH	7.5	H5	1.7		SU			05/14/19 15:45	1
Temperature	6.1	H5	0.1		Degrees C			05/14/19 15:45	1

Client Sample ID: FC-CCR-MW72-5719

Lab Sample ID: 550-122531-7

Date Collected: 05/07/19 14:03

Matrix: Water

Date Received: 05/09/19 06:45

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			05/15/19 04:43	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.22		0.050		mg/L		05/12/19 14:16	05/15/19 02:15	1
Calcium	400		2.0		mg/L		05/12/19 14:16	05/15/19 02:15	1
Lithium	0.42		0.20		mg/L		05/12/19 14:16	05/15/19 02:15	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0028		0.00050		mg/L		05/24/19 11:46	05/29/19 06:12	1
Barium	0.0080	B7	0.00050		mg/L		05/30/19 05:22	05/31/19 04:14	1
Cobalt	0.0018		0.00050		mg/L		05/24/19 11:46	05/29/19 06:12	1
Molybdenum	0.00077		0.00050		mg/L		05/24/19 11:46	05/29/19 06:12	1
Selenium	0.16		0.00050		mg/L		05/24/19 11:46	05/29/19 06:12	1
Thallium	0.00091		0.00010		mg/L		05/24/19 11:46	05/29/19 06:12	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	16000	D2 N1	100		mg/L			05/10/19 10:48	1
pH	7.2	H5	1.7		SU			05/14/19 15:45	1
Temperature	6.9	H5	0.1		Degrees C			05/14/19 15:45	1

Client Sample ID: FC-CCR-MW73-5619

Lab Sample ID: 550-122531-8

Date Collected: 05/06/19 19:18

Matrix: Water

Date Received: 05/09/19 06:45

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			05/15/19 05:19	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.6		0.050		mg/L		05/12/19 14:16	05/15/19 02:21	1
Calcium	420		2.0		mg/L		05/12/19 14:16	05/15/19 02:21	1
Lithium	0.37		0.20		mg/L		05/12/19 14:16	05/15/19 02:21	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00068		0.00050		mg/L		05/24/19 11:46	05/29/19 06:15	1
Barium	0.020	B7	0.00050		mg/L		05/30/19 05:22	05/31/19 04:16	1
Cobalt	0.0065		0.00050		mg/L		05/24/19 11:46	05/29/19 06:15	1
Molybdenum	0.0018		0.00050		mg/L		05/24/19 11:46	05/29/19 06:15	1
Selenium	0.0051		0.00050		mg/L		05/24/19 11:46	05/29/19 06:15	1
Thallium	0.00019		0.00010		mg/L		05/24/19 11:46	05/29/19 06:15	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	13000	D2 N1	100		mg/L			05/10/19 10:48	1
pH	7.2	H5	1.7		SU			05/14/19 15:45	1
Temperature	7.2	H5	0.1		Degrees C			05/14/19 15:45	1

Client Sample ID: FC-CCR-MW83-5619

Lab Sample ID: 550-122531-9

Date Collected: 05/06/19 18:19

Matrix: Water

Date Received: 05/09/19 06:45

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**1.0**	**D1**	0.80		mg/L			05/15/19 05:56	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	**1.8**		0.050		mg/L		05/12/19 14:16	05/15/19 02:27	1
Calcium	**240**		2.0		mg/L		05/12/19 14:16	05/15/19 02:27	1
Lithium	ND		0.20		mg/L		05/12/19 14:16	05/15/19 02:27	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.0017**		0.00050		mg/L		05/24/19 11:46	05/29/19 06:17	1
Barium	**0.032**	**B7**	0.00050		mg/L		05/30/19 05:22	05/31/19 04:18	1
Cobalt	ND		0.00050		mg/L		05/24/19 11:46	05/29/19 06:17	1
Molybdenum	**0.037**		0.00050		mg/L		05/24/19 11:46	05/29/19 06:17	1
Selenium	**0.0014**		0.00050		mg/L		05/24/19 11:46	05/29/19 06:17	1
Thallium	ND		0.00010		mg/L		05/24/19 11:46	05/29/19 06:17	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**2300**	**N1**	20		mg/L			05/10/19 10:48	1
pH	**7.5**	**H5**	1.7		SU			05/14/19 15:45	1
Temperature	**7.4**	**H5**	0.1		Degrees C			05/14/19 15:45	1

Client Sample ID: FC-CCR-FD01-5619

Lab Sample ID: 550-122531-10

Date Collected: 05/06/19 18:19

Matrix: Water

Date Received: 05/09/19 06:45

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**1.1**	**D1**	0.80		mg/L			05/15/19 06:33	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	**1.8**		0.050		mg/L		05/12/19 14:16	05/15/19 02:29	1
Calcium	**240**		2.0		mg/L		05/12/19 14:16	05/15/19 02:29	1
Lithium	**0.20**		0.20		mg/L		05/12/19 14:16	05/15/19 02:29	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.0017**		0.00050		mg/L		05/24/19 11:46	05/29/19 06:19	1
Barium	**0.032**	**B7**	0.00050		mg/L		05/30/19 05:22	05/31/19 04:20	1
Cobalt	ND		0.00050		mg/L		05/24/19 11:46	05/29/19 06:19	1
Molybdenum	**0.035**		0.00050		mg/L		05/24/19 11:46	05/29/19 06:19	1
Selenium	**0.0013**		0.00050		mg/L		05/24/19 11:46	05/29/19 06:19	1
Thallium	ND		0.00010		mg/L		05/24/19 11:46	05/29/19 06:19	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**2500**	**N1**	20		mg/L			05/10/19 10:48	1
pH	**7.5**	**H5**	1.7		SU			05/14/19 15:45	1
Temperature	**9.0**	**H5**	0.1		Degrees C			05/14/19 15:45	1

Client Sample ID: FC-CCR-MW84-5719

Lab Sample ID: 550-122531-11

Date Collected: 05/07/19 16:11

Matrix: Water

Date Received: 05/09/19 06:45

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			05/15/19 07:10	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	**90**	**D2**	0.10		mg/L		05/12/19 14:16	05/17/19 16:10	2
Calcium	**430**		2.0		mg/L		05/12/19 14:16	05/15/19 02:32	1
Lithium	**0.23**		0.20		mg/L		05/12/19 14:16	05/15/19 02:32	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.00089**		0.00050		mg/L		05/24/19 11:46	05/29/19 20:01	1
Barium	**0.014**	**B7 D2**	0.0010		mg/L		05/30/19 05:22	05/31/19 05:34	2
Cobalt	**0.0070**		0.00050		mg/L		05/24/19 11:46	05/29/19 20:01	1
Molybdenum	**0.010**		0.00050		mg/L		05/24/19 11:46	05/29/19 06:21	1
Selenium	**0.0022**		0.00050		mg/L		05/24/19 11:46	05/29/19 20:01	1
Thallium	**0.00031**		0.00010		mg/L		05/24/19 11:46	05/29/19 06:21	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**13000**	**D2**	100		mg/L			05/10/19 10:48	1
pH	**7.2**	**H5**	1.7		SU			05/14/19 15:45	1
Temperature	**8.8**	**H5**	0.1		Degrees C			05/14/19 15:45	1

Client Sample ID: FC-CCR-MW85-5719

Lab Sample ID: 550-122531-12

Date Collected: 05/07/19 17:19

Matrix: Water

Date Received: 05/09/19 06:45

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			05/15/19 08:23	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	**41**		0.050		mg/L		05/12/19 14:16	05/15/19 02:44	1
Calcium	**450**		2.0		mg/L		05/12/19 14:16	05/15/19 02:44	1
Lithium	**0.31**		0.20		mg/L		05/12/19 14:16	05/15/19 02:44	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.0059**		0.00050		mg/L		05/24/19 11:46	05/29/19 20:03	1
Barium	**0.016**	**B7 D2**	0.0010		mg/L		05/30/19 05:22	05/31/19 05:36	2
Cobalt	ND		0.00050		mg/L		05/24/19 11:46	05/29/19 20:03	1
Molybdenum	**0.0059**		0.00050		mg/L		05/24/19 11:46	05/29/19 06:23	1
Selenium	**0.20**		0.00050		mg/L		05/24/19 11:46	05/29/19 20:03	1
Thallium	**0.00020**		0.00010		mg/L		05/24/19 11:46	05/29/19 06:23	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**8600**	**D2**	100		mg/L			05/10/19 10:48	1
pH	**7.3**	**H5**	1.7		SU			05/14/19 15:45	1
Temperature	**9.7**	**H5**	0.1		Degrees C			05/14/19 15:45	1

Client Sample ID: FC-CCR-MW86-5719

Lab Sample ID: 550-122531-13

Date Collected: 05/07/19 09:54

Matrix: Water

Date Received: 05/09/19 06:45

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.80	D1	0.80		mg/L			05/15/19 09:00	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	54		0.050		mg/L		05/12/19 14:16	05/15/19 02:50	1
Calcium	380		2.0		mg/L		05/12/19 14:16	05/15/19 02:50	1
Lithium	0.29		0.20		mg/L		05/12/19 14:16	05/15/19 02:50	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00096		0.00050		mg/L		05/24/19 11:46	05/29/19 20:05	1
Barium	0.014	B7 D2	0.0010		mg/L		05/30/19 05:22	05/31/19 05:39	2
Cobalt	0.0018		0.00050		mg/L		05/24/19 11:46	05/29/19 20:05	1
Molybdenum	0.0036		0.00050		mg/L		05/24/19 11:46	05/29/19 06:25	1
Selenium	0.0091		0.00050		mg/L		05/24/19 11:46	05/29/19 20:05	1
Thallium	0.00025		0.00010		mg/L		05/24/19 11:46	05/29/19 06:25	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	8900	D2	100		mg/L			05/10/19 10:48	1
pH	7.4	H5	1.7		SU			05/14/19 15:45	1
Temperature	10.0	H5	0.1		Degrees C			05/14/19 15:45	1

Client Sample ID: FC-CCR-FD02-5719

Lab Sample ID: 550-122531-14

Date Collected: 05/07/19 09:54

Matrix: Water

Date Received: 05/09/19 06:45

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			05/15/19 09:37	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	54		0.050		mg/L		05/12/19 14:16	05/15/19 02:56	1
Calcium	380		2.0		mg/L		05/12/19 14:16	05/15/19 02:56	1
Lithium	0.29		0.20		mg/L		05/12/19 14:16	05/15/19 02:56	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0013		0.00050		mg/L		05/24/19 11:46	05/29/19 20:07	1
Barium	0.013	B7 D2	0.0010		mg/L		05/30/19 05:22	05/31/19 05:41	2
Cobalt	0.0018		0.00050		mg/L		05/24/19 11:46	05/29/19 20:07	1
Molybdenum	0.0036		0.00050		mg/L		05/24/19 11:46	05/29/19 06:27	1
Selenium	0.010		0.00050		mg/L		05/24/19 11:46	05/29/19 20:07	1
Thallium	0.00025		0.00010		mg/L		05/24/19 11:46	05/29/19 06:27	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	9000	D2	100		mg/L			05/10/19 10:48	1
pH	7.4	H5	1.7		SU			05/14/19 15:45	1
Temperature	11.1	H5	0.1		Degrees C			05/14/19 15:45	1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 550-177969/2
Matrix: Water
Analysis Batch: 177969

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.40		mg/L			05/14/19 16:08	1

Lab Sample ID: LCS 550-177969/5
Matrix: Water
Analysis Batch: 177969

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride			20.0	20.3		mg/L		101	90 - 110		
Fluoride			4.00	3.99		mg/L		100	90 - 110		
Sulfate			20.0	19.5		mg/L		98	90 - 110		

Lab Sample ID: LCSD 550-177969/6
Matrix: Water
Analysis Batch: 177969

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride			20.0	20.3		mg/L		102	90 - 110	0	20
Fluoride			4.00	3.98		mg/L		99	90 - 110	0	20
Sulfate			20.0	19.6		mg/L		98	90 - 110	0	20

Lab Sample ID: 550-122531-6 MS
Matrix: Water
Analysis Batch: 177969

Client Sample ID: FC-CCR-MW71-5719
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride	ND	D1 D5	8.00	7.82	D1	mg/L		94	80 - 120		

Lab Sample ID: 550-122531-6 MS
Matrix: Water
Analysis Batch: 177969

Client Sample ID: FC-CCR-MW71-5719
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride	470	D2	4000	4790	D2	mg/L		108	80 - 120		
Sulfate	9800	D2	4000	14000	D2	mg/L		106	80 - 120		

Lab Sample ID: 550-122531-6 MSD
Matrix: Water
Analysis Batch: 177969

Client Sample ID: FC-CCR-MW71-5719
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	ND	D1 D5	8.00	7.98	D1	mg/L		96	80 - 120	2	20

Lab Sample ID: 550-122531-6 MSD
Matrix: Water
Analysis Batch: 177969

Client Sample ID: FC-CCR-MW71-5719
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	470	D2	4000	4740	D2	mg/L		107	80 - 120	1	20
Sulfate	9800	D2	4000	13700	D2	mg/L		99	80 - 120	2	20

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 550-177721/1-A
Matrix: Water
Analysis Batch: 178074

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 177721

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.050		mg/L		05/12/19 14:16	05/15/19 01:25	1
Calcium	ND		2.0		mg/L		05/12/19 14:16	05/15/19 01:25	1
Lithium	ND		0.20		mg/L		05/12/19 14:16	05/15/19 01:25	1

Lab Sample ID: LCS 550-177721/2-A
Matrix: Water
Analysis Batch: 178074

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 177721

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Boron			1.00	0.977		mg/L		98	85 - 115		
Calcium			21.0	19.1		mg/L		91	85 - 115		
Lithium			1.00	1.07		mg/L		107	85 - 115		

Lab Sample ID: LCSD 550-177721/3-A
Matrix: Water
Analysis Batch: 178074

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 177721

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron			1.00	0.968		mg/L		97	85 - 115	1	20
Calcium			21.0	19.2		mg/L		91	85 - 115	0	20
Lithium			1.00	1.08		mg/L		108	85 - 115	1	20

Lab Sample ID: 550-122531-6 MS
Matrix: Water
Analysis Batch: 178074

Client Sample ID: FC-CCR-MW71-5719
Prep Type: Total/NA
Prep Batch: 177721

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Boron	0.50		1.00	1.52		mg/L		102	70 - 130		
Calcium	400	M3	21.0	402	M3	mg/L		-4	70 - 130		
Lithium	0.38		1.00	1.65		mg/L		127	70 - 130		

Lab Sample ID: 550-122531-6 MSD
Matrix: Water
Analysis Batch: 178074

Client Sample ID: FC-CCR-MW71-5719
Prep Type: Total/NA
Prep Batch: 177721

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	0.50		1.00	1.50		mg/L		100	70 - 130	2	20
Calcium	400	M3	21.0	406	M3	mg/L		13	70 - 130	1	20
Lithium	0.38		1.00	1.62		mg/L		125	70 - 130	2	20

Lab Sample ID: MB 550-177843/1-A
Matrix: Water
Analysis Batch: 178067

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 177843

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.050		mg/L		05/14/19 06:18	05/15/19 00:11	1
Calcium	ND		2.0		mg/L		05/14/19 06:18	05/15/19 00:11	1
Lithium	ND		0.20		mg/L		05/14/19 06:18	05/15/19 00:11	1

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: LCS 550-177843/2-A
Matrix: Water
Analysis Batch: 178067

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 177843

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Boron			1.00	0.957		mg/L		96	85 - 115		
Calcium			21.0	19.2		mg/L		91	85 - 115		
Lithium			1.00	1.03		mg/L		103	85 - 115		

Lab Sample ID: LCSD 550-177843/3-A
Matrix: Water
Analysis Batch: 178067

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 177843

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron			1.00	0.958		mg/L		96	85 - 115	0	20
Calcium			21.0	19.4		mg/L		92	85 - 115	1	20
Lithium			1.00	1.04		mg/L		104	85 - 115	0	20

Lab Sample ID: 550-122489-A-2-B MS
Matrix: Water
Analysis Batch: 178212

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 177843

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Boron	25		2.00	27.6	M3	mg/L		118	70 - 130		
Calcium	26		42.0	67.9		mg/L		100	70 - 130		
Lithium	0.83		2.00	2.87		mg/L		102	70 - 130		

Lab Sample ID: 550-122489-A-2-C MSD
Matrix: Water
Analysis Batch: 178212

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 177843

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	25		2.00	27.3	M3	mg/L		103	70 - 130	1	20
Calcium	26		42.0	66.9		mg/L		97	70 - 130	2	20
Lithium	0.83		2.00	2.76		mg/L		96	70 - 130	4	20

Method: 200.8 LL - Metals (ICP/MS)

Lab Sample ID: MB 550-177724/1-A
Matrix: Water
Analysis Batch: 178621

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 177724

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.00050		mg/L		05/12/19 16:22	05/21/19 01:29	1
Cobalt	ND		0.00050		mg/L		05/12/19 16:22	05/21/19 01:29	1
Molybdenum	ND		0.00050		mg/L		05/12/19 16:22	05/21/19 01:29	1
Selenium	ND		0.00050		mg/L		05/12/19 16:22	05/21/19 01:29	1
Thallium	ND		0.00010		mg/L		05/12/19 16:22	05/21/19 01:29	1

Lab Sample ID: LCS 550-177724/2-A
Matrix: Water
Analysis Batch: 178621

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 177724

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic			0.100	0.0996		mg/L		100	85 - 115		

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 550-177724/2-A
Matrix: Water
Analysis Batch: 178621

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 177724

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cobalt	0.100	0.101		mg/L		101	85 - 115
Molybdenum	0.100	0.103		mg/L		103	85 - 115
Selenium	0.100	0.0964		mg/L		96	85 - 115
Thallium	0.100	0.103		mg/L		103	85 - 115

Lab Sample ID: LCSD 550-177724/3-A
Matrix: Water
Analysis Batch: 178621

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 177724

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	0.100	0.0992		mg/L		99	85 - 115	0	20
Cobalt	0.100	0.101		mg/L		101	85 - 115	0	20
Molybdenum	0.100	0.103		mg/L		103	85 - 115	0	20
Selenium	0.100	0.0957		mg/L		96	85 - 115	1	20
Thallium	0.100	0.104		mg/L		104	85 - 115	1	20

Lab Sample ID: 550-122531-1 MS
Matrix: Water
Analysis Batch: 178621

Client Sample ID: FC-CCR-MW66-5719
Prep Type: Total/NA
Prep Batch: 177724

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	0.0020		0.100	0.121		mg/L		119	70 - 130
Cobalt	0.015		0.100	0.110		mg/L		95	70 - 130
Molybdenum	0.016		0.100	0.124		mg/L		108	70 - 130
Selenium	0.0021	M1	0.100	0.153	M1	mg/L		151	70 - 130
Thallium	0.0012		0.100	0.0964		mg/L		95	70 - 130

Lab Sample ID: 550-122531-1 MSD
Matrix: Water
Analysis Batch: 178621

Client Sample ID: FC-CCR-MW66-5719
Prep Type: Total/NA
Prep Batch: 177724

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	0.0020		0.100	0.120		mg/L		118	70 - 130	1	20
Cobalt	0.015		0.100	0.109		mg/L		94	70 - 130	1	20
Molybdenum	0.016		0.100	0.124		mg/L		107	70 - 130	0	20
Selenium	0.0021	M1	0.100	0.157	M1	mg/L		154	70 - 130	2	20
Thallium	0.0012		0.100	0.0964		mg/L		95	70 - 130	0	20

Lab Sample ID: MB 550-179066/1-A
Matrix: Water
Analysis Batch: 179362

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 179066

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.00050		mg/L		05/24/19 11:46	05/29/19 05:45	1
Cobalt	ND		0.00050		mg/L		05/24/19 11:46	05/29/19 05:45	1
Molybdenum	ND		0.00050		mg/L		05/24/19 11:46	05/29/19 05:45	1
Selenium	ND		0.00050		mg/L		05/24/19 11:46	05/29/19 05:45	1
Thallium	ND		0.00010		mg/L		05/24/19 11:46	05/29/19 05:45	1

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 550-179066/2-A
Matrix: Water
Analysis Batch: 179362

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 179066

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic			0.100	0.0969		mg/L		97	85 - 115		
Cobalt			0.100	0.0983		mg/L		98	85 - 115		
Molybdenum			0.100	0.0978		mg/L		98	85 - 115		
Selenium			0.100	0.0991		mg/L		99	85 - 115		
Thallium			0.100	0.0987		mg/L		99	85 - 115		

Lab Sample ID: LCSD 550-179066/3-A
Matrix: Water
Analysis Batch: 179362

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 179066

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic			0.100	0.0978		mg/L		98	85 - 115	1	20
Cobalt			0.100	0.0972		mg/L		97	85 - 115	1	20
Molybdenum			0.100	0.0963		mg/L		96	85 - 115	2	20
Selenium			0.100	0.0983		mg/L		98	85 - 115	1	20
Thallium			0.100	0.0973		mg/L		97	85 - 115	1	20

Lab Sample ID: 550-122531-4 MS
Matrix: Water
Analysis Batch: 179362

Client Sample ID: FC-CCR-MW69-5719
Prep Type: Total/NA
Prep Batch: 179066

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic	0.0021		0.100	0.119		mg/L		117	70 - 130		
Cobalt	0.0035		0.100	0.0958		mg/L		92	70 - 130		
Molybdenum	0.0099		0.100	0.110		mg/L		100	70 - 130		
Selenium	0.029	M1	0.100	0.191	M1	mg/L		162	70 - 130		
Thallium	0.00033		0.100	0.0878		mg/L		87	70 - 130		

Lab Sample ID: 550-122531-4 MSD
Matrix: Water
Analysis Batch: 179362

Client Sample ID: FC-CCR-MW69-5719
Prep Type: Total/NA
Prep Batch: 179066

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	0.0021		0.100	0.121		mg/L		119	70 - 130	1	20
Cobalt	0.0035		0.100	0.0955		mg/L		92	70 - 130	0	20
Molybdenum	0.0099		0.100	0.110		mg/L		100	70 - 130	1	20
Selenium	0.029	M1	0.100	0.190	M1	mg/L		161	70 - 130	1	20
Thallium	0.00033		0.100	0.0879		mg/L		88	70 - 130	0	20

Lab Sample ID: MB 550-179396/1-A
Matrix: Water
Analysis Batch: 179540

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 179396

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Barium	0.000543	B1	0.00050		mg/L		05/30/19 05:22	05/31/19 03:34	1

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 550-179396/1-A
Matrix: Water
Analysis Batch: 179543

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 179396

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Barium	0.000531	B1	0.00050		mg/L		05/30/19 05:22	05/31/19 05:20	1

Lab Sample ID: LCS 550-179396/2-A
Matrix: Water
Analysis Batch: 179540

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 179396

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Barium			0.100	0.103		mg/L		103	85 - 115		

Lab Sample ID: LCS 550-179396/2-A
Matrix: Water
Analysis Batch: 179543

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 179396

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Barium			0.100	0.101		mg/L		101	85 - 115		

Lab Sample ID: LCSD 550-179396/3-A
Matrix: Water
Analysis Batch: 179540

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 179396

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Barium			0.100	0.103		mg/L		103	85 - 115	0	20

Lab Sample ID: LCSD 550-179396/3-A
Matrix: Water
Analysis Batch: 179543

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 179396

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Barium			0.100	0.101		mg/L		101	85 - 115	1	20

Lab Sample ID: 550-123475-C-1-A MS
Matrix: Water
Analysis Batch: 179540

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 179396

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Barium	0.52	B7	0.100	0.617	M3	mg/L		101	70 - 130		

Lab Sample ID: 550-123475-C-1-A MS
Matrix: Water
Analysis Batch: 179543

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 179396

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Barium	0.52	B7	0.100	0.616	M3	mg/L		98	70 - 130		

Lab Sample ID: 550-123475-C-1-B MSD
Matrix: Water
Analysis Batch: 179540

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 179396

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Barium	0.52	B7	0.100	0.612	M3	mg/L		95	70 - 130	1	20

Method: 200.8 LL - Metals (ICP/MS)

Lab Sample ID: 550-123475-C-1-B MSD
Matrix: Water
Analysis Batch: 179543

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 179396

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Barium	0.52	B7	0.100	0.615	M3	mg/L		97	70 - 130	0	20

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

Lab Sample ID: MB 550-177608/1
Matrix: Water
Analysis Batch: 177608

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		20		mg/L			05/10/19 10:48	1

Lab Sample ID: LCS 550-177608/2
Matrix: Water
Analysis Batch: 177608

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Dissolved Solids			1000	950		mg/L		95	90 - 110		

Lab Sample ID: LCSD 550-177608/3
Matrix: Water
Analysis Batch: 177608

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids			1000	1010		mg/L		101	90 - 110	7	10

Lab Sample ID: 550-122532-A-1 DU
Matrix: Water
Analysis Batch: 177608

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	5800	D2		5450	D2	mg/L				5	10

Lab Sample ID: MB 550-177750/1
Matrix: Water
Analysis Batch: 177750

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		20		mg/L			05/13/19 10:08	1

Lab Sample ID: LCS 550-177750/2
Matrix: Water
Analysis Batch: 177750

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Dissolved Solids			1000	986		mg/L		99	90 - 110		

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

Lab Sample ID: LCSD 550-177750/3
Matrix: Water
Analysis Batch: 177750

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids			1000	972		mg/L		97	90 - 110	1	10

Lab Sample ID: 550-122531-6 DU
Matrix: Water
Analysis Batch: 177750

Client Sample ID: FC-CCR-MW71-5719
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	16000	D2		15200	D2	mg/L				5	10

Method: SM 4500 H+ B - pH

Lab Sample ID: LCSSRM 550-177820/1
Matrix: Water
Analysis Batch: 177820

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

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.0		SU		100.0	98.5 - 101.5		

Lab Sample ID: LCSSRM 550-177820/12
Matrix: Water
Analysis Batch: 177820

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

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.0		SU		100.6	98.5 - 101.5		

Lab Sample ID: 550-122596-F-1 DU
Matrix: Water
Analysis Batch: 177820

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	7.8	H5		7.9	H5	SU				0.4	5
Temperature	19.5	H5		19.4	H5	Degrees C				0.5	

Lab Sample ID: LCSSRM 550-177970/1
Matrix: Water
Analysis Batch: 177970

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

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.0		SU		100.0	98.5 - 101.5		

Lab Sample ID: LCSSRM 550-177970/13
Matrix: Water
Analysis Batch: 177970

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

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.1		SU		100.7	98.5 - 101.5		

Client: Arizona Public Service Company
Project/Site: APS - Four Corners CCR

Job ID: 550-122531-1

Method: SM 4500 H+ B - pH (Continued)

Lab Sample ID: 550-122531-6 DU
Matrix: Water
Analysis Batch: 177970

Client Sample ID: FC-CCR-MW71-5719
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	7.5	H5		7.5	H5	SU				0	5
Temperature	6.1	H5		6.4	H5	Degrees C				5	

HPLC/IC

Analysis Batch: 177969

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122531-1	FC-CCR-MW66-5719	Total/NA	Water	300.0	
550-122531-2	FC-CCR-MW67-5719	Total/NA	Water	300.0	
550-122531-3	FC-CCR-MW68-5719	Total/NA	Water	300.0	
550-122531-4	FC-CCR-MW69-5719	Total/NA	Water	300.0	
550-122531-5	FC-CCR-MW70-5719	Total/NA	Water	300.0	
550-122531-6	FC-CCR-MW71-5719	Total/NA	Water	300.0	
550-122531-7	FC-CCR-MW72-5719	Total/NA	Water	300.0	
550-122531-8	FC-CCR-MW73-5619	Total/NA	Water	300.0	
550-122531-9	FC-CCR-MW83-5619	Total/NA	Water	300.0	
550-122531-10	FC-CCR-FD01-5619	Total/NA	Water	300.0	
550-122531-11	FC-CCR-MW84-5719	Total/NA	Water	300.0	
550-122531-12	FC-CCR-MW85-5719	Total/NA	Water	300.0	
550-122531-13	FC-CCR-MW86-5719	Total/NA	Water	300.0	
550-122531-14	FC-CCR-FD02-5719	Total/NA	Water	300.0	
MB 550-177969/2	Method Blank	Total/NA	Water	300.0	
LCS 550-177969/5	Lab Control Sample	Total/NA	Water	300.0	
LCSD 550-177969/6	Lab Control Sample Dup	Total/NA	Water	300.0	
550-122531-6 MS	FC-CCR-MW71-5719	Total/NA	Water	300.0	
550-122531-6 MS	FC-CCR-MW71-5719	Total/NA	Water	300.0	
550-122531-6 MSD	FC-CCR-MW71-5719	Total/NA	Water	300.0	
550-122531-6 MSD	FC-CCR-MW71-5719	Total/NA	Water	300.0	

Metals

Prep Batch: 177721

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122531-2	FC-CCR-MW67-5719	Total/NA	Water	200.7	
550-122531-3	FC-CCR-MW68-5719	Total/NA	Water	200.7	
550-122531-4	FC-CCR-MW69-5719	Total/NA	Water	200.7	
550-122531-5	FC-CCR-MW70-5719	Total/NA	Water	200.7	
550-122531-6	FC-CCR-MW71-5719	Total/NA	Water	200.7	
550-122531-7	FC-CCR-MW72-5719	Total/NA	Water	200.7	
550-122531-8	FC-CCR-MW73-5619	Total/NA	Water	200.7	
550-122531-9	FC-CCR-MW83-5619	Total/NA	Water	200.7	
550-122531-10	FC-CCR-FD01-5619	Total/NA	Water	200.7	
550-122531-11	FC-CCR-MW84-5719	Total/NA	Water	200.7	
550-122531-12	FC-CCR-MW85-5719	Total/NA	Water	200.7	
550-122531-13	FC-CCR-MW86-5719	Total/NA	Water	200.7	
550-122531-14	FC-CCR-FD02-5719	Total/NA	Water	200.7	
MB 550-177721/1-A	Method Blank	Total/NA	Water	200.7	
LCS 550-177721/2-A	Lab Control Sample	Total/NA	Water	200.7	
LCSD 550-177721/3-A	Lab Control Sample Dup	Total/NA	Water	200.7	
550-122531-6 MS	FC-CCR-MW71-5719	Total/NA	Water	200.7	
550-122531-6 MSD	FC-CCR-MW71-5719	Total/NA	Water	200.7	

Prep Batch: 177724

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122531-1	FC-CCR-MW66-5719	Total/NA	Water	200.8	
550-122531-6	FC-CCR-MW71-5719	Total/NA	Water	200.8	
MB 550-177724/1-A	Method Blank	Total/NA	Water	200.8	
LCS 550-177724/2-A	Lab Control Sample	Total/NA	Water	200.8	

Metals (Continued)

Prep Batch: 177724 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 550-177724/3-A	Lab Control Sample Dup	Total/NA	Water	200.8	
550-122531-1 MS	FC-CCR-MW66-5719	Total/NA	Water	200.8	
550-122531-1 MSD	FC-CCR-MW66-5719	Total/NA	Water	200.8	

Prep Batch: 177843

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122531-1	FC-CCR-MW66-5719	Total/NA	Water	200.7	
MB 550-177843/1-A	Method Blank	Total/NA	Water	200.7	
LCS 550-177843/2-A	Lab Control Sample	Total/NA	Water	200.7	
LCSD 550-177843/3-A	Lab Control Sample Dup	Total/NA	Water	200.7	
550-122489-A-2-B MS	Matrix Spike	Total/NA	Water	200.7	
550-122489-A-2-C MSD	Matrix Spike Duplicate	Total/NA	Water	200.7	

Analysis Batch: 178067

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122531-1	FC-CCR-MW66-5719	Total/NA	Water	200.7 Rev 4.4	177843
MB 550-177843/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	177843
LCS 550-177843/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	177843
LCSD 550-177843/3-A	Lab Control Sample Dup	Total/NA	Water	200.7 Rev 4.4	177843

Analysis Batch: 178074

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122531-2	FC-CCR-MW67-5719	Total/NA	Water	200.7 Rev 4.4	177721
550-122531-3	FC-CCR-MW68-5719	Total/NA	Water	200.7 Rev 4.4	177721
550-122531-4	FC-CCR-MW69-5719	Total/NA	Water	200.7 Rev 4.4	177721
550-122531-5	FC-CCR-MW70-5719	Total/NA	Water	200.7 Rev 4.4	177721
550-122531-6	FC-CCR-MW71-5719	Total/NA	Water	200.7 Rev 4.4	177721
550-122531-7	FC-CCR-MW72-5719	Total/NA	Water	200.7 Rev 4.4	177721
550-122531-8	FC-CCR-MW73-5619	Total/NA	Water	200.7 Rev 4.4	177721
550-122531-9	FC-CCR-MW83-5619	Total/NA	Water	200.7 Rev 4.4	177721
550-122531-10	FC-CCR-FD01-5619	Total/NA	Water	200.7 Rev 4.4	177721
550-122531-11	FC-CCR-MW84-5719	Total/NA	Water	200.7 Rev 4.4	177721
550-122531-12	FC-CCR-MW85-5719	Total/NA	Water	200.7 Rev 4.4	177721
550-122531-13	FC-CCR-MW86-5719	Total/NA	Water	200.7 Rev 4.4	177721
550-122531-14	FC-CCR-FD02-5719	Total/NA	Water	200.7 Rev 4.4	177721
MB 550-177721/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	177721
LCS 550-177721/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	177721
LCSD 550-177721/3-A	Lab Control Sample Dup	Total/NA	Water	200.7 Rev 4.4	177721
550-122531-6 MS	FC-CCR-MW71-5719	Total/NA	Water	200.7 Rev 4.4	177721
550-122531-6 MSD	FC-CCR-MW71-5719	Total/NA	Water	200.7 Rev 4.4	177721

Analysis Batch: 178212

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122531-1	FC-CCR-MW66-5719	Total/NA	Water	200.7 Rev 4.4	177843
550-122489-A-2-B MS	Matrix Spike	Total/NA	Water	200.7 Rev 4.4	177843
550-122489-A-2-C MSD	Matrix Spike Duplicate	Total/NA	Water	200.7 Rev 4.4	177843

Analysis Batch: 178437

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122531-2	FC-CCR-MW67-5719	Total/NA	Water	200.7 Rev 4.4	177721
550-122531-3	FC-CCR-MW68-5719	Total/NA	Water	200.7 Rev 4.4	177721

Metals (Continued)

Analysis Batch: 178437 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122531-11	FC-CCR-MW84-5719	Total/NA	Water	200.7 Rev 4.4	177721

Analysis Batch: 178621

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122531-1	FC-CCR-MW66-5719	Total/NA	Water	200.8 LL	177724
550-122531-6	FC-CCR-MW71-5719	Total/NA	Water	200.8 LL	177724
MB 550-177724/1-A	Method Blank	Total/NA	Water	200.8 LL	177724
LCS 550-177724/2-A	Lab Control Sample	Total/NA	Water	200.8 LL	177724
LCSD 550-177724/3-A	Lab Control Sample Dup	Total/NA	Water	200.8 LL	177724
550-122531-1 MS	FC-CCR-MW66-5719	Total/NA	Water	200.8 LL	177724
550-122531-1 MSD	FC-CCR-MW66-5719	Total/NA	Water	200.8 LL	177724

Prep Batch: 179066

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122531-2	FC-CCR-MW67-5719	Total/NA	Water	200.8	
550-122531-3	FC-CCR-MW68-5719	Total/NA	Water	200.8	
550-122531-4	FC-CCR-MW69-5719	Total/NA	Water	200.8	
550-122531-5	FC-CCR-MW70-5719	Total/NA	Water	200.8	
550-122531-7	FC-CCR-MW72-5719	Total/NA	Water	200.8	
550-122531-8	FC-CCR-MW73-5619	Total/NA	Water	200.8	
550-122531-9	FC-CCR-MW83-5619	Total/NA	Water	200.8	
550-122531-10	FC-CCR-FD01-5619	Total/NA	Water	200.8	
550-122531-11	FC-CCR-MW84-5719	Total/NA	Water	200.8	
550-122531-12	FC-CCR-MW85-5719	Total/NA	Water	200.8	
550-122531-13	FC-CCR-MW86-5719	Total/NA	Water	200.8	
550-122531-14	FC-CCR-FD02-5719	Total/NA	Water	200.8	
MB 550-179066/1-A	Method Blank	Total/NA	Water	200.8	
LCS 550-179066/2-A	Lab Control Sample	Total/NA	Water	200.8	
LCSD 550-179066/3-A	Lab Control Sample Dup	Total/NA	Water	200.8	
550-122531-4 MS	FC-CCR-MW69-5719	Total/NA	Water	200.8	
550-122531-4 MSD	FC-CCR-MW69-5719	Total/NA	Water	200.8	

Analysis Batch: 179362

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122531-2	FC-CCR-MW67-5719	Total/NA	Water	200.8 LL	179066
550-122531-3	FC-CCR-MW68-5719	Total/NA	Water	200.8 LL	179066
550-122531-4	FC-CCR-MW69-5719	Total/NA	Water	200.8 LL	179066
550-122531-5	FC-CCR-MW70-5719	Total/NA	Water	200.8 LL	179066
550-122531-7	FC-CCR-MW72-5719	Total/NA	Water	200.8 LL	179066
550-122531-8	FC-CCR-MW73-5619	Total/NA	Water	200.8 LL	179066
550-122531-9	FC-CCR-MW83-5619	Total/NA	Water	200.8 LL	179066
550-122531-10	FC-CCR-FD01-5619	Total/NA	Water	200.8 LL	179066
550-122531-11	FC-CCR-MW84-5719	Total/NA	Water	200.8 LL	179066
550-122531-12	FC-CCR-MW85-5719	Total/NA	Water	200.8 LL	179066
550-122531-13	FC-CCR-MW86-5719	Total/NA	Water	200.8 LL	179066
550-122531-14	FC-CCR-FD02-5719	Total/NA	Water	200.8 LL	179066
MB 550-179066/1-A	Method Blank	Total/NA	Water	200.8 LL	179066
LCS 550-179066/2-A	Lab Control Sample	Total/NA	Water	200.8 LL	179066
LCSD 550-179066/3-A	Lab Control Sample Dup	Total/NA	Water	200.8 LL	179066
550-122531-4 MS	FC-CCR-MW69-5719	Total/NA	Water	200.8 LL	179066
550-122531-4 MSD	FC-CCR-MW69-5719	Total/NA	Water	200.8 LL	179066

Metals

Analysis Batch: 179390

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122531-11	FC-CCR-MW84-5719	Total/NA	Water	200.8 LL	179066
550-122531-12	FC-CCR-MW85-5719	Total/NA	Water	200.8 LL	179066
550-122531-13	FC-CCR-MW86-5719	Total/NA	Water	200.8 LL	179066
550-122531-14	FC-CCR-FD02-5719	Total/NA	Water	200.8 LL	179066

Prep Batch: 179396

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122531-1	FC-CCR-MW66-5719	Total/NA	Water	200.8	
550-122531-2	FC-CCR-MW67-5719	Total/NA	Water	200.8	
550-122531-3	FC-CCR-MW68-5719	Total/NA	Water	200.8	
550-122531-4	FC-CCR-MW69-5719	Total/NA	Water	200.8	
550-122531-5	FC-CCR-MW70-5719	Total/NA	Water	200.8	
550-122531-6	FC-CCR-MW71-5719	Total/NA	Water	200.8	
550-122531-7	FC-CCR-MW72-5719	Total/NA	Water	200.8	
550-122531-8	FC-CCR-MW73-5619	Total/NA	Water	200.8	
550-122531-9	FC-CCR-MW83-5619	Total/NA	Water	200.8	
550-122531-10	FC-CCR-FD01-5619	Total/NA	Water	200.8	
550-122531-11	FC-CCR-MW84-5719	Total/NA	Water	200.8	
550-122531-12	FC-CCR-MW85-5719	Total/NA	Water	200.8	
550-122531-13	FC-CCR-MW86-5719	Total/NA	Water	200.8	
550-122531-14	FC-CCR-FD02-5719	Total/NA	Water	200.8	
MB 550-179396/1-A	Method Blank	Total/NA	Water	200.8	
LCS 550-179396/2-A	Lab Control Sample	Total/NA	Water	200.8	
LCSD 550-179396/3-A	Lab Control Sample Dup	Total/NA	Water	200.8	
550-123475-C-1-A MS	Matrix Spike	Total/NA	Water	200.8	
550-123475-C-1-B MSD	Matrix Spike Duplicate	Total/NA	Water	200.8	

Analysis Batch: 179540

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122531-1	FC-CCR-MW66-5719	Total/NA	Water	200.8 LL	179396
550-122531-2	FC-CCR-MW67-5719	Total/NA	Water	200.8 LL	179396
550-122531-3	FC-CCR-MW68-5719	Total/NA	Water	200.8 LL	179396
550-122531-4	FC-CCR-MW69-5719	Total/NA	Water	200.8 LL	179396
550-122531-5	FC-CCR-MW70-5719	Total/NA	Water	200.8 LL	179396
550-122531-6	FC-CCR-MW71-5719	Total/NA	Water	200.8 LL	179396
550-122531-7	FC-CCR-MW72-5719	Total/NA	Water	200.8 LL	179396
550-122531-8	FC-CCR-MW73-5619	Total/NA	Water	200.8 LL	179396
550-122531-9	FC-CCR-MW83-5619	Total/NA	Water	200.8 LL	179396
550-122531-10	FC-CCR-FD01-5619	Total/NA	Water	200.8 LL	179396
MB 550-179396/1-A	Method Blank	Total/NA	Water	200.8 LL	179396
LCS 550-179396/2-A	Lab Control Sample	Total/NA	Water	200.8 LL	179396
LCSD 550-179396/3-A	Lab Control Sample Dup	Total/NA	Water	200.8 LL	179396
550-123475-C-1-A MS	Matrix Spike	Total/NA	Water	200.8 LL	179396
550-123475-C-1-B MSD	Matrix Spike Duplicate	Total/NA	Water	200.8 LL	179396

Analysis Batch: 179543

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122531-11	FC-CCR-MW84-5719	Total/NA	Water	200.8 LL	179396
550-122531-12	FC-CCR-MW85-5719	Total/NA	Water	200.8 LL	179396
550-122531-13	FC-CCR-MW86-5719	Total/NA	Water	200.8 LL	179396
550-122531-14	FC-CCR-FD02-5719	Total/NA	Water	200.8 LL	179396

Metals (Continued)

Analysis Batch: 179543 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 550-179396/1-A	Method Blank	Total/NA	Water	200.8 LL	179396
LCS 550-179396/2-A	Lab Control Sample	Total/NA	Water	200.8 LL	179396
LCSD 550-179396/3-A	Lab Control Sample Dup	Total/NA	Water	200.8 LL	179396
550-123475-C-1-A MS	Matrix Spike	Total/NA	Water	200.8 LL	179396
550-123475-C-1-B MSD	Matrix Spike Duplicate	Total/NA	Water	200.8 LL	179396

General Chemistry

Analysis Batch: 177608

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122531-2	FC-CCR-MW67-5719	Total/NA	Water	SM 2540C	
550-122531-4	FC-CCR-MW69-5719	Total/NA	Water	SM 2540C	
550-122531-5	FC-CCR-MW70-5719	Total/NA	Water	SM 2540C	
550-122531-7	FC-CCR-MW72-5719	Total/NA	Water	SM 2540C	
550-122531-8	FC-CCR-MW73-5619	Total/NA	Water	SM 2540C	
550-122531-9	FC-CCR-MW83-5619	Total/NA	Water	SM 2540C	
550-122531-10	FC-CCR-FD01-5619	Total/NA	Water	SM 2540C	
550-122531-11	FC-CCR-MW84-5719	Total/NA	Water	SM 2540C	
550-122531-12	FC-CCR-MW85-5719	Total/NA	Water	SM 2540C	
550-122531-13	FC-CCR-MW86-5719	Total/NA	Water	SM 2540C	
550-122531-14	FC-CCR-FD02-5719	Total/NA	Water	SM 2540C	
MB 550-177608/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 550-177608/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 550-177608/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	
550-122532-A-1 DU	Duplicate	Total/NA	Water	SM 2540C	

Analysis Batch: 177750

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122531-1	FC-CCR-MW66-5719	Total/NA	Water	SM 2540C	
550-122531-3	FC-CCR-MW68-5719	Total/NA	Water	SM 2540C	
550-122531-6	FC-CCR-MW71-5719	Total/NA	Water	SM 2540C	
MB 550-177750/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 550-177750/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 550-177750/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	
550-122531-6 DU	FC-CCR-MW71-5719	Total/NA	Water	SM 2540C	

Analysis Batch: 177820

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122531-1	FC-CCR-MW66-5719	Total/NA	Water	SM 4500 H+ B	
550-122531-2	FC-CCR-MW67-5719	Total/NA	Water	SM 4500 H+ B	
550-122531-3	FC-CCR-MW68-5719	Total/NA	Water	SM 4500 H+ B	
550-122531-4	FC-CCR-MW69-5719	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-177820/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-177820/12	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
550-122596-F-1 DU	Duplicate	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 177970

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122531-5	FC-CCR-MW70-5719	Total/NA	Water	SM 4500 H+ B	
550-122531-6	FC-CCR-MW71-5719	Total/NA	Water	SM 4500 H+ B	
550-122531-7	FC-CCR-MW72-5719	Total/NA	Water	SM 4500 H+ B	

General Chemistry (Continued)

Analysis Batch: 177970 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122531-8	FC-CCR-MW73-5619	Total/NA	Water	SM 4500 H+ B	
550-122531-9	FC-CCR-MW83-5619	Total/NA	Water	SM 4500 H+ B	
550-122531-10	FC-CCR-FD01-5619	Total/NA	Water	SM 4500 H+ B	
550-122531-11	FC-CCR-MW84-5719	Total/NA	Water	SM 4500 H+ B	
550-122531-12	FC-CCR-MW85-5719	Total/NA	Water	SM 4500 H+ B	
550-122531-13	FC-CCR-MW86-5719	Total/NA	Water	SM 4500 H+ B	
550-122531-14	FC-CCR-FD02-5719	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-177970/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-177970/13	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
550-122531-6 DU	FC-CCR-MW71-5719	Total/NA	Water	SM 4500 H+ B	

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: APS - Four Corners CCR

Job ID: 550-122531-1

Client Sample ID: FC-CCR-MW66-5719

Lab Sample ID: 550-122531-1

Date Collected: 05/07/19 10:39

Matrix: Water

Date Received: 05/09/19 06:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	177969	05/14/19 22:35	NEL	TAL PHX
Total/NA	Prep	200.7			177843	05/14/19 06:18	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178067	05/15/19 00:37	SRA	TAL PHX
Total/NA	Prep	200.7			177843	05/14/19 06:18	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		4	178212	05/15/19 19:40	SRA	TAL PHX
Total/NA	Prep	200.8			177724	05/12/19 16:22	BCV	TAL PHX
Total/NA	Analysis	200.8 LL		1	178621	05/21/19 01:39	ARE	TAL PHX
Total/NA	Prep	200.8			179396	05/30/19 05:22	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179540	05/31/19 03:57	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	177750		YET	TAL PHX
						(Start) 05/13/19 10:08		
						(End) 05/14/19 11:00		
Total/NA	Analysis	SM 4500 H+ B		1	177820	05/13/19 15:10	MRR	TAL PHX

Client Sample ID: FC-CCR-MW67-5719

Lab Sample ID: 550-122531-2

Date Collected: 05/07/19 16:37

Matrix: Water

Date Received: 05/09/19 06:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	177969	05/14/19 23:11	NEL	TAL PHX
Total/NA	Prep	200.7			177721	05/12/19 14:16	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178074	05/15/19 01:51	SRA	TAL PHX
Total/NA	Prep	200.7			177721	05/12/19 14:16	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		2	178437	05/17/19 15:58	SRA	TAL PHX
Total/NA	Prep	200.8			179066	05/24/19 11:46	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179362	05/29/19 06:00	ARE	TAL PHX
Total/NA	Prep	200.8			179396	05/30/19 05:22	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179540	05/31/19 03:59	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	177608		YET	TAL PHX
						(Start) 05/10/19 10:48		
						(End) 05/13/19 10:05		
Total/NA	Analysis	SM 4500 H+ B		1	177820	05/13/19 15:10	MRR	TAL PHX

Client Sample ID: FC-CCR-MW68-5719

Lab Sample ID: 550-122531-3

Date Collected: 05/07/19 14:46

Matrix: Water

Date Received: 05/09/19 06:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	177969	05/14/19 23:48	NEL	TAL PHX
Total/NA	Prep	200.7			177721	05/12/19 14:16	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178074	05/15/19 01:57	SRA	TAL PHX
Total/NA	Prep	200.7			177721	05/12/19 14:16	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		2	178437	05/17/19 16:04	SRA	TAL PHX
Total/NA	Prep	200.8			179066	05/24/19 11:46	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179362	05/29/19 06:02	ARE	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: APS - Four Corners CCR

Job ID: 550-122531-1

Client Sample ID: FC-CCR-MW68-5719

Lab Sample ID: 550-122531-3

Date Collected: 05/07/19 14:46

Matrix: Water

Date Received: 05/09/19 06:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.8			179396	05/30/19 05:22	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179540	05/31/19 04:01	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	177750		YET	TAL PHX
					(Start)	05/13/19 10:08		
					(End)	05/14/19 11:00		
Total/NA	Analysis	SM 4500 H+ B		1	177820	05/13/19 15:10	MRR	TAL PHX

Client Sample ID: FC-CCR-MW69-5719

Lab Sample ID: 550-122531-4

Date Collected: 05/07/19 15:39

Matrix: Water

Date Received: 05/09/19 06:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	177969	05/15/19 01:02	NEL	TAL PHX
Total/NA	Prep	200.7			177721	05/12/19 14:16	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178074	05/15/19 02:03	SRA	TAL PHX
Total/NA	Prep	200.8			179066	05/24/19 11:46	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179362	05/29/19 05:56	ARE	TAL PHX
Total/NA	Prep	200.8			179396	05/30/19 05:22	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179540	05/31/19 04:03	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	177608		YET	TAL PHX
					(Start)	05/10/19 10:48		
					(End)	05/13/19 10:05		
Total/NA	Analysis	SM 4500 H+ B		1	177820	05/13/19 15:10	MRR	TAL PHX

Client Sample ID: FC-CCR-MW70-5719

Lab Sample ID: 550-122531-5

Date Collected: 05/07/19 13:09

Matrix: Water

Date Received: 05/09/19 06:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	177969	05/15/19 01:39	NEL	TAL PHX
Total/NA	Prep	200.7			177721	05/12/19 14:16	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178074	05/15/19 02:09	SRA	TAL PHX
Total/NA	Prep	200.8			179066	05/24/19 11:46	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179362	05/29/19 06:04	ARE	TAL PHX
Total/NA	Prep	200.8			179396	05/30/19 05:22	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179540	05/31/19 04:09	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	177608		YET	TAL PHX
					(Start)	05/10/19 10:48		
					(End)	05/13/19 10:05		
Total/NA	Analysis	SM 4500 H+ B		1	177970	05/14/19 15:45	MRR	TAL PHX

Client Sample ID: FC-CCR-MW71-5719

Lab Sample ID: 550-122531-6

Date Collected: 05/06/19 20:11

Matrix: Water

Date Received: 05/09/19 06:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	177969	05/15/19 02:15	NEL	TAL PHX
Total/NA	Prep	200.7			177721	05/12/19 14:16	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178074	05/15/19 01:45	SRA	TAL PHX
Total/NA	Prep	200.8			177724	05/12/19 16:22	BCV	TAL PHX
Total/NA	Analysis	200.8 LL		1	178621	05/21/19 01:41	ARE	TAL PHX
Total/NA	Prep	200.8			179396	05/30/19 05:22	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179540	05/31/19 04:12	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	177750		YET	TAL PHX
					(Start)	05/13/19 10:08		
					(End)	05/14/19 11:00		
Total/NA	Analysis	SM 4500 H+ B		1	177970	05/14/19 15:45	MRR	TAL PHX

Client Sample ID: FC-CCR-MW72-5719

Lab Sample ID: 550-122531-7

Date Collected: 05/07/19 14:03

Matrix: Water

Date Received: 05/09/19 06:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	177969	05/15/19 04:43	NEL	TAL PHX
Total/NA	Prep	200.7			177721	05/12/19 14:16	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178074	05/15/19 02:15	SRA	TAL PHX
Total/NA	Prep	200.8			179066	05/24/19 11:46	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179362	05/29/19 06:12	ARE	TAL PHX
Total/NA	Prep	200.8			179396	05/30/19 05:22	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179540	05/31/19 04:14	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	177608		YET	TAL PHX
					(Start)	05/10/19 10:48		
					(End)	05/13/19 10:05		
Total/NA	Analysis	SM 4500 H+ B		1	177970	05/14/19 15:45	MRR	TAL PHX

Client Sample ID: FC-CCR-MW73-5619

Lab Sample ID: 550-122531-8

Date Collected: 05/06/19 19:18

Matrix: Water

Date Received: 05/09/19 06:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	177969	05/15/19 05:19	NEL	TAL PHX
Total/NA	Prep	200.7			177721	05/12/19 14:16	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178074	05/15/19 02:21	SRA	TAL PHX
Total/NA	Prep	200.8			179066	05/24/19 11:46	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179362	05/29/19 06:15	ARE	TAL PHX
Total/NA	Prep	200.8			179396	05/30/19 05:22	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179540	05/31/19 04:16	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	177608		YET	TAL PHX
					(Start)	05/10/19 10:48		
					(End)	05/13/19 10:05		
Total/NA	Analysis	SM 4500 H+ B		1	177970	05/14/19 15:45	MRR	TAL PHX

Client Sample ID: FC-CCR-MW83-5619

Lab Sample ID: 550-122531-9

Date Collected: 05/06/19 18:19

Matrix: Water

Date Received: 05/09/19 06:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	177969	05/15/19 05:56	NEL	TAL PHX
Total/NA	Prep	200.7			177721	05/12/19 14:16	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178074	05/15/19 02:27	SRA	TAL PHX
Total/NA	Prep	200.8			179066	05/24/19 11:46	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179362	05/29/19 06:17	ARE	TAL PHX
Total/NA	Prep	200.8			179396	05/30/19 05:22	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179540	05/31/19 04:18	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	177608		YET	TAL PHX
						(Start) 05/10/19 10:48		
						(End) 05/13/19 10:05		
Total/NA	Analysis	SM 4500 H+ B		1	177970	05/14/19 15:45	MRR	TAL PHX

Client Sample ID: FC-CCR-FD01-5619

Lab Sample ID: 550-122531-10

Date Collected: 05/06/19 18:19

Matrix: Water

Date Received: 05/09/19 06:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	177969	05/15/19 06:33	NEL	TAL PHX
Total/NA	Prep	200.7			177721	05/12/19 14:16	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178074	05/15/19 02:29	SRA	TAL PHX
Total/NA	Prep	200.8			179066	05/24/19 11:46	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179362	05/29/19 06:19	ARE	TAL PHX
Total/NA	Prep	200.8			179396	05/30/19 05:22	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179540	05/31/19 04:20	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	177608		YET	TAL PHX
						(Start) 05/10/19 10:48		
						(End) 05/13/19 10:05		
Total/NA	Analysis	SM 4500 H+ B		1	177970	05/14/19 15:45	MRR	TAL PHX

Client Sample ID: FC-CCR-MW84-5719

Lab Sample ID: 550-122531-11

Date Collected: 05/07/19 16:11

Matrix: Water

Date Received: 05/09/19 06:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	177969	05/15/19 07:10	NEL	TAL PHX
Total/NA	Prep	200.7			177721	05/12/19 14:16	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178074	05/15/19 02:32	SRA	TAL PHX
Total/NA	Prep	200.7			177721	05/12/19 14:16	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		2	178437	05/17/19 16:10	SRA	TAL PHX
Total/NA	Prep	200.8			179066	05/24/19 11:46	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179362	05/29/19 06:21	ARE	TAL PHX
Total/NA	Prep	200.8			179066	05/24/19 11:46	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179390	05/29/19 20:01	ARE	TAL PHX
Total/NA	Prep	200.8			179396	05/30/19 05:22	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		2	179543	05/31/19 05:34	ARE	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: APS - Four Corners CCR

Job ID: 550-122531-1

Client Sample ID: FC-CCR-MW84-5719

Lab Sample ID: 550-122531-11

Date Collected: 05/07/19 16:11

Matrix: Water

Date Received: 05/09/19 06:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540C		1	177608		YET	TAL PHX
Total/NA	Analysis	SM 4500 H+ B		1	177970	05/14/19 15:45	MRR	TAL PHX

Client Sample ID: FC-CCR-MW85-5719

Lab Sample ID: 550-122531-12

Date Collected: 05/07/19 17:19

Matrix: Water

Date Received: 05/09/19 06:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	177969	05/15/19 08:23	NEL	TAL PHX
Total/NA	Prep	200.7			177721	05/12/19 14:16	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178074	05/15/19 02:44	SRA	TAL PHX
Total/NA	Prep	200.8			179066	05/24/19 11:46	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179362	05/29/19 06:23	ARE	TAL PHX
Total/NA	Prep	200.8			179066	05/24/19 11:46	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179390	05/29/19 20:03	ARE	TAL PHX
Total/NA	Prep	200.8			179396	05/30/19 05:22	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		2	179543	05/31/19 05:36	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	177608		YET	TAL PHX
					(Start)	05/10/19 10:48		
					(End)	05/13/19 10:05		
Total/NA	Analysis	SM 4500 H+ B		1	177970	05/14/19 15:45	MRR	TAL PHX

Client Sample ID: FC-CCR-MW86-5719

Lab Sample ID: 550-122531-13

Date Collected: 05/07/19 09:54

Matrix: Water

Date Received: 05/09/19 06:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	177969	05/15/19 09:00	NEL	TAL PHX
Total/NA	Prep	200.7			177721	05/12/19 14:16	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178074	05/15/19 02:50	SRA	TAL PHX
Total/NA	Prep	200.8			179066	05/24/19 11:46	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179362	05/29/19 06:25	ARE	TAL PHX
Total/NA	Prep	200.8			179066	05/24/19 11:46	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179390	05/29/19 20:05	ARE	TAL PHX
Total/NA	Prep	200.8			179396	05/30/19 05:22	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		2	179543	05/31/19 05:39	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	177608		YET	TAL PHX
					(Start)	05/10/19 10:48		
					(End)	05/13/19 10:05		
Total/NA	Analysis	SM 4500 H+ B		1	177970	05/14/19 15:45	MRR	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: APS - Four Corners CCR

Job ID: 550-122531-1

Client Sample ID: FC-CCR-FD02-5719
Date Collected: 05/07/19 09:54
Date Received: 05/09/19 06:45

Lab Sample ID: 550-122531-14
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	177969	05/15/19 09:37	NEL	TAL PHX
Total/NA	Prep	200.7			177721	05/12/19 14:16	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178074	05/15/19 02:56	SRA	TAL PHX
Total/NA	Prep	200.8			179066	05/24/19 11:46	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179362	05/29/19 06:27	ARE	TAL PHX
Total/NA	Prep	200.8			179066	05/24/19 11:46	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179390	05/29/19 20:07	ARE	TAL PHX
Total/NA	Prep	200.8			179396	05/30/19 05:22	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		2	179543	05/31/19 05:41	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	177608		YET	TAL PHX
						(Start) 05/10/19 10:48		
						(End) 05/13/19 10:05		
Total/NA	Analysis	SM 4500 H+ B		1	177970	05/14/19 15:45	MRR	TAL PHX

Laboratory References:

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

Accreditation/Certification Summary

Client: Arizona Public Service Company
Job ID: 550-122531-1
Project/Site: APS - Four Corners CCR

Laboratory: Eurofins TestAmerica, Phoenix

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Arizona	State Program	9	AZ0728	06-09-19 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Arizona Public Service Company
Project/Site: APS - Four Corners CCR

Job ID: 550-122531-1

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL PHX
200.7 Rev 4.4	Metals (ICP)	40CFR136A	TAL PHX
200.8 LL	Metals (ICP/MS)	EPA	TAL PHX
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PHX
SM 4500 H+ B	pH	SM	TAL PHX
200.7	Preparation, Total Metals	EPA	TAL PHX
200.8	Preparation, Total Metals	EPA	TAL PHX

Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater"

Laboratory References:

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

TestAmerica Phoenix
4645 E Cotton Ctr Blvd Bdg 3
Phoenix, AZ 85040

phone 602.437.3340 fax 623.445.6192

12253 1

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Doug Lavarnway	Site Contact: Doug Lavarnway	Date: 5/9/2019	COC No:
APS Four Corners	Tel/Fax: 928-587-0319	Lab Contact: Ken Baker	Carrier:	1 of 2 COCs
PO Box 355, MS 4915	Analysis Turnaround Time			Job No.
Fruitland, NM 87416	Calendar (C) or Work Days (W)			
Phone:	TAT if different from Below 7 Days			SDG No.
Fax:	☐ 2 weeks			
Project Name: CCR	☐ 1 week			
E-Mail Address:	☐ 2 days			
	☐ 1 day			

	Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	Perform MS / MSD (Y / N)	EPA 200.7 (B, Ca, Li)	200.8 (As, Ba, Co, Mo, Se, Tl)	EPA 300.0 (F)	SM 2540C (TDS)	SM 4500-HB (pH)	Sample Specific Notes:
1	FC-CCR-MW66-5719	5/7/2019	1039	G	W	2	N		X	X	X	X	X	
2	FC-CCR-MW67-5719	5/7/2019	1637	G	W	2	N		X	X	X	X	X	
3	FC-CCR-MW68-5719	5/7/2019	1446	G	W	2	N		X	X	X	X	X	
4	FC-CCR-MW69-5719	5/7/19	1539	G	W	2	N		X	X	X	X	X	
5	FC-CCR-MW70-5719	5/7/19	1309	G	W	2	N		X	X	X	X	X	
6	FC-CCR-MW71-5619	5/6/19	2011	G	W	2	N	X	X	X	X	X	X	
7	FC-CCR-MW72-5719	5/7/19	1403	G	W	2	N		X	X	X	X	X	
8	FC-CCR-MW73-5619	5/6/19	1918	G	W	2	N		X	X	X	X	X	
9	FC-CCR-MW83-5619	5/6/19	1819	G	W	2	N		X	X	X	X	X	
10	FC-CCR-FD01-5619	5/6/19	1819	G	W	2	N		X	X	X	X	X	

550-122531 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Special Instructions/QC Requirements & Comments:
Method 200.8 with collision cell
Radium to be analyzed by Radiation Safety

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Doug Lavarnway	APS	5/8 2134			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by: Marc St	Company: TA Phoenix	Date/Time: 5-9-19 6:45

Ice - DB 2.1°C

TestAmerica Phoenix
4645 E Cotton Ctr Blvd Bdg 3
Phoenix, AZ 85040
phone 602.437.3340 fax 623.445.6192

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

5/31/2019

Client Contact	Project Manager: Doug Lavarnway	Site Contact: Doug Lavarnway	Date: 5/9/2019	COC No:
APS Four Corners	Tel/Fax: 928-587-0319	Lab Contact: Ken Baker	Carrier:	2 of 2 COCs
PO Box 355, MS 4915	Analysis Turnaround Time			Job No.
Fruitland, NM 87416	Calendar (C) or Work Days (W)			
Phone:	TAT if different from Below 7 Days			SDG No.
Fax:	☐ 2 weeks			
Project Name: CCR	☐ 1 week			
E-Mail Address:	☐ 2 days			
	☐ 1 day			

	Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	Perform MS / MSD (Y / N)	EPA 200.7 (B, Ca, Li)	200.8 (As, Ba, Co, Mo, Se, Tl)	EPA 300.0 (F)	SM 2540C (TDS)	SM 4500-HB (pH)	Sample Specific Notes:
11	FC-CCR-MW84-5719	5/7/2019	1611	G	W	2	N		X	X	X	X	X	
12	FC-CCR-MW85-5719	5/7/2019	1719	G	W	2	N		X	X	X	X	X	
13	FC-CCR-MW86-5719	5/7/2019	954	G	W	2	N		X	X	X	X	X	
14	FC-CCR-FD02-5719	5/7/19	954	G	W	2	N		X	X	X	X	X	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* ☐ *Poison B* ☐ *Unknown*

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For _____ Months*

Special Instructions/QC Requirements & Comments:
Method 200.8 with collision cell
Radium to be analyzed by Radiation Safety

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Doug Lavarnway	APS	5/8 2132			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
			Marc Sh	TA Phoenix	5-9-19 6:45

Ice – DB 2.1°C

Login Sample Receipt Checklist

Client: Arizona Public Service Company

Job Number: 550-122531-1

Login Number: 122531
List Number: 1
Creator: Stehlin, Marc

List Source: Eurofins TestAmerica, Phoenix

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

eurofins | Environment Testing TestAmerica



ANALYTICAL REPORT

Eurofins TestAmerica, Phoenix
4625 East Cotton Ctr Blvd
Suite 189
Phoenix, AZ 85040
Tel: (602)437-3340

Laboratory Job ID: 550-122532-1
Laboratory Sample Delivery Group: Four Corners
Client Project/Site: CCR

For:
Arizona Public Service Company
4801 Cholla Lake Rd
Joseph City, Arizona 86032

Attn: Doug Lavarnway

Authorized for release by:
5/17/2019 2:03:30 PM

Ken Baker, Project Manager II
(602)659-7624
ken.baker@testamericainc.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.testamericainc.com

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

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

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Definitions/Glossary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-122532-1
SDG: Four Corners

Qualifiers

Metals

Qualifier	Qualifier Description
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated blank spike was acceptable.

General Chemistry

Qualifier	Qualifier Description
D2	Sample required dilution due to high concentration of analyte.
H5	This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.

Glossary

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

Job ID: 550-122532-1

Laboratory: Eurofins TestAmerica, Phoenix

Narrative

Job Narrative
550-122532-1

Comments
No additional comments.

Receipt
The samples were received on 5/9/2019 6:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.1º C.

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

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

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

Sample Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-122532-1
SDG: Four Corners

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
550-122532-1	FC-CCR-MW62-5719-01	Water	05/07/19 11:30	05/09/19 06:45
550-122532-2	FC-CCR-MW63-5719-02	Water	05/07/19 11:59	05/09/19 06:45
550-122532-3	FC-CCR-MW64-5719-03	Water	05/07/19 12:30	05/09/19 06:45
550-122532-4	FC-CCR-FD03-5719-04	Water	05/07/19 12:30	05/09/19 06:45
550-122532-5	FC-CCR-MW65-5719-05	Water	05/07/19 09:14	05/09/19 06:45

Detection Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-122532-1
SDG: Four Corners

Client Sample ID: FC-CCR-MW62-5719-01 — Lab Sample ID: 550-122532-1

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	1.4		0.40		mg/L	1		300.0	Total/NA
Boron	1.8		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	540	M3	2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Total Dissolved Solids	5800	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.2	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	11.1	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW63-5719-02 — Lab Sample ID: 550-122532-2

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	1.6		0.40		mg/L	1		300.0	Total/NA
Boron	1.3		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	540		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Total Dissolved Solids	4400	D2	40		mg/L	1		SM 2540C	Total/NA
pH	7.2	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	11.1	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW64-5719-03 — Lab Sample ID: 550-122532-3

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	1.4		0.40		mg/L	1		300.0	Total/NA
Boron	0.49		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	89		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Total Dissolved Solids	790		20		mg/L	1		SM 2540C	Total/NA
pH	8.0	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	11.3	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-FD03-5719-04 — Lab Sample ID: 550-122532-4

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	1.4		0.40		mg/L	1		300.0	Total/NA
Boron	0.48		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	88		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Total Dissolved Solids	780		20		mg/L	1		SM 2540C	Total/NA
pH	8.0	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	11.2	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW65-5719-05 — Lab Sample ID: 550-122532-5

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	1.7		0.40		mg/L	1		300.0	Total/NA
Boron	0.60		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	100		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Total Dissolved Solids	970		20		mg/L	1		SM 2540C	Total/NA
pH	7.9	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	11.3	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-MW62-5719-01
Lab Sample ID: 550-122532-1

Date Collected: 05/07/19 11:30
Matrix: Water
Date Received: 05/09/19 06:45

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	1.4		0.40		mg/L			05/14/19 17:40	1

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.8		0.050		mg/L		05/12/19 14:44	05/14/19 04:35	1
Calcium	540	M3	2.0		mg/L		05/12/19 14:44	05/14/19 04:35	1
Lithium	ND		0.20		mg/L		05/12/19 14:44	05/14/19 04:35	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	5800	D2	100		mg/L			05/10/19 10:48	1
pH	7.2	H5	1.7		SU			05/15/19 12:28	1
Temperature	11.1	H5	0.1		Degrees C			05/15/19 12:28	1

Client Sample ID: FC-CCR-MW63-5719-02
Lab Sample ID: 550-122532-2

Date Collected: 05/07/19 11:59
Matrix: Water
Date Received: 05/09/19 06:45

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	1.6		0.40		mg/L			05/14/19 19:30	1

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.3		0.050		mg/L		05/12/19 14:44	05/14/19 04:41	1
Calcium	540		2.0		mg/L		05/12/19 14:44	05/14/19 04:41	1
Lithium	ND		0.20		mg/L		05/12/19 14:44	05/14/19 04:41	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	4400	D2	40		mg/L			05/10/19 10:48	1
pH	7.2	H5	1.7		SU			05/15/19 12:28	1
Temperature	11.1	H5	0.1		Degrees C			05/15/19 12:28	1

Client Sample ID: FC-CCR-MW64-5719-03
Lab Sample ID: 550-122532-3

Date Collected: 05/07/19 12:30
Matrix: Water
Date Received: 05/09/19 06:45

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	1.4		0.40		mg/L			05/14/19 20:07	1

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.49		0.050		mg/L		05/12/19 14:44	05/14/19 04:47	1
Calcium	89		2.0		mg/L		05/12/19 14:44	05/14/19 04:47	1
Lithium	ND		0.20		mg/L		05/12/19 14:44	05/14/19 04:47	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	790		20		mg/L			05/10/19 10:48	1
pH	8.0	H5	1.7		SU			05/15/19 12:28	1

Client Sample ID: FC-CCR-MW64-5719-03

Lab Sample ID: 550-122532-3
Date Collected: 05/07/19 12:30
Matrix: Water
Date Received: 05/09/19 06:45

General Chemistry (Continued)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Temperature	11.3	H5	0.1		Degrees C			05/15/19 12:28	1

Client Sample ID: FC-CCR-FD03-5719-04

Lab Sample ID: 550-122532-4
Date Collected: 05/07/19 12:30
Matrix: Water
Date Received: 05/09/19 06:45

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	1.4		0.40		mg/L			05/14/19 21:21	1

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.48		0.050		mg/L		05/12/19 14:44	05/14/19 04:50	1
Calcium	88		2.0		mg/L		05/12/19 14:44	05/14/19 04:50	1
Lithium	ND		0.20		mg/L		05/12/19 14:44	05/14/19 04:50	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	780		20		mg/L			05/10/19 10:48	1
pH	8.0	H5	1.7		SU			05/15/19 12:28	1
Temperature	11.2	H5	0.1		Degrees C			05/15/19 12:28	1

Client Sample ID: FC-CCR-MW65-5719-05

Lab Sample ID: 550-122532-5
Date Collected: 05/07/19 09:14
Matrix: Water
Date Received: 05/09/19 06:45

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	1.7		0.40		mg/L			05/14/19 21:58	1

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.60		0.050		mg/L		05/12/19 14:44	05/14/19 04:53	1
Calcium	100		2.0		mg/L		05/12/19 14:44	05/14/19 04:53	1
Lithium	ND		0.20		mg/L		05/12/19 14:44	05/14/19 04:53	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	970		20		mg/L			05/13/19 10:08	1
pH	7.9	H5	1.7		SU			05/15/19 12:28	1
Temperature	11.3	H5	0.1		Degrees C			05/15/19 12:28	1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 550-177969/2
Matrix: Water
Analysis Batch: 177969

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.40		mg/L			05/14/19 16:08	1

Lab Sample ID: LCS 550-177969/5
Matrix: Water
Analysis Batch: 177969

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride			4.00	3.99		mg/L		100	90 - 110		

Lab Sample ID: LCSD 550-177969/6
Matrix: Water
Analysis Batch: 177969

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride			4.00	3.98		mg/L		99	90 - 110	0	20

Lab Sample ID: 550-122532-1 MS
Matrix: Water
Analysis Batch: 177969

Client Sample ID: FC-CCR-MW62-5719-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride	1.4		4.00	5.18		mg/L		95	80 - 120		

Lab Sample ID: 550-122532-1 MSD
Matrix: Water
Analysis Batch: 177969

Client Sample ID: FC-CCR-MW62-5719-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	1.4		4.00	5.35		mg/L		99	80 - 120	3	20

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 550-177722/1-A
Matrix: Water
Analysis Batch: 177884

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 177722

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.050		mg/L		05/12/19 14:44	05/14/19 04:15	1
Calcium	ND		2.0		mg/L		05/12/19 14:44	05/14/19 04:15	1
Lithium	ND		0.20		mg/L		05/12/19 14:44	05/14/19 04:15	1

Lab Sample ID: LCS 550-177722/2-A
Matrix: Water
Analysis Batch: 177884

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 177722

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Boron			1.00	0.998		mg/L		100	85 - 115		
Calcium			21.0	22.4		mg/L		107	85 - 115		
Lithium			1.00	0.924		mg/L		92	85 - 115		

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: LCSD 550-177722/3-A
Matrix: Water
Analysis Batch: 177884

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 177722

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron			1.00	0.984		mg/L		98	85 - 115	1	20
Calcium			21.0	22.1		mg/L		105	85 - 115	1	20
Lithium			1.00	0.925		mg/L		93	85 - 115	0	20

Lab Sample ID: 550-122532-1 MS
Matrix: Water
Analysis Batch: 177884

Client Sample ID: FC-CCR-MW62-5719-01
Prep Type: Total/NA
Prep Batch: 177722

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Boron	1.8		1.00	2.79		mg/L		99	70 - 130		
Calcium	540	M3	21.0	549	M3	mg/L		45	70 - 130		
Lithium	ND		1.00	1.04		mg/L		94	70 - 130		

Lab Sample ID: 550-122532-1 MSD
Matrix: Water
Analysis Batch: 177884

Client Sample ID: FC-CCR-MW62-5719-01
Prep Type: Total/NA
Prep Batch: 177722

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	1.8		1.00	2.74		mg/L		94	70 - 130	2	20
Calcium	540	M3	21.0	541	M3	mg/L		4	70 - 130	2	20
Lithium	ND		1.00	1.04		mg/L		94	70 - 130	0	20

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

Lab Sample ID: MB 550-177608/1
Matrix: Water
Analysis Batch: 177608

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		20		mg/L			05/10/19 10:48	1

Lab Sample ID: LCS 550-177608/2
Matrix: Water
Analysis Batch: 177608

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Dissolved Solids			1000	950		mg/L		95	90 - 110		

Lab Sample ID: LCSD 550-177608/3
Matrix: Water
Analysis Batch: 177608

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids			1000	1010		mg/L		101	90 - 110	7	10

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

Lab Sample ID: 550-122532-1 DU
Matrix: Water
Analysis Batch: 177608

Client Sample ID: FC-CCR-MW62-5719-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	5800	D2		5450	D2	mg/L				5	10

Lab Sample ID: MB 550-177750/1
Matrix: Water
Analysis Batch: 177750

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		20		mg/L			05/13/19 10:08	1

Lab Sample ID: LCS 550-177750/2
Matrix: Water
Analysis Batch: 177750

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Dissolved Solids			1000	986		mg/L		99	90 - 110		

Lab Sample ID: LCSD 550-177750/3
Matrix: Water
Analysis Batch: 177750

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids			1000	972		mg/L		97	90 - 110	1	10

Lab Sample ID: 550-122532-5 DU
Matrix: Water
Analysis Batch: 177750

Client Sample ID: FC-CCR-MW65-5719-05
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	970			960		mg/L				1	10

Method: SM 4500 H+ B - pH

Lab Sample ID: LCSSRM 550-178102/13
Matrix: Water
Analysis Batch: 178102

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

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.0		SU		100.6	98.5 - 101.5		

Lab Sample ID: LCSSRM 550-178102/24
Matrix: Water
Analysis Batch: 178102

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

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.1		SU		100.9	98.5 - 101.5		

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-122532-1
SDG: Four Corners

Method: SM 4500 H+ B - pH (Continued)

Lab Sample ID: 550-122532-1 DU
Matrix: Water
Analysis Batch: 178102

Client Sample ID: FC-CCR-MW62-5719-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	7.2	H5		7.2	H5	SU				0	5
Temperature	11.1	H5		10.9	H5	Degrees C				2	

HPLC/IC

Analysis Batch: 177969

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122532-1	FC-CCR-MW62-5719-01	Total/NA	Water	300.0	
550-122532-2	FC-CCR-MW63-5719-02	Total/NA	Water	300.0	
550-122532-3	FC-CCR-MW64-5719-03	Total/NA	Water	300.0	
550-122532-4	FC-CCR-FD03-5719-04	Total/NA	Water	300.0	
550-122532-5	FC-CCR-MW65-5719-05	Total/NA	Water	300.0	
MB 550-177969/2	Method Blank	Total/NA	Water	300.0	
LCS 550-177969/5	Lab Control Sample	Total/NA	Water	300.0	
LCSD 550-177969/6	Lab Control Sample Dup	Total/NA	Water	300.0	
550-122532-1 MS	FC-CCR-MW62-5719-01	Total/NA	Water	300.0	
550-122532-1 MSD	FC-CCR-MW62-5719-01	Total/NA	Water	300.0	

Metals

Prep Batch: 177722

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122532-1	FC-CCR-MW62-5719-01	Total/NA	Water	200.7	
550-122532-2	FC-CCR-MW63-5719-02	Total/NA	Water	200.7	
550-122532-3	FC-CCR-MW64-5719-03	Total/NA	Water	200.7	
550-122532-4	FC-CCR-FD03-5719-04	Total/NA	Water	200.7	
550-122532-5	FC-CCR-MW65-5719-05	Total/NA	Water	200.7	
MB 550-177722/1-A	Method Blank	Total/NA	Water	200.7	
LCS 550-177722/2-A	Lab Control Sample	Total/NA	Water	200.7	
LCSD 550-177722/3-A	Lab Control Sample Dup	Total/NA	Water	200.7	
550-122532-1 MS	FC-CCR-MW62-5719-01	Total/NA	Water	200.7	
550-122532-1 MSD	FC-CCR-MW62-5719-01	Total/NA	Water	200.7	

Analysis Batch: 177884

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122532-1	FC-CCR-MW62-5719-01	Total/NA	Water	200.7 Rev 4.4	177722
550-122532-2	FC-CCR-MW63-5719-02	Total/NA	Water	200.7 Rev 4.4	177722
550-122532-3	FC-CCR-MW64-5719-03	Total/NA	Water	200.7 Rev 4.4	177722
550-122532-4	FC-CCR-FD03-5719-04	Total/NA	Water	200.7 Rev 4.4	177722
550-122532-5	FC-CCR-MW65-5719-05	Total/NA	Water	200.7 Rev 4.4	177722
MB 550-177722/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	177722
LCS 550-177722/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	177722
LCSD 550-177722/3-A	Lab Control Sample Dup	Total/NA	Water	200.7 Rev 4.4	177722
550-122532-1 MS	FC-CCR-MW62-5719-01	Total/NA	Water	200.7 Rev 4.4	177722
550-122532-1 MSD	FC-CCR-MW62-5719-01	Total/NA	Water	200.7 Rev 4.4	177722

General Chemistry

Analysis Batch: 177608

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122532-1	FC-CCR-MW62-5719-01	Total/NA	Water	SM 2540C	
550-122532-2	FC-CCR-MW63-5719-02	Total/NA	Water	SM 2540C	
550-122532-3	FC-CCR-MW64-5719-03	Total/NA	Water	SM 2540C	
550-122532-4	FC-CCR-FD03-5719-04	Total/NA	Water	SM 2540C	
MB 550-177608/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 550-177608/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 550-177608/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	
550-122532-1 DU	FC-CCR-MW62-5719-01	Total/NA	Water	SM 2540C	

QC Association Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-122532-1
SDG: Four Corners

General Chemistry

Analysis Batch: 177750

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122532-5	FC-CCR-MW65-5719-05	Total/NA	Water	SM 2540C	
MB 550-177750/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 550-177750/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 550-177750/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	
550-122532-5 DU	FC-CCR-MW65-5719-05	Total/NA	Water	SM 2540C	

Analysis Batch: 178102

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122532-1	FC-CCR-MW62-5719-01	Total/NA	Water	SM 4500 H+ B	
550-122532-2	FC-CCR-MW63-5719-02	Total/NA	Water	SM 4500 H+ B	
550-122532-3	FC-CCR-MW64-5719-03	Total/NA	Water	SM 4500 H+ B	
550-122532-4	FC-CCR-FD03-5719-04	Total/NA	Water	SM 4500 H+ B	
550-122532-5	FC-CCR-MW65-5719-05	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-178102/13	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-178102/24	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
550-122532-1 DU	FC-CCR-MW62-5719-01	Total/NA	Water	SM 4500 H+ B	

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-122532-1
SDG: Four Corners

Client Sample ID: FC-CCR-MW62-5719-01
Lab Sample ID: 550-122532-1
Date Collected: 05/07/19 11:30
Matrix: Water
Date Received: 05/09/19 06:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	177969	05/14/19 17:40	NEL	TAL PHX
Total/NA	Prep	200.7			177722	05/12/19 14:44	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	177884	05/14/19 04:35	SRA	TAL PHX
Total/NA	Analysis	SM 2540C		1	177608		YET	TAL PHX
					(Start)	05/10/19 10:48		
					(End)	05/13/19 10:05		
Total/NA	Analysis	SM 4500 H+ B		1	178102	05/15/19 12:28	MRR	TAL PHX

Client Sample ID: FC-CCR-MW63-5719-02
Lab Sample ID: 550-122532-2
Date Collected: 05/07/19 11:59
Matrix: Water
Date Received: 05/09/19 06:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	177969	05/14/19 19:30	NEL	TAL PHX
Total/NA	Prep	200.7			177722	05/12/19 14:44	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	177884	05/14/19 04:41	SRA	TAL PHX
Total/NA	Analysis	SM 2540C		1	177608		YET	TAL PHX
					(Start)	05/10/19 10:48		
					(End)	05/13/19 10:05		
Total/NA	Analysis	SM 4500 H+ B		1	178102	05/15/19 12:28	MRR	TAL PHX

Client Sample ID: FC-CCR-MW64-5719-03
Lab Sample ID: 550-122532-3
Date Collected: 05/07/19 12:30
Matrix: Water
Date Received: 05/09/19 06:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	177969	05/14/19 20:07	NEL	TAL PHX
Total/NA	Prep	200.7			177722	05/12/19 14:44	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	177884	05/14/19 04:47	SRA	TAL PHX
Total/NA	Analysis	SM 2540C		1	177608		YET	TAL PHX
					(Start)	05/10/19 10:48		
					(End)	05/13/19 10:05		
Total/NA	Analysis	SM 4500 H+ B		1	178102	05/15/19 12:28	MRR	TAL PHX

Client Sample ID: FC-CCR-FD03-5719-04
Lab Sample ID: 550-122532-4
Date Collected: 05/07/19 12:30
Matrix: Water
Date Received: 05/09/19 06:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	177969	05/14/19 21:21	NEL	TAL PHX
Total/NA	Prep	200.7			177722	05/12/19 14:44	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	177884	05/14/19 04:50	SRA	TAL PHX
Total/NA	Analysis	SM 2540C		1	177608		YET	TAL PHX
					(Start)	05/10/19 10:48		
					(End)	05/13/19 10:05		

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-122532-1
SDG: Four Corners

Client Sample ID: FC-CCR-FD03-5719-04

Lab Sample ID: 550-122532-4

Date Collected: 05/07/19 12:30
Matrix: Water
Date Received: 05/09/19 06:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 4500 H+ B		1	178102	05/15/19 12:28	MRR	TAL PHX

Client Sample ID: FC-CCR-MW65-5719-05

Lab Sample ID: 550-122532-5

Date Collected: 05/07/19 09:14
Matrix: Water
Date Received: 05/09/19 06:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	177969	05/14/19 21:58	NEL	TAL PHX
Total/NA	Prep	200.7			177722	05/12/19 14:44	BCV	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	177884	05/14/19 04:53	SRA	TAL PHX
Total/NA	Analysis	SM 2540C		1	177750		YET	TAL PHX
					(Start)	05/13/19 10:08		
					(End)	05/14/19 11:00		
Total/NA	Analysis	SM 4500 H+ B		1	178102	05/15/19 12:28	MRR	TAL PHX

Laboratory References:

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

Accreditation/Certification Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-122532-1
SDG: Four Corners

Laboratory: Eurofins TestAmerica, Phoenix

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Arizona	State Program	9	AZ0728	06-09-19 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-122532-1
SDG: Four Corners

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL PHX
200.7 Rev 4.4	Metals (ICP)	40CFR136A	TAL PHX
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PHX
SM 4500 H+ B	pH	SM	TAL PHX
200.7	Preparation, Total Metals	EPA	TAL PHX

Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.
EPA = US Environmental Protection Agency
MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
SM = "Standard Methods For The Examination Of Water And Wastewater"

Laboratory References:

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

TestAmerica Phoenix
4645 E Cotton Ctr Blvd Bdg 3
Phoenix, AZ 85040
phone 602.437.3340 fax 623.445.6192

122532

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

5/17/2019

Client Contact	Project Manager: Doug Lavarnway	Site Contact: Doug Lavarnway	Date: 5/9/2019	COC No:
APS Four Corners	Tel/Fax: 928-587-0319	Lab Contact: Ken Baker	Carrier:	1 of 1 COCs
PO Box 355, MS 4915	Analysis Turnaround Time			Job No.
Fruitland, NM 87416	Calendar (C) or Work Days (W) _____			
Phone:	TAT if different from Below 7 Days			SDG No.
Fax:	☐ 2 weeks			
Project Name: CCR	☐ 1 week			
E-Mail Address:	☐ 2 days			
	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	Perform MS / MSD (Y / N)	EPA 200.7 (B, Ca, Li)	EPA 300.0 (F)	SM 2540C (TDS)	SM 4500-HB (pH)	Sample Specific Notes:
FC-CCR-MW62-5719 -01	5/7/2019	1130	G	W		N	X	X	X	X	X	
FC-CCR-MW63-5719 -02	5/7/2019	1159	G	W		N		X	X	X	X	
FC-CCR-MW64-5719 -03	5/7/2019	1230	G	W		N		X	X	X	X	
FC-CCR-FD03-5719 -04	5/7/19	1230	G	W		N		X	X	X	X	
FC-CCR-MW65-5719 -05	5/7/19	914	G	W		N		X	X	X	X	

550-122532 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Special Instructions/QC Requirements & Comments:
Method 200.8 with collision cell
Radium to be analyzed by Radiation Safety

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Doug Lavarnway	APS	5/8 2134			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
			Marc St	TA Phoenix	5-9-19 6:45

Login Sample Receipt Checklist

Client: Arizona Public Service Company

Job Number: 550-122532-1
SDG Number: Four Corners

Login Number: 122532
List Number: 1
Creator: Gravlin, Andrea

List Source: Eurofins TestAmerica, Phoenix

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

eurofins | Environment Testing TestAmerica



ANALYTICAL REPORT

Eurofins TestAmerica, Phoenix
4625 East Cotton Ctr Blvd
Suite 189
Phoenix, AZ 85040
Tel: (602)437-3340

Laboratory Job ID: 550-122988-1
Client Project/Site: APS - Four Corners CCR

For:
Arizona Public Service Company
4801 Cholla Lake Rd
Joseph City, Arizona 86032

Attn: Doug Lavarnway

Authorized for release by:
6/6/2019 2:16:49 PM

Ken Baker, Project Manager II
(602)659-7624
ken.baker@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

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

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

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Qualifiers

HPLC/IC

Qualifier	Qualifier Description
D1	Sample required dilution due to matrix.
D2	Sample required dilution due to high concentration of analyte.
D5	Minimum Reporting Limit (MRL) adjusted due to sample dilution; analyte was non-detect in the sample.
H3	Sample was received and/ or analysis requested past holding time.

Metals

Qualifier	Qualifier Description
M1	Matrix spike recovery was high, the associated blank spike recovery was acceptable.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated blank spike was acceptable.

General Chemistry

Qualifier	Qualifier Description
D2	Sample required dilution due to high concentration of analyte.
H5	This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.

Glossary

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

Job ID: 550-122988-1

Laboratory: Eurofins TestAmerica, Phoenix

Narrative

Job Narrative
550-122988-1

Comments
No additional comments.

Receipt
The samples were received on 5/16/2019 4:00 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.5º C.

HPLC/IC
Method(s) 300.0: The following samples were diluted for Fluoride by method EPA 300.0 due to the nature of the samples matrix: FC-CCR-MW7-51419 (550-122988-5), FC-CCR-MW8-51419 (550-122988-6), FC-CCR-MW87-51419 (550-122988-7), FC-CCR-MW6-51419 (550-122988-8), FC-CCR-MW38R-51419 (550-122988-9), FC-CCR-MW57-51419 (550-122988-10), FC-CCR-MW17R-51419 (550-122988-11), FC-CCR-FD02-51419 (550-122988-16) and FC-CCR-MW56-51419 (550-122988-17). These analytes were not detected in the diluted sample. As such, elevated reporting limits (RLs) have been provided and these data have been qualified with D1 and D5 flags.

Method(s) 300.0: The following samples were diluted for Fluoride by method EPA 300.0 due to the nature of the samples matrix: FC-CCR-FD01-51419 (550-122988-12), FC-CCR-MW15-51419 (550-122988-13), FC-CCR-DMX6-51419 (550-122988-14) and FC-CCR-MW16-51419 (550-122988-15). This analyte was not detected in the diluted samples. As such, elevated reporting limits (RLs) have been provided and these data have been qualified with D1 and D5 flags.

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

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

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

Sample Summary

Client: Arizona Public Service Company
Project/Site: APS - Four Corners CCR

Job ID: 550-122988-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
550-122988-1	FC-CCR-MW49A-51419	Water	05/14/19 19:12	05/16/19 16:00	
550-122988-2	FC-CCR-MW61-51319	Water	05/13/19 19:49	05/16/19 16:00	
550-122988-3	FC-CCR-MW74-51319	Water	05/13/19 18:59	05/16/19 16:00	
550-122988-4	FC-CCR-MW75-51319	Water	05/13/19 20:19	05/16/19 16:00	
550-122988-5	FC-CCR-MW7-51419	Water	05/14/19 08:49	05/16/19 16:00	
550-122988-6	FC-CCR-MW8-51419	Water	05/14/19 07:52	05/16/19 16:00	
550-122988-7	FC-CCR-MW87-51419	Water	05/14/19 12:18	05/16/19 16:00	
550-122988-8	FC-CCR-MW6-51419	Water	05/14/19 14:38	05/16/19 16:00	
550-122988-9	FC-CCR-MW38R-51419	Water	05/14/19 16:17	05/16/19 16:00	
550-122988-10	FC-CCR-MW57-51419	Water	05/14/19 14:25	05/16/19 16:00	
550-122988-11	FC-CCR-MW17R-51419	Water	05/14/19 18:01	05/16/19 16:00	
550-122988-12	FC-CCR-FD01-51419	Water	05/14/19 18:01	05/16/19 16:00	
550-122988-13	FC-CCR-MW15-51419	Water	05/14/19 10:46	05/16/19 16:00	
550-122988-14	FC-CCR-DMX6-51419	Water	05/14/19 11:28	05/16/19 16:00	
550-122988-15	FC-CCR-MW16-51419	Water	05/14/19 09:27	05/16/19 16:00	
550-122988-16	FC-CCR-FD02-51419	Water	05/14/19 09:27	05/16/19 16:00	
550-122988-17	FC-CCR-MW56-51419	Water	05/14/19 17:04	05/16/19 16:00	
550-122988-18	FC-CCR-DMX4-51419	Water	05/14/19 13:17	05/16/19 16:00	

Detection Summary

Client: Arizona Public Service Company
Project/Site: APS - Four Corners CCR

Job ID: 550-122988-1

Client Sample ID: FC-CCR-MW49A-51419 — Lab Sample ID: 550-122988-1

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	420	D2	20		mg/L	10		300.0	Total/NA
Fluoride	1.2	D1	0.80		mg/L	2		300.0	Total/NA
Sulfate	11000	D2	400		mg/L	200		300.0	Total/NA
Boron	7.4		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	350		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.71		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.00068		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.025		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00011		0.00010		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.10		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0015		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.0011		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	15000	D2	200		mg/L	1		SM 2540C	Total/NA
pH	7.6	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	9.1	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW61-51319 — Lab Sample ID: 550-122988-2

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	310	D2	200		mg/L	100		300.0	Total/NA
Fluoride	0.56		0.40		mg/L	1		300.0	Total/NA
Sulfate	3500	D2	400		mg/L	200		300.0	Total/NA
Boron	39	M3	0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	500	M3	2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.39		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.015		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.0010		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.019		0.00050		mg/L	1		200.8 LL	Total/NA
Lead	0.0012		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.089		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.00067		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00016		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	5600	D2	100		mg/L	1		SM 2540C	Total/NA
pH	8.6	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	9.3	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW74-51319 — Lab Sample ID: 550-122988-3

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	610	D2	400		mg/L	200		300.0	Total/NA
Fluoride	1.9	D1	0.80		mg/L	2		300.0	Total/NA
Sulfate	16000	D2	400		mg/L	200		300.0	Total/NA
Boron	1.6		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	400		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.73		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0044		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.016		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.017		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.14		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00017		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	23000	D2	200		mg/L	1		SM 2540C	Total/NA
pH	7.7	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Phoenix

Client Sample ID: FC-CCR-MW74-51319 (Continued) — Lab Sample ID: 550-122988-3

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Temperature	8.8	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW75-51319 — Lab Sample ID: 550-122988-4

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	300	D2	10		mg/L	5		300.0	Total/NA
Fluoride	1.2	D1	0.80		mg/L	2		300.0	Total/NA
Sulfate	4200	D2	400		mg/L	200		300.0	Total/NA
Boron	25		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	450		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.43		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.019		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.0019		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.045		0.00050		mg/L	1		200.8 LL	Total/NA
Lead	0.0030		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.18		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0023		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00018		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	6600	D2	100		mg/L	1		SM 2540C	Total/NA
pH	8.4	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	8.8	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW7-51419 — Lab Sample ID: 550-122988-5

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	570	D2	400		mg/L	200		300.0	Total/NA
Sulfate	5400	D2	400		mg/L	200		300.0	Total/NA
Boron	8.3		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	340		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.87		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.00054		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.014		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0037		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0041		0.00050		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	9200	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.4	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	9.1	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW8-51419 — Lab Sample ID: 550-122988-6

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	1100	D2	400		mg/L	200		300.0	Total/NA
Sulfate	10000	D2	400		mg/L	200		300.0	Total/NA
Boron	14		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	430		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	1.2		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.010		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.013		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0012		0.00050		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	15000	D2	200		mg/L	1		SM 2540C	Total/NA
pH	7.4	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	9.2	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Arizona Public Service Company
Project/Site: APS - Four Corners CCR

Job ID: 550-122988-1

Client Sample ID: FC-CCR-MW87-51419 — Lab Sample ID: 550-122988-7

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	2100	D2	400		mg/L	200		300.0	Total/NA
Sulfate	17000	D2	400		mg/L	200		300.0	Total/NA
Boron	1.2		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	410		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	1.3		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0026		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.015		0.00050		mg/L	1		200.8 LL	Total/NA
Cobalt	0.018		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.10		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.033		0.00050		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	29000	D2	200		mg/L	1		SM 2540C	Total/NA
pH	7.4	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	9.4	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW6-51419 — Lab Sample ID: 550-122988-8

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	1500	D2	400		mg/L	200		300.0	Total/NA
Sulfate	11000	D2	400		mg/L	200		300.0	Total/NA
Boron	5.9		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	430		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	1.3		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.016		0.00050		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0047		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0074		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.00066		0.00050		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	18000	D2	200		mg/L	1		SM 2540C	Total/NA
pH	7.3	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	10.1	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW38R-51419 — Lab Sample ID: 550-122988-9

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	300	D2	200		mg/L	100		300.0	Total/NA
Sulfate	4900	D2	400		mg/L	200		300.0	Total/NA
Boron	24		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	400		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.50		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.00060		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.017		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00013		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.16		0.00050		mg/L	1		200.8 LL	Total/NA
Lead	0.00085		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.083		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0033		0.00050		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	8200	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.7	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	8.8	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Arizona Public Service Company
Project/Site: APS - Four Corners CCR

Job ID: 550-122988-1

Client Sample ID: FC-CCR-MW57-51419 — Lab Sample ID: 550-122988-10

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	470	D2	200		mg/L	100		300.0	Total/NA
Sulfate	7300	D2	200		mg/L	100		300.0	Total/NA
Boron	1.8		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	420		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.76		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0017		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.018		0.00050		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0039		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.15		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.00054		0.00050		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	12000	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.4	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	9.3	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW17R-51419 — Lab Sample ID: 550-122988-11

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	390	D2	200		mg/L	100		300.0	Total/NA
Sulfate	4000	D2	200		mg/L	100		300.0	Total/NA
Boron	33		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	440		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.42		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.017		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.0013		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.064		0.00050		mg/L	1		200.8 LL	Total/NA
Lead	0.0022		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0014		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00022		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	6200	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.5	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	9.7	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-FD01-51419 — Lab Sample ID: 550-122988-12

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	380	D2	200		mg/L	100		300.0	Total/NA
Sulfate	3900	D2	200		mg/L	100		300.0	Total/NA
Boron	33		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	430		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.41		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.018		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.0014		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.064		0.00050		mg/L	1		200.8 LL	Total/NA
Lead	0.0022		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0013		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00022		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	6300	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.5	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	10.0	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Arizona Public Service Company
Project/Site: APS - Four Corners CCR

Job ID: 550-122988-1

Client Sample ID: FC-CCR-MW15-51419 — Lab Sample ID: 550-122988-13

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	940	D2	400		mg/L	200		300.0	Total/NA
Sulfate	6400	D2	400		mg/L	200		300.0	Total/NA
Boron	8.3		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	440		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.91		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.019		0.00050		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0022		0.00050		mg/L	1		200.8 LL	Total/NA
Lead	0.00062		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0096		0.00050		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	11000	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.0	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	11.1	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-DMX6-51419 — Lab Sample ID: 550-122988-14

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	880	D2	400		mg/L	200		300.0	Total/NA
Sulfate	8100	D2	400		mg/L	200		300.0	Total/NA
Boron	5.5		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	330		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.90		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.0097		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00011		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.00088		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.020		0.00050		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	13000	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.2	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	12.7	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW16-51419 — Lab Sample ID: 550-122988-15

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	1300	D2	400		mg/L	200		300.0	Total/NA
Sulfate	11000	D2	400		mg/L	200		300.0	Total/NA
Boron	6.6		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	410		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	1.3		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0017		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.021		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00013		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0054		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0018		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.050		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00040		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	17000	D2	200		mg/L	1		SM 2540C	Total/NA
pH	7.2	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	12.3	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-FD02-51419 — Lab Sample ID: 550-122988-16

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	1000	D2	200		mg/L	100		300.0	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-FD02-51419 (Continued) — Lab Sample ID: 550-122988-16

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Sulfate	10000	D2 H3	400		mg/L	200		300.0	Total/NA
Boron	6.6		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	410		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	1.3		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0012		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.021		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00015		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0052		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0018		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.048		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00041		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	17000	D2	200		mg/L	1		SM 2540C	Total/NA
pH	7.2	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	12.3	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW56-51419 — Lab Sample ID: 550-122988-17

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	1700	D2	200		mg/L	100		300.0	Total/NA
Sulfate	13000	D2	400		mg/L	200		300.0	Total/NA
Boron	2.7		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	440		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	1.4		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0043		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.020		0.00050		mg/L	1		200.8 LL	Total/NA
Cobalt	0.00054		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.019		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.26		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00080		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	22000	D2	200		mg/L	1		SM 2540C	Total/NA
pH	7.1	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	12.7	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-DMX4-51419 — Lab Sample ID: 550-122988-18

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	420	D2	200		mg/L	100		300.0	Total/NA
Fluoride	0.83	D1	0.80		mg/L	2		300.0	Total/NA
Sulfate	6400	D2	200		mg/L	100		300.0	Total/NA
Boron	1.2		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	410		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.65		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.0089		0.00050		mg/L	1		200.8 LL	Total/NA
Cobalt	0.00074		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0094		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.00069		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00018		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	11000	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.6	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	12.8	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-MW49A-51419

Lab Sample ID: 550-122988-1

Date Collected: 05/14/19 19:12

Matrix: Water

Date Received: 05/16/19 16:00

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	420	D2	20		mg/L			05/29/19 19:33	10
Fluoride	1.2	D1	0.80		mg/L			05/30/19 23:38	2
Sulfate	11000	D2	400		mg/L			05/29/19 19:51	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	7.4		0.050		mg/L		05/17/19 06:07	05/22/19 00:24	1
Calcium	350		2.0		mg/L		05/17/19 06:07	05/22/19 00:24	1
Lithium	0.71		0.20		mg/L		05/17/19 06:07	05/22/19 00:24	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00068		0.00050		mg/L		05/17/19 05:12	05/29/19 23:26	1
Barium	0.025		0.00050		mg/L		05/17/19 05:12	05/29/19 23:26	1
Cadmium	0.00011		0.00010		mg/L		05/17/19 05:12	05/29/19 23:26	1
Cobalt	ND		0.00050		mg/L		05/17/19 05:12	05/29/19 23:26	1
Lead	ND		0.00050		mg/L		05/17/19 05:12	05/29/19 23:26	1
Molybdenum	0.10		0.00050		mg/L		05/17/19 05:12	05/29/19 23:26	1
Selenium	0.0015		0.00050		mg/L		05/17/19 05:12	05/29/19 23:26	1
Thallium	0.0011		0.00010		mg/L		05/17/19 05:12	05/29/19 23:26	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	15000	D2	200		mg/L			05/17/19 08:38	1
pH	7.6	H5	1.7		SU			05/20/19 18:32	1
Temperature	9.1	H5	0.1		Degrees C			05/20/19 18:32	1

Client Sample ID: FC-CCR-MW61-51319

Lab Sample ID: 550-122988-2

Date Collected: 05/13/19 19:49

Matrix: Water

Date Received: 05/16/19 16:00

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	310	D2	200		mg/L			05/31/19 00:15	100
Fluoride	0.56		0.40		mg/L			05/29/19 20:10	1
Sulfate	3500	D2	400		mg/L			05/29/19 20:28	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	39	M3	0.050		mg/L		05/17/19 06:07	05/22/19 00:18	1
Calcium	500	M3	2.0		mg/L		05/17/19 06:07	05/22/19 00:18	1
Lithium	0.39		0.20		mg/L		05/17/19 06:07	05/22/19 00:18	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.00050		mg/L		05/17/19 05:12	05/29/19 23:28	1
Barium	0.015		0.00050		mg/L		05/17/19 05:12	05/29/19 23:28	1
Cadmium	0.0010		0.00010		mg/L		05/17/19 05:12	05/29/19 23:28	1
Cobalt	0.019		0.00050		mg/L		05/17/19 05:12	05/29/19 23:28	1
Lead	0.0012		0.00050		mg/L		05/17/19 05:12	05/29/19 23:28	1
Molybdenum	0.089		0.00050		mg/L		05/17/19 05:12	05/29/19 23:28	1

Client Sample ID: FC-CCR-MW61-51319

Lab Sample ID: 550-122988-2
Date Collected: 05/13/19 19:49
Matrix: Water
Date Received: 05/16/19 16:00

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Selenium	0.00067		0.00050		mg/L		05/17/19 05:12	05/29/19 23:28	1
Thallium	0.00016		0.00010		mg/L		05/17/19 05:12	05/29/19 23:28	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	5600	D2	100		mg/L			05/17/19 08:38	1
pH	8.6	H5	1.7		SU			05/20/19 18:32	1
Temperature	9.3	H5	0.1		Degrees C			05/20/19 18:32	1

Client Sample ID: FC-CCR-MW74-51319

Lab Sample ID: 550-122988-3
Date Collected: 05/13/19 18:59
Matrix: Water
Date Received: 05/16/19 16:00

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	610	D2	400		mg/L			05/29/19 21:05	200
Fluoride	1.9	D1	0.80		mg/L			05/29/19 20:46	2
Sulfate	16000	D2	400		mg/L			05/29/19 21:05	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.6		0.050		mg/L		05/17/19 06:07	05/22/19 00:30	1
Calcium	400		2.0		mg/L		05/17/19 06:07	05/22/19 00:30	1
Lithium	0.73		0.20		mg/L		05/17/19 06:07	05/22/19 00:30	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0044		0.00050		mg/L		05/17/19 05:12	05/29/19 23:30	1
Barium	0.016		0.00050		mg/L		05/17/19 05:12	05/29/19 23:30	1
Cadmium	ND		0.00010		mg/L		05/17/19 05:12	05/29/19 23:30	1
Cobalt	ND		0.00050		mg/L		05/17/19 05:12	05/29/19 23:30	1
Lead	ND		0.00050		mg/L		05/17/19 05:12	05/29/19 23:30	1
Molybdenum	0.017		0.00050		mg/L		05/17/19 05:12	05/29/19 23:30	1
Selenium	0.14		0.00050		mg/L		05/17/19 05:12	05/29/19 23:30	1
Thallium	0.00017		0.00010		mg/L		05/17/19 05:12	05/29/19 23:30	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	23000	D2	200		mg/L			05/17/19 08:38	1
pH	7.7	H5	1.7		SU			05/20/19 18:32	1
Temperature	8.8	H5	0.1		Degrees C			05/20/19 18:32	1

Client Sample ID: FC-CCR-MW75-51319

Lab Sample ID: 550-122988-4
Date Collected: 05/13/19 20:19
Matrix: Water
Date Received: 05/16/19 16:00

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	300	D2	10		mg/L			05/29/19 21:23	5
Fluoride	1.2	D1	0.80		mg/L			05/31/19 00:33	2
Sulfate	4200	D2	400		mg/L			05/29/19 21:42	200

Client Sample ID: FC-CCR-MW75-51319

Lab Sample ID: 550-122988-4

Date Collected: 05/13/19 20:19

Matrix: Water

Date Received: 05/16/19 16:00

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	**25**		0.050		mg/L		05/17/19 06:07	05/22/19 00:36	1
Calcium	**450**		2.0		mg/L		05/17/19 06:07	05/22/19 00:36	1
Lithium	**0.43**		0.20		mg/L		05/17/19 06:07	05/22/19 00:36	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.00050		mg/L		05/17/19 05:12	05/29/19 23:32	1
Barium	**0.019**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:32	1
Cadmium	**0.0019**		0.00010		mg/L		05/17/19 05:12	05/29/19 23:32	1
Cobalt	**0.045**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:32	1
Lead	**0.0030**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:32	1
Molybdenum	**0.18**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:32	1
Selenium	**0.0023**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:32	1
Thallium	**0.00018**		0.00010		mg/L		05/17/19 05:12	05/29/19 23:32	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**6600**	**D2**	100		mg/L			05/17/19 08:38	1
pH	**8.4**	**H5**	1.7		SU			05/20/19 18:32	1
Temperature	**8.8**	**H5**	0.1		Degrees C			05/20/19 18:32	1

Client Sample ID: FC-CCR-MW7-51419

Lab Sample ID: 550-122988-5

Date Collected: 05/14/19 08:49

Matrix: Water

Date Received: 05/16/19 16:00

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**570**	**D2**	400		mg/L			05/29/19 22:18	200
Fluoride	ND	D1 D5	0.80		mg/L			05/29/19 22:00	2
Sulfate	**5400**	**D2**	400		mg/L			05/29/19 22:18	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	**8.3**		0.050		mg/L		05/17/19 06:07	05/22/19 00:42	1
Calcium	**340**		2.0		mg/L		05/17/19 06:07	05/22/19 00:42	1
Lithium	**0.87**		0.20		mg/L		05/17/19 06:07	05/22/19 00:42	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.00054**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:34	1
Barium	**0.014**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:34	1
Cadmium	ND		0.00010		mg/L		05/17/19 05:12	05/29/19 23:34	1
Cobalt	ND		0.00050		mg/L		05/17/19 05:12	05/29/19 23:34	1
Lead	ND		0.00050		mg/L		05/17/19 05:12	05/29/19 23:34	1
Molybdenum	**0.0037**		0.00050		mg/L		05/17/19 05:12	05/31/19 01:33	1
Selenium	**0.0041**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:34	1
Thallium	ND		0.00010		mg/L		05/17/19 05:12	05/29/19 23:34	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**9200**	**D2**	100		mg/L			05/17/19 08:38	1

Client Sample ID: FC-CCR-MW7-51419

Lab Sample ID: 550-122988-5

Date Collected: 05/14/19 08:49
Matrix: Water
Date Received: 05/16/19 16:00

General Chemistry (Continued)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.4	H5	1.7	SU			05/20/19 18:32	1
Temperature	9.1	H5	0.1	Degrees C			05/20/19 18:32	1

Client Sample ID: FC-CCR-MW8-51419

Lab Sample ID: 550-122988-6

Date Collected: 05/14/19 07:52
Matrix: Water
Date Received: 05/16/19 16:00

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1100	D2	400	mg/L			05/29/19 23:32	200
Fluoride	ND	D1 D5	0.80	mg/L			05/29/19 23:14	2
Sulfate	10000	D2	400	mg/L			05/29/19 23:32	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	14		0.050	mg/L		05/17/19 06:07	05/22/19 00:48	1
Calcium	430		2.0	mg/L		05/17/19 06:07	05/22/19 00:48	1
Lithium	1.2		0.20	mg/L		05/17/19 06:07	05/22/19 00:48	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.00050	mg/L		05/17/19 05:12	05/29/19 23:36	1
Barium	0.010		0.00050	mg/L		05/17/19 05:12	05/29/19 23:36	1
Cadmium	ND		0.00010	mg/L		05/17/19 05:12	05/29/19 23:36	1
Cobalt	ND		0.00050	mg/L		05/17/19 05:12	05/29/19 23:36	1
Lead	ND		0.00050	mg/L		05/17/19 05:12	05/29/19 23:36	1
Molybdenum	0.013		0.00050	mg/L		05/17/19 05:12	05/29/19 23:36	1
Selenium	0.0012		0.00050	mg/L		05/17/19 05:12	05/29/19 23:36	1
Thallium	ND		0.00010	mg/L		05/17/19 05:12	05/29/19 23:36	1

General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	15000	D2	200	mg/L			05/17/19 08:38	1
pH	7.4	H5	1.7	SU			05/20/19 18:32	1
Temperature	9.2	H5	0.1	Degrees C			05/20/19 18:32	1

Client Sample ID: FC-CCR-MW87-51419

Lab Sample ID: 550-122988-7

Date Collected: 05/14/19 12:18
Matrix: Water
Date Received: 05/16/19 16:00

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2100	D2	400	mg/L			05/30/19 00:09	200
Fluoride	ND	D1 D5	0.80	mg/L			05/29/19 23:50	2
Sulfate	17000	D2	400	mg/L			05/30/19 00:09	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.2		0.050	mg/L		05/17/19 06:07	05/22/19 00:54	1
Calcium	410		2.0	mg/L		05/17/19 06:07	05/22/19 00:54	1
Lithium	1.3		0.20	mg/L		05/17/19 06:07	05/22/19 00:54	1

Client Sample ID: FC-CCR-MW87-51419

Lab Sample ID: 550-122988-7

Date Collected: 05/14/19 12:18
Matrix: Water
Date Received: 05/16/19 16:00

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.0026**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:39	1
Barium	**0.015**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:39	1
Cadmium	ND		0.00010		mg/L		05/17/19 05:12	05/29/19 23:39	1
Cobalt	**0.018**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:39	1
Lead	ND		0.00050		mg/L		05/17/19 05:12	05/29/19 23:39	1
Molybdenum	**0.10**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:39	1
Selenium	**0.033**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:39	1
Thallium	ND		0.00010		mg/L		05/17/19 05:12	05/29/19 23:39	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**29000**	**D2**	200		mg/L			05/17/19 08:38	1
pH	**7.4**	**H5**	1.7		SU			05/20/19 18:32	1
Temperature	**9.4**	**H5**	0.1		Degrees C			05/20/19 18:32	1

Client Sample ID: FC-CCR-MW6-51419

Lab Sample ID: 550-122988-8

Date Collected: 05/14/19 14:38
Matrix: Water
Date Received: 05/16/19 16:00

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1500**	**D2**	400		mg/L			05/30/19 00:46	200
Fluoride	ND	D1 D5	0.80		mg/L			05/30/19 00:27	2
Sulfate	**11000**	**D2**	400		mg/L			05/30/19 00:46	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	**5.9**		0.050		mg/L		05/17/19 06:07	05/22/19 01:00	1
Calcium	**430**		2.0		mg/L		05/17/19 06:07	05/22/19 01:00	1
Lithium	**1.3**		0.20		mg/L		05/17/19 06:07	05/22/19 01:00	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.00050		mg/L		05/17/19 05:12	05/29/19 23:45	1
Barium	**0.016**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:45	1
Cadmium	ND		0.00010		mg/L		05/17/19 05:12	05/29/19 23:45	1
Cobalt	**0.0047**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:45	1
Lead	ND		0.00050		mg/L		05/17/19 05:12	05/29/19 23:45	1
Molybdenum	**0.0074**		0.00050		mg/L		05/17/19 05:12	05/31/19 01:31	1
Selenium	**0.00066**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:45	1
Thallium	ND		0.00010		mg/L		05/17/19 05:12	05/29/19 23:45	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**18000**	**D2**	200		mg/L			05/17/19 08:38	1
pH	**7.3**	**H5**	1.7		SU			05/20/19 18:32	1
Temperature	**10.1**	**H5**	0.1		Degrees C			05/20/19 18:32	1

Client Sample ID: FC-CCR-MW38R-51419

Lab Sample ID: 550-122988-9
Date Collected: 05/14/19 16:17
Matrix: Water
Date Received: 05/16/19 16:00

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**300**	**D2**	200		mg/L			05/31/19 00:52	100
Fluoride	ND	D1 D5	0.80		mg/L			05/30/19 01:04	2
Sulfate	**4900**	**D2**	400		mg/L			05/30/19 01:22	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	**24**		0.050		mg/L		05/17/19 06:07	05/22/19 01:06	1
Calcium	**400**		2.0		mg/L		05/17/19 06:07	05/22/19 01:06	1
Lithium	**0.50**		0.20		mg/L		05/17/19 06:07	05/22/19 01:06	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.00060**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:47	1
Barium	**0.017**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:47	1
Cadmium	**0.00013**		0.00010		mg/L		05/17/19 05:12	05/29/19 23:47	1
Cobalt	**0.16**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:47	1
Lead	**0.00085**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:47	1
Molybdenum	**0.083**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:47	1
Selenium	**0.0033**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:47	1
Thallium	ND		0.00010		mg/L		05/17/19 05:12	05/29/19 23:47	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**8200**	**D2**	100		mg/L			05/17/19 08:38	1
pH	**7.7**	**H5**	1.7		SU			05/22/19 11:45	1
Temperature	**8.8**	**H5**	0.1		Degrees C			05/22/19 11:45	1

Client Sample ID: FC-CCR-MW57-51419

Lab Sample ID: 550-122988-10
Date Collected: 05/14/19 14:25
Matrix: Water
Date Received: 05/16/19 16:00

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**470**	**D2**	200		mg/L			05/30/19 14:33	100
Fluoride	ND	D1 D5	0.80		mg/L			05/30/19 14:15	2
Sulfate	**7300**	**D2**	200		mg/L			05/30/19 14:33	100

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	**1.8**		0.050		mg/L		05/17/19 06:07	05/22/19 01:18	1
Calcium	**420**		2.0		mg/L		05/17/19 06:07	05/22/19 01:18	1
Lithium	**0.76**		0.20		mg/L		05/17/19 06:07	05/22/19 01:18	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.0017**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:24	1
Barium	**0.018**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:24	1
Cadmium	ND		0.00010		mg/L		05/17/19 05:12	05/29/19 23:24	1
Cobalt	**0.0039**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:24	1
Lead	ND		0.00050		mg/L		05/17/19 05:12	05/29/19 23:24	1
Molybdenum	**0.15**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:24	1

Client Sample ID: FC-CCR-MW57-51419

Lab Sample ID: 550-122988-10
Date Collected: 05/14/19 14:25
Matrix: Water
Date Received: 05/16/19 16:00

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Selenium	**0.00054**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:24	1
Thallium	ND		0.00010		mg/L		05/17/19 05:12	05/29/19 23:24	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**12000**	**D2**	100		mg/L			05/17/19 08:38	1
pH	**7.4**	**H5**	1.7		SU			05/22/19 11:45	1
Temperature	**9.3**	**H5**	0.1		Degrees C			05/22/19 11:45	1

Client Sample ID: FC-CCR-MW17R-51419

Lab Sample ID: 550-122988-11
Date Collected: 05/14/19 18:01
Matrix: Water
Date Received: 05/16/19 16:00

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**390**	**D2**	200		mg/L			05/30/19 13:56	100
Fluoride	ND	D1 D5	0.80		mg/L			05/30/19 13:38	2
Sulfate	**4000**	**D2**	200		mg/L			05/30/19 13:56	100

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	**33**		0.050		mg/L		05/17/19 06:07	05/22/19 01:24	1
Calcium	**440**		2.0		mg/L		05/17/19 06:07	05/22/19 01:24	1
Lithium	**0.42**		0.20		mg/L		05/17/19 06:07	05/22/19 01:24	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.00050		mg/L		05/17/19 05:12	05/29/19 23:49	1
Barium	**0.017**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:49	1
Cadmium	**0.0013**		0.00010		mg/L		05/17/19 05:12	05/29/19 23:49	1
Cobalt	**0.064**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:49	1
Lead	**0.0022**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:49	1
Molybdenum	**0.0014**		0.00050		mg/L		05/17/19 05:12	05/31/19 01:36	1
Selenium	ND		0.00050		mg/L		05/17/19 05:12	05/29/19 23:49	1
Thallium	**0.00022**		0.00010		mg/L		05/17/19 05:12	05/29/19 23:49	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**6200**	**D2**	100		mg/L			05/17/19 08:38	1
pH	**7.5**	**H5**	1.7		SU			05/22/19 11:45	1
Temperature	**9.7**	**H5**	0.1		Degrees C			05/22/19 11:45	1

Client Sample ID: FC-CCR-FD01-51419

Lab Sample ID: 550-122988-12
Date Collected: 05/14/19 18:01
Matrix: Water
Date Received: 05/16/19 16:00

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**380**	**D2**	200		mg/L			05/31/19 03:00	100
Fluoride	ND	D1 D5	0.80		mg/L			05/31/19 02:42	2
Sulfate	**3900**	**D2**	200		mg/L			05/31/19 03:00	100

Client Sample ID: FC-CCR-FD01-51419

Lab Sample ID: 550-122988-12

Date Collected: 05/14/19 18:01

Matrix: Water

Date Received: 05/16/19 16:00

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	**33**		0.050		mg/L		05/17/19 06:07	05/22/19 01:30	1
Calcium	**430**		2.0		mg/L		05/17/19 06:07	05/22/19 01:30	1
Lithium	**0.41**		0.20		mg/L		05/17/19 06:07	05/22/19 01:30	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.00050		mg/L		05/17/19 05:12	05/29/19 23:51	1
Barium	**0.018**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:51	1
Cadmium	**0.0014**		0.00010		mg/L		05/17/19 05:12	05/29/19 23:51	1
Cobalt	**0.064**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:51	1
Lead	**0.0022**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:51	1
Molybdenum	**0.0013**		0.00050		mg/L		05/17/19 05:12	05/31/19 01:38	1
Selenium	ND		0.00050		mg/L		05/17/19 05:12	05/29/19 23:51	1
Thallium	**0.00022**		0.00010		mg/L		05/17/19 05:12	05/29/19 23:51	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**6300**	**D2**	100		mg/L			05/17/19 08:38	1
pH	**7.5**	**H5**	1.7		SU			05/22/19 11:45	1
Temperature	**10.0**	**H5**	0.1		Degrees C			05/22/19 11:45	1

Client Sample ID: FC-CCR-MW15-51419

Lab Sample ID: 550-122988-13

Date Collected: 05/14/19 10:46

Matrix: Water

Date Received: 05/16/19 16:00

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**940**	**D2**	400		mg/L			05/31/19 03:37	200
Fluoride	ND	D1 D5	0.80		mg/L			05/31/19 03:19	2
Sulfate	**6400**	**D2**	400		mg/L			05/31/19 03:37	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	**8.3**		0.050		mg/L		05/17/19 06:07	05/22/19 01:36	1
Calcium	**440**		2.0		mg/L		05/17/19 06:07	05/22/19 01:36	1
Lithium	**0.91**		0.20		mg/L		05/17/19 06:07	05/22/19 01:36	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.00050		mg/L		05/17/19 05:12	05/29/19 23:53	1
Barium	**0.019**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:53	1
Cadmium	ND		0.00010		mg/L		05/17/19 05:12	05/29/19 23:53	1
Cobalt	**0.0022**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:53	1
Lead	**0.00062**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:53	1
Molybdenum	**0.0096**		0.00050		mg/L		05/17/19 05:12	05/29/19 23:53	1
Selenium	ND		0.00050		mg/L		05/17/19 05:12	05/29/19 23:53	1
Thallium	ND		0.00010		mg/L		05/17/19 05:12	05/29/19 23:53	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**11000**	**D2**	100		mg/L			05/17/19 08:38	1

Client Sample ID: FC-CCR-MW15-51419

Lab Sample ID: 550-122988-13

Date Collected: 05/14/19 10:46
Matrix: Water
Date Received: 05/16/19 16:00

General Chemistry (Continued)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
pH	7.0	H5	1.7		SU			05/22/19 11:45	1
Temperature	11.1	H5	0.1		Degrees C			05/22/19 11:45	1

Client Sample ID: FC-CCR-DMX6-51419

Lab Sample ID: 550-122988-14

Date Collected: 05/14/19 11:28
Matrix: Water
Date Received: 05/16/19 16:00

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	880	D2	400		mg/L			05/31/19 04:14	200
Fluoride	ND	D1 D5	0.80		mg/L			05/31/19 03:56	2
Sulfate	8100	D2	400		mg/L			05/31/19 04:14	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	5.5		0.050		mg/L		05/17/19 06:07	05/22/19 01:42	1
Calcium	330		2.0		mg/L		05/17/19 06:07	05/22/19 01:42	1
Lithium	0.90		0.20		mg/L		05/17/19 06:07	05/22/19 01:42	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.00050		mg/L		05/17/19 05:12	05/29/19 23:55	1
Barium	0.0097		0.00050		mg/L		05/17/19 05:12	05/29/19 23:55	1
Cadmium	0.00011		0.00010		mg/L		05/17/19 05:12	05/29/19 23:55	1
Cobalt	0.00088		0.00050		mg/L		05/17/19 05:12	05/29/19 23:55	1
Lead	ND		0.00050		mg/L		05/17/19 05:12	05/29/19 23:55	1
Molybdenum	0.020		0.00050		mg/L		05/17/19 05:12	05/29/19 23:55	1
Selenium	ND		0.00050		mg/L		05/17/19 05:12	05/29/19 23:55	1
Thallium	ND		0.00010		mg/L		05/17/19 05:12	05/29/19 23:55	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	13000	D2	100		mg/L			05/17/19 08:38	1
pH	7.2	H5	1.7		SU			05/22/19 11:45	1
Temperature	12.7	H5	0.1		Degrees C			05/22/19 11:45	1

Client Sample ID: FC-CCR-MW16-51419

Lab Sample ID: 550-122988-15

Date Collected: 05/14/19 09:27
Matrix: Water
Date Received: 05/16/19 16:00

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1300	D2	400		mg/L			05/31/19 04:51	200
Fluoride	ND	D1 D5	0.80		mg/L			05/31/19 04:33	2
Sulfate	11000	D2	400		mg/L			05/31/19 04:51	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	6.6		0.050		mg/L		05/17/19 06:07	05/22/19 01:48	1
Calcium	410		2.0		mg/L		05/17/19 06:07	05/22/19 01:48	1
Lithium	1.3		0.20		mg/L		05/17/19 06:07	05/22/19 01:48	1

Client Sample ID: FC-CCR-MW16-51419

Lab Sample ID: 550-122988-15

Date Collected: 05/14/19 09:27

Matrix: Water

Date Received: 05/16/19 16:00

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0017		0.00050		mg/L		05/17/19 05:12	05/29/19 23:57	1
Barium	0.021		0.00050		mg/L		05/17/19 05:12	05/29/19 23:57	1
Cadmium	0.00013		0.00010		mg/L		05/17/19 05:12	05/29/19 23:57	1
Cobalt	0.0054		0.00050		mg/L		05/17/19 05:12	05/29/19 23:57	1
Lead	ND		0.00050		mg/L		05/17/19 05:12	05/29/19 23:57	1
Molybdenum	0.0018		0.00050		mg/L		05/17/19 05:12	05/31/19 01:40	1
Selenium	0.050		0.00050		mg/L		05/17/19 05:12	05/29/19 23:57	1
Thallium	0.00040		0.00010		mg/L		05/17/19 05:12	05/29/19 23:57	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	17000	D2	200		mg/L			05/17/19 08:38	1
pH	7.2	H5	1.7		SU			05/22/19 11:45	1
Temperature	12.3	H5	0.1		Degrees C			05/22/19 11:45	1

Client Sample ID: FC-CCR-FD02-51419

Lab Sample ID: 550-122988-16

Date Collected: 05/14/19 09:27

Matrix: Water

Date Received: 05/16/19 16:00

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1000	D2	200		mg/L			05/31/19 01:10	100
Fluoride	ND	D1 D5	0.80		mg/L			05/30/19 08:26	2
Sulfate	10000	D2 H3	400		mg/L			05/31/19 23:16	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	6.6		0.050		mg/L		05/17/19 06:07	05/22/19 01:54	1
Calcium	410		2.0		mg/L		05/17/19 06:07	05/22/19 01:54	1
Lithium	1.3		0.20		mg/L		05/17/19 06:07	05/22/19 01:54	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0012		0.00050		mg/L		05/17/19 05:12	05/29/19 23:59	1
Barium	0.021		0.00050		mg/L		05/17/19 05:12	05/29/19 23:59	1
Cadmium	0.00015		0.00010		mg/L		05/17/19 05:12	05/29/19 23:59	1
Cobalt	0.0052		0.00050		mg/L		05/17/19 05:12	05/29/19 23:59	1
Lead	ND		0.00050		mg/L		05/17/19 05:12	05/29/19 23:59	1
Molybdenum	0.0018		0.00050		mg/L		05/17/19 05:12	05/31/19 01:42	1
Selenium	0.048		0.00050		mg/L		05/17/19 05:12	05/29/19 23:59	1
Thallium	0.00041		0.00010		mg/L		05/17/19 05:12	05/29/19 23:59	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	17000	D2	200		mg/L			05/17/19 08:38	1
pH	7.2	H5	1.7		SU			05/22/19 11:45	1
Temperature	12.3	H5	0.1		Degrees C			05/22/19 11:45	1

Client Sample ID: FC-CCR-MW56-51419

Lab Sample ID: 550-122988-17

Date Collected: 05/14/19 17:04
Matrix: Water
Date Received: 05/16/19 16:00

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1700**	**D2**	200		mg/L			05/31/19 01:28	100
Fluoride	ND	D1 D5	0.80		mg/L			05/30/19 09:03	2
Sulfate	**13000**	**D2**	400		mg/L			05/31/19 23:44	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	**2.7**		0.050		mg/L		05/17/19 06:07	05/22/19 02:00	1
Calcium	**440**		2.0		mg/L		05/17/19 06:07	05/22/19 02:00	1
Lithium	**1.4**		0.20		mg/L		05/17/19 06:07	05/22/19 02:00	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.0043**		0.00050		mg/L		05/17/19 05:12	05/30/19 00:02	1
Barium	**0.020**		0.00050		mg/L		05/17/19 05:12	05/31/19 01:44	1
Cadmium	ND		0.00010		mg/L		05/17/19 05:12	05/31/19 01:44	1
Cobalt	**0.00054**		0.00050		mg/L		05/17/19 05:12	05/30/19 00:02	1
Lead	ND		0.00050		mg/L		05/17/19 05:12	05/31/19 01:44	1
Molybdenum	**0.019**		0.00050		mg/L		05/17/19 05:12	05/31/19 01:44	1
Selenium	**0.26**		0.00050		mg/L		05/17/19 05:12	05/30/19 00:02	1
Thallium	**0.00080**		0.00010		mg/L		05/17/19 05:12	05/31/19 01:44	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**22000**	**D2**	200		mg/L			05/17/19 08:38	1
pH	**7.1**	**H5**	1.7		SU			05/22/19 11:45	1
Temperature	**12.7**	**H5**	0.1		Degrees C			05/22/19 11:45	1

Client Sample ID: FC-CCR-DMX4-51419

Lab Sample ID: 550-122988-18

Date Collected: 05/14/19 13:17
Matrix: Water
Date Received: 05/16/19 16:00

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**420**	**D2**	200		mg/L			05/31/19 01:47	100
Fluoride	**0.83**	**D1**	0.80		mg/L			05/30/19 09:39	2
Sulfate	**6400**	**D2**	200		mg/L			05/31/19 01:47	100

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	**1.2**		0.050		mg/L		05/17/19 06:07	05/22/19 02:06	1
Calcium	**410**		2.0		mg/L		05/17/19 06:07	05/22/19 02:06	1
Lithium	**0.65**		0.20		mg/L		05/17/19 06:07	05/22/19 02:06	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.00050		mg/L		05/17/19 05:12	05/31/19 01:46	1
Barium	**0.0089**		0.00050		mg/L		05/17/19 05:12	05/30/19 00:04	1
Cadmium	ND		0.00010		mg/L		05/17/19 05:12	05/30/19 00:04	1
Cobalt	**0.00074**		0.00050		mg/L		05/17/19 05:12	05/31/19 01:46	1
Lead	ND		0.00050		mg/L		05/17/19 05:12	05/30/19 00:04	1
Molybdenum	**0.0094**		0.00050		mg/L		05/17/19 05:12	05/30/19 00:04	1

Client: Arizona Public Service Company
Project/Site: APS - Four Corners CCR

Job ID: 550-122988-1

Client Sample ID: FC-CCR-DMX4-51419
Date Collected: 05/14/19 13:17
Date Received: 05/16/19 16:00

Lab Sample ID: 550-122988-18
Matrix: Water

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Selenium	0.00069		0.00050		mg/L		05/17/19 05:12	05/31/19 01:46	1
Thallium	0.00018		0.00010		mg/L		05/17/19 05:12	05/30/19 00:04	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	11000	D2	100		mg/L			05/17/19 08:38	1
pH	7.6	H5	1.7		SU			05/22/19 11:45	1
Temperature	12.8	H5	0.1		Degrees C			05/22/19 11:45	1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 550-179480/2
Matrix: Water
Analysis Batch: 179480

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		2.0		mg/L			05/29/19 18:01	1
Fluoride	ND		0.40		mg/L			05/29/19 18:01	1
Sulfate	ND		2.0		mg/L			05/29/19 18:01	1

Lab Sample ID: LCS 550-179480/5
Matrix: Water
Analysis Batch: 179480

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride			20.0	20.8		mg/L		104	90 - 110		
Fluoride			4.00	4.03		mg/L		101	90 - 110		
Sulfate			20.0	20.1		mg/L		101	90 - 110		

Lab Sample ID: LCSD 550-179480/6
Matrix: Water
Analysis Batch: 179480

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride			20.0	20.9		mg/L		104	90 - 110	0	20
Fluoride			4.00	4.04		mg/L		101	90 - 110	0	20
Sulfate			20.0	20.7		mg/L		103	90 - 110	3	20

Lab Sample ID: 550-122988-10 MS
Matrix: Water
Analysis Batch: 179480

Client Sample ID: FC-CCR-MW57-51419
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride	ND		8.00	7.60	D1	mg/L		92	80 - 120		

Lab Sample ID: 550-122988-10 MS
Matrix: Water
Analysis Batch: 179480

Client Sample ID: FC-CCR-MW57-51419
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride	470	D2	2000	2570	D2	mg/L		105	80 - 120		
Sulfate	7300	D2	2000	9050	D2	mg/L		87	80 - 120		

Lab Sample ID: 550-122988-10 MSD
Matrix: Water
Analysis Batch: 179480

Client Sample ID: FC-CCR-MW57-51419
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	ND	D1 D5	8.00	7.68	D1	mg/L		93	80 - 120	1	20

Lab Sample ID: 550-122988-10 MSD
Matrix: Water
Analysis Batch: 179480

Client Sample ID: FC-CCR-MW57-51419
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	470	D2	2000	2560	D2	mg/L		105	80 - 120	0	20

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 550-122988-10 MSD
Matrix: Water
Analysis Batch: 179480

Client Sample ID: FC-CCR-MW57-51419
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	7300	D2	2000	8910	D2	mg/L		80	80 - 120	2	20

Lab Sample ID: MB 550-179611/2
Matrix: Water
Analysis Batch: 179611

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		2.0		mg/L			05/30/19 18:07	1
Fluoride	ND		0.40		mg/L			05/30/19 18:07	1
Sulfate	ND		2.0		mg/L			05/30/19 18:07	1

Lab Sample ID: LCS 550-179611/5
Matrix: Water
Analysis Batch: 179611

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride			20.0	20.8		mg/L		104	90 - 110		
Fluoride			4.00	4.10		mg/L		103	90 - 110		
Sulfate			20.0	20.1		mg/L		101	90 - 110		

Lab Sample ID: LCSD 550-179611/6
Matrix: Water
Analysis Batch: 179611

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride			20.0	20.8		mg/L		104	90 - 110	0	20
Fluoride			4.00	4.08		mg/L		102	90 - 110	1	20
Sulfate			20.0	20.2		mg/L		101	90 - 110	0	20

Lab Sample ID: 550-123354-A-9 MS
Matrix: Water
Analysis Batch: 179611

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride	11		20.0	32.9		mg/L		107	80 - 120		
Fluoride	0.66		4.00	4.75		mg/L		102	80 - 120		
Sulfate	18		20.0	38.7		mg/L		101	80 - 120		

Lab Sample ID: 550-123354-A-9 MSD
Matrix: Water
Analysis Batch: 179611

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	11		20.0	33.1		mg/L		108	80 - 120	1	20
Fluoride	0.66		4.00	4.79		mg/L		103	80 - 120	1	20
Sulfate	18		20.0	38.6		mg/L		101	80 - 120	0	20

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: MB 550-179642/2
Matrix: Water
Analysis Batch: 179642

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		2.0		mg/L			05/31/19 17:20	1
Fluoride	ND		0.40		mg/L			05/31/19 17:20	1
Sulfate	ND		2.0		mg/L			05/31/19 17:20	1

Lab Sample ID: LCS 550-179642/5
Matrix: Water
Analysis Batch: 179642

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride			20.0	20.3		mg/L		102	90 - 110		
Fluoride			4.00	4.04		mg/L		101	90 - 110		
Sulfate			20.0	19.9		mg/L		100	90 - 110		

Lab Sample ID: LCSD 550-179642/6
Matrix: Water
Analysis Batch: 179642

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride			20.0	20.3		mg/L		102	90 - 110	0	20
Fluoride			4.00	4.03		mg/L		101	90 - 110	0	20
Sulfate			20.0	20.0		mg/L		100	90 - 110	0	20

Lab Sample ID: 550-123621-C-1 MS
Matrix: Water
Analysis Batch: 179642

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride	3.8		20.0	24.8		mg/L		105	80 - 120		
Fluoride	ND		4.00	4.06		mg/L		101	80 - 120		
Sulfate	ND		20.0	21.9		mg/L		100	80 - 120		

Lab Sample ID: 550-123621-C-1 MSD
Matrix: Water
Analysis Batch: 179642

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	3.8		20.0	24.6		mg/L		104	80 - 120	1	20
Fluoride	ND		4.00	4.02		mg/L		101	80 - 120	1	20
Sulfate	ND		20.0	21.7		mg/L		99	80 - 120	1	20

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 550-178331/1-A
Matrix: Water
Analysis Batch: 178805

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 178331

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.050		mg/L		05/17/19 06:07	05/21/19 23:59	1
Calcium	ND		2.0		mg/L		05/17/19 06:07	05/21/19 23:59	1
Lithium	ND		0.20		mg/L		05/17/19 06:07	05/21/19 23:59	1

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: LCS 550-178331/2-A
Matrix: Water
Analysis Batch: 178805

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 178331

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.00	0.974		mg/L		97	85 - 115
Calcium	21.0	21.3		mg/L		101	85 - 115
Lithium	1.00	1.02		mg/L		102	85 - 115

Lab Sample ID: LCSD 550-178331/3-A
Matrix: Water
Analysis Batch: 178805

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 178331

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	1.00	0.973		mg/L		97	85 - 115	0	20
Calcium	21.0	21.3		mg/L		101	85 - 115	0	20
Lithium	1.00	1.02		mg/L		102	85 - 115	0	20

Lab Sample ID: 550-122988-2 MS
Matrix: Water
Analysis Batch: 178805

Client Sample ID: FC-CCR-MW61-51319
Prep Type: Total/NA
Prep Batch: 178331

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	39	M3	1.00	38.6	M3	mg/L		-72	70 - 130
Calcium	500	M3	21.0	501	M3	mg/L		17	70 - 130
Lithium	0.39		1.00	1.39		mg/L		100	70 - 130

Lab Sample ID: 550-122988-2 MSD
Matrix: Water
Analysis Batch: 178805

Client Sample ID: FC-CCR-MW61-51319
Prep Type: Total/NA
Prep Batch: 178331

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	39	M3	1.00	38.6	M3	mg/L		-73	70 - 130	0	20
Calcium	500	M3	21.0	502	M3	mg/L		24	70 - 130	0	20
Lithium	0.39		1.00	1.41		mg/L		101	70 - 130	1	20

Method: 200.8 LL - Metals (ICP/MS)

Lab Sample ID: MB 550-178328/1-A
Matrix: Water
Analysis Batch: 179533

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 178328

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.00050	mg/L		05/17/19 05:12	05/31/19 01:29	1
Barium	ND		0.00050	mg/L		05/17/19 05:12	05/31/19 01:29	1
Cadmium	ND		0.00010	mg/L		05/17/19 05:12	05/31/19 01:29	1
Cobalt	ND		0.00050	mg/L		05/17/19 05:12	05/31/19 01:29	1
Lead	ND		0.00050	mg/L		05/17/19 05:12	05/31/19 01:29	1
Molybdenum	ND		0.00050	mg/L		05/17/19 05:12	05/31/19 01:29	1
Selenium	ND		0.00050	mg/L		05/17/19 05:12	05/31/19 01:29	1
Thallium	ND		0.00010	mg/L		05/17/19 05:12	05/31/19 01:29	1

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 550-178328/2-A
Matrix: Water
Analysis Batch: 179495

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 178328

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	0.100	0.0983		mg/L		98	85 - 115
Barium	0.100	0.104		mg/L		104	85 - 115
Cadmium	0.100	0.0978		mg/L		98	85 - 115
Cobalt	0.100	0.0967		mg/L		97	85 - 115
Lead	0.100	0.0961		mg/L		96	85 - 115
Molybdenum	0.100	0.0992		mg/L		99	85 - 115
Selenium	0.100	0.0970		mg/L		97	85 - 115
Thallium	0.100	0.0968		mg/L		97	85 - 115

Lab Sample ID: LCSD 550-178328/3-A
Matrix: Water
Analysis Batch: 179495

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 178328

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	0.100	0.0968		mg/L		97	85 - 115	2	20
Barium	0.100	0.104		mg/L		104	85 - 115	0	20
Cadmium	0.100	0.0977		mg/L		98	85 - 115	0	20
Cobalt	0.100	0.0961		mg/L		96	85 - 115	1	20
Lead	0.100	0.0965		mg/L		96	85 - 115	0	20
Molybdenum	0.100	0.0979		mg/L		98	85 - 115	1	20
Selenium	0.100	0.0948		mg/L		95	85 - 115	2	20
Thallium	0.100	0.0971		mg/L		97	85 - 115	0	20

Lab Sample ID: 550-122988-10 MS
Matrix: Water
Analysis Batch: 179495

Client Sample ID: FC-CCR-MW57-51419
Prep Type: Total/NA
Prep Batch: 178328

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	0.0017		0.100	0.118		mg/L		116	70 - 130
Barium	0.019		0.100	0.125		mg/L		106	70 - 130
Cadmium	0.00012		0.100	0.0927		mg/L		93	70 - 130
Cobalt	0.0039		0.100	0.0999		mg/L		96	70 - 130
Lead	ND		0.100	0.0872		mg/L		87	70 - 130
Molybdenum	0.15	B1	0.100	0.262		mg/L		117	70 - 130
Selenium	ND	M1	0.100	0.146	M1	mg/L		146	70 - 130
Thallium	ND		0.100	0.0880		mg/L		88	70 - 130

Lab Sample ID: 550-122988-10 MSD
Matrix: Water
Analysis Batch: 179495

Client Sample ID: FC-CCR-MW57-51419
Prep Type: Total/NA
Prep Batch: 178328

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	0.0017		0.100	0.121		mg/L		120	70 - 130	3	20
Barium	0.019		0.100	0.127		mg/L		109	70 - 130	2	20
Cadmium	0.00012		0.100	0.0939		mg/L		94	70 - 130	1	20
Cobalt	0.0039		0.100	0.101		mg/L		98	70 - 130	2	20
Lead	ND		0.100	0.0875		mg/L		88	70 - 130	0	20
Molybdenum	0.15	B1	0.100	0.265		mg/L		119	70 - 130	1	20
Selenium	ND	M1	0.100	0.152	M1	mg/L		152	70 - 130	4	20

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Lab Sample ID: 550-122988-10 MSD — **Client Sample ID: FC-CCR-MW57-51419**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 179495 — **Prep Batch: 178328**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Thallium	ND		0.100	0.0885		mg/L		88	70 - 130	1	20

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

Lab Sample ID: MB 550-178347/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 178347

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		20		mg/L			05/17/19 08:38	1

Lab Sample ID: LCS 550-178347/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 178347

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Dissolved Solids			1000	1010		mg/L		101	90 - 110		

Lab Sample ID: LCSD 550-178347/3 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 178347

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids			1000	992		mg/L		99	90 - 110	2	10

Lab Sample ID: 550-122988-10 DU — **Client Sample ID: FC-CCR-MW57-51419**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 178347

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	12000	D2		11000	D2	mg/L				8	10

Lab Sample ID: 550-122988-11 DU — **Client Sample ID: FC-CCR-MW17R-51419**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 178347

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	6200	D2		6300	D2	mg/L				1	10

Method: SM 4500 H+ B - pH

Lab Sample ID: LCSSRM 550-178608/1 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 178608

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.0		SU		100.1	98.5 - 101.5		

Method: SM 4500 H+ B - pH (Continued)

Lab Sample ID: LCSSRM 550-178608/13
Matrix: Water
Analysis Batch: 178608

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

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.1		SU		100.9	98.5 - 101.5		

Lab Sample ID: 550-122838-A-2 DU
Matrix: Water
Analysis Batch: 178608

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	7.7	H5		7.8	H5	SU				0.8	5
Temperature	8.0	H5		8.5	H5	Degrees C				6	

Lab Sample ID: LCSSRM 550-178835/1
Matrix: Water
Analysis Batch: 178835

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

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.0		SU		99.6	98.5 - 101.5		

Lab Sample ID: LCSSRM 550-178835/12
Matrix: Water
Analysis Batch: 178835

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

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.0		SU		99.7	98.5 - 101.5		

Lab Sample ID: LCSSRM 550-178835/23
Matrix: Water
Analysis Batch: 178835

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

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.0		SU		100.6	98.5 - 101.5		

Lab Sample ID: 550-122988-10 DU
Matrix: Water
Analysis Batch: 178835

Client Sample ID: FC-CCR-MW57-51419
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	7.4	H5		7.4	H5	SU				0.1	5
Temperature	9.3	H5		9.4	H5	Degrees C				1	

Lab Sample ID: 550-123123-P-5 DU
Matrix: Water
Analysis Batch: 178835

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	8.6	H5		8.6	H5	SU				0.1	5
Temperature	14.5	H5		15.3	H5	Degrees C				5	

HPLC/IC

Analysis Batch: 179480

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122988-1	FC-CCR-MW49A-51419	Total/NA	Water	300.0	
550-122988-1	FC-CCR-MW49A-51419	Total/NA	Water	300.0	
550-122988-2	FC-CCR-MW61-51319	Total/NA	Water	300.0	
550-122988-2	FC-CCR-MW61-51319	Total/NA	Water	300.0	
550-122988-3	FC-CCR-MW74-51319	Total/NA	Water	300.0	
550-122988-3	FC-CCR-MW74-51319	Total/NA	Water	300.0	
550-122988-4	FC-CCR-MW75-51319	Total/NA	Water	300.0	
550-122988-4	FC-CCR-MW75-51319	Total/NA	Water	300.0	
550-122988-5	FC-CCR-MW7-51419	Total/NA	Water	300.0	
550-122988-5	FC-CCR-MW7-51419	Total/NA	Water	300.0	
550-122988-6	FC-CCR-MW8-51419	Total/NA	Water	300.0	
550-122988-6	FC-CCR-MW8-51419	Total/NA	Water	300.0	
550-122988-7	FC-CCR-MW87-51419	Total/NA	Water	300.0	
550-122988-7	FC-CCR-MW87-51419	Total/NA	Water	300.0	
550-122988-8	FC-CCR-MW6-51419	Total/NA	Water	300.0	
550-122988-8	FC-CCR-MW6-51419	Total/NA	Water	300.0	
550-122988-9	FC-CCR-MW38R-51419	Total/NA	Water	300.0	
550-122988-9	FC-CCR-MW38R-51419	Total/NA	Water	300.0	
550-122988-10	FC-CCR-MW57-51419	Total/NA	Water	300.0	
550-122988-10	FC-CCR-MW57-51419	Total/NA	Water	300.0	
550-122988-11	FC-CCR-MW17R-51419	Total/NA	Water	300.0	
550-122988-11	FC-CCR-MW17R-51419	Total/NA	Water	300.0	
550-122988-16	FC-CCR-FD02-51419	Total/NA	Water	300.0	
550-122988-17	FC-CCR-MW56-51419	Total/NA	Water	300.0	
550-122988-18	FC-CCR-DMX4-51419	Total/NA	Water	300.0	
MB 550-179480/2	Method Blank	Total/NA	Water	300.0	
LCS 550-179480/5	Lab Control Sample	Total/NA	Water	300.0	
LCSD 550-179480/6	Lab Control Sample Dup	Total/NA	Water	300.0	
550-122988-10 MS	FC-CCR-MW57-51419	Total/NA	Water	300.0	
550-122988-10 MS	FC-CCR-MW57-51419	Total/NA	Water	300.0	
550-122988-10 MSD	FC-CCR-MW57-51419	Total/NA	Water	300.0	
550-122988-10 MSD	FC-CCR-MW57-51419	Total/NA	Water	300.0	

Analysis Batch: 179611

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122988-1	FC-CCR-MW49A-51419	Total/NA	Water	300.0	
550-122988-2	FC-CCR-MW61-51319	Total/NA	Water	300.0	
550-122988-4	FC-CCR-MW75-51319	Total/NA	Water	300.0	
550-122988-9	FC-CCR-MW38R-51419	Total/NA	Water	300.0	
550-122988-12	FC-CCR-FD01-51419	Total/NA	Water	300.0	
550-122988-12	FC-CCR-FD01-51419	Total/NA	Water	300.0	
550-122988-13	FC-CCR-MW15-51419	Total/NA	Water	300.0	
550-122988-13	FC-CCR-MW15-51419	Total/NA	Water	300.0	
550-122988-14	FC-CCR-DMX6-51419	Total/NA	Water	300.0	
550-122988-14	FC-CCR-DMX6-51419	Total/NA	Water	300.0	
550-122988-15	FC-CCR-MW16-51419	Total/NA	Water	300.0	
550-122988-15	FC-CCR-MW16-51419	Total/NA	Water	300.0	
550-122988-16	FC-CCR-FD02-51419	Total/NA	Water	300.0	
550-122988-17	FC-CCR-MW56-51419	Total/NA	Water	300.0	
550-122988-18	FC-CCR-DMX4-51419	Total/NA	Water	300.0	
MB 550-179611/2	Method Blank	Total/NA	Water	300.0	

HPLC/IC (Continued)

Analysis Batch: 179611 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 550-179611/5	Lab Control Sample	Total/NA	Water	300.0	
LCSD 550-179611/6	Lab Control Sample Dup	Total/NA	Water	300.0	
550-123354-A-9 MS	Matrix Spike	Total/NA	Water	300.0	
550-123354-A-9 MSD	Matrix Spike Duplicate	Total/NA	Water	300.0	

Analysis Batch: 179642

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122988-16	FC-CCR-FD02-51419	Total/NA	Water	300.0	
550-122988-17	FC-CCR-MW56-51419	Total/NA	Water	300.0	
MB 550-179642/2	Method Blank	Total/NA	Water	300.0	
LCS 550-179642/5	Lab Control Sample	Total/NA	Water	300.0	
LCSD 550-179642/6	Lab Control Sample Dup	Total/NA	Water	300.0	
550-123621-C-1 MS	Matrix Spike	Total/NA	Water	300.0	
550-123621-C-1 MSD	Matrix Spike Duplicate	Total/NA	Water	300.0	

Metals

Prep Batch: 178328

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122988-1	FC-CCR-MW49A-51419	Total/NA	Water	200.8	
550-122988-2	FC-CCR-MW61-51319	Total/NA	Water	200.8	
550-122988-3	FC-CCR-MW74-51319	Total/NA	Water	200.8	
550-122988-4	FC-CCR-MW75-51319	Total/NA	Water	200.8	
550-122988-5	FC-CCR-MW7-51419	Total/NA	Water	200.8	
550-122988-6	FC-CCR-MW8-51419	Total/NA	Water	200.8	
550-122988-7	FC-CCR-MW87-51419	Total/NA	Water	200.8	
550-122988-8	FC-CCR-MW6-51419	Total/NA	Water	200.8	
550-122988-9	FC-CCR-MW38R-51419	Total/NA	Water	200.8	
550-122988-10	FC-CCR-MW57-51419	Total/NA	Water	200.8	
550-122988-11	FC-CCR-MW17R-51419	Total/NA	Water	200.8	
550-122988-12	FC-CCR-FD01-51419	Total/NA	Water	200.8	
550-122988-13	FC-CCR-MW15-51419	Total/NA	Water	200.8	
550-122988-14	FC-CCR-DMX6-51419	Total/NA	Water	200.8	
550-122988-15	FC-CCR-MW16-51419	Total/NA	Water	200.8	
550-122988-16	FC-CCR-FD02-51419	Total/NA	Water	200.8	
550-122988-17	FC-CCR-MW56-51419	Total/NA	Water	200.8	
550-122988-18	FC-CCR-DMX4-51419	Total/NA	Water	200.8	
MB 550-178328/1-A	Method Blank	Total/NA	Water	200.8	
LCS 550-178328/2-A	Lab Control Sample	Total/NA	Water	200.8	
LCSD 550-178328/3-A	Lab Control Sample Dup	Total/NA	Water	200.8	
550-122988-10 MS	FC-CCR-MW57-51419	Total/NA	Water	200.8	
550-122988-10 MSD	FC-CCR-MW57-51419	Total/NA	Water	200.8	

Prep Batch: 178331

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122988-1	FC-CCR-MW49A-51419	Total/NA	Water	200.7	
550-122988-2	FC-CCR-MW61-51319	Total/NA	Water	200.7	
550-122988-3	FC-CCR-MW74-51319	Total/NA	Water	200.7	
550-122988-4	FC-CCR-MW75-51319	Total/NA	Water	200.7	
550-122988-5	FC-CCR-MW7-51419	Total/NA	Water	200.7	
550-122988-6	FC-CCR-MW8-51419	Total/NA	Water	200.7	

Metals (Continued)

Prep Batch: 178331 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122988-7	FC-CCR-MW87-51419	Total/NA	Water	200.7	
550-122988-8	FC-CCR-MW6-51419	Total/NA	Water	200.7	
550-122988-9	FC-CCR-MW38R-51419	Total/NA	Water	200.7	
550-122988-10	FC-CCR-MW57-51419	Total/NA	Water	200.7	
550-122988-11	FC-CCR-MW17R-51419	Total/NA	Water	200.7	
550-122988-12	FC-CCR-FD01-51419	Total/NA	Water	200.7	
550-122988-13	FC-CCR-MW15-51419	Total/NA	Water	200.7	
550-122988-14	FC-CCR-DMX6-51419	Total/NA	Water	200.7	
550-122988-15	FC-CCR-MW16-51419	Total/NA	Water	200.7	
550-122988-16	FC-CCR-FD02-51419	Total/NA	Water	200.7	
550-122988-17	FC-CCR-MW56-51419	Total/NA	Water	200.7	
550-122988-18	FC-CCR-DMX4-51419	Total/NA	Water	200.7	
MB 550-178331/1-A	Method Blank	Total/NA	Water	200.7	
LCS 550-178331/2-A	Lab Control Sample	Total/NA	Water	200.7	
LCSD 550-178331/3-A	Lab Control Sample Dup	Total/NA	Water	200.7	
550-122988-2 MS	FC-CCR-MW61-51319	Total/NA	Water	200.7	
550-122988-2 MSD	FC-CCR-MW61-51319	Total/NA	Water	200.7	

Analysis Batch: 178805

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122988-1	FC-CCR-MW49A-51419	Total/NA	Water	200.7 Rev 4.4	178331
550-122988-2	FC-CCR-MW61-51319	Total/NA	Water	200.7 Rev 4.4	178331
550-122988-3	FC-CCR-MW74-51319	Total/NA	Water	200.7 Rev 4.4	178331
550-122988-4	FC-CCR-MW75-51319	Total/NA	Water	200.7 Rev 4.4	178331
550-122988-5	FC-CCR-MW7-51419	Total/NA	Water	200.7 Rev 4.4	178331
550-122988-6	FC-CCR-MW8-51419	Total/NA	Water	200.7 Rev 4.4	178331
550-122988-7	FC-CCR-MW87-51419	Total/NA	Water	200.7 Rev 4.4	178331
550-122988-8	FC-CCR-MW6-51419	Total/NA	Water	200.7 Rev 4.4	178331
550-122988-9	FC-CCR-MW38R-51419	Total/NA	Water	200.7 Rev 4.4	178331
550-122988-10	FC-CCR-MW57-51419	Total/NA	Water	200.7 Rev 4.4	178331
550-122988-11	FC-CCR-MW17R-51419	Total/NA	Water	200.7 Rev 4.4	178331
550-122988-12	FC-CCR-FD01-51419	Total/NA	Water	200.7 Rev 4.4	178331
550-122988-13	FC-CCR-MW15-51419	Total/NA	Water	200.7 Rev 4.4	178331
550-122988-14	FC-CCR-DMX6-51419	Total/NA	Water	200.7 Rev 4.4	178331
550-122988-15	FC-CCR-MW16-51419	Total/NA	Water	200.7 Rev 4.4	178331
550-122988-16	FC-CCR-FD02-51419	Total/NA	Water	200.7 Rev 4.4	178331
550-122988-17	FC-CCR-MW56-51419	Total/NA	Water	200.7 Rev 4.4	178331
550-122988-18	FC-CCR-DMX4-51419	Total/NA	Water	200.7 Rev 4.4	178331
MB 550-178331/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	178331
LCS 550-178331/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	178331
LCSD 550-178331/3-A	Lab Control Sample Dup	Total/NA	Water	200.7 Rev 4.4	178331
550-122988-2 MS	FC-CCR-MW61-51319	Total/NA	Water	200.7 Rev 4.4	178331
550-122988-2 MSD	FC-CCR-MW61-51319	Total/NA	Water	200.7 Rev 4.4	178331

Analysis Batch: 179495

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122988-1	FC-CCR-MW49A-51419	Total/NA	Water	200.8 LL	178328
550-122988-2	FC-CCR-MW61-51319	Total/NA	Water	200.8 LL	178328
550-122988-3	FC-CCR-MW74-51319	Total/NA	Water	200.8 LL	178328
550-122988-4	FC-CCR-MW75-51319	Total/NA	Water	200.8 LL	178328
550-122988-5	FC-CCR-MW7-51419	Total/NA	Water	200.8 LL	178328

Metals (Continued)

Analysis Batch: 179495 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122988-6	FC-CCR-MW8-51419	Total/NA	Water	200.8 LL	178328
550-122988-7	FC-CCR-MW87-51419	Total/NA	Water	200.8 LL	178328
550-122988-8	FC-CCR-MW6-51419	Total/NA	Water	200.8 LL	178328
550-122988-9	FC-CCR-MW38R-51419	Total/NA	Water	200.8 LL	178328
550-122988-10	FC-CCR-MW57-51419	Total/NA	Water	200.8 LL	178328
550-122988-11	FC-CCR-MW17R-51419	Total/NA	Water	200.8 LL	178328
550-122988-12	FC-CCR-FD01-51419	Total/NA	Water	200.8 LL	178328
550-122988-13	FC-CCR-MW15-51419	Total/NA	Water	200.8 LL	178328
550-122988-14	FC-CCR-DMX6-51419	Total/NA	Water	200.8 LL	178328
550-122988-15	FC-CCR-MW16-51419	Total/NA	Water	200.8 LL	178328
550-122988-16	FC-CCR-FD02-51419	Total/NA	Water	200.8 LL	178328
550-122988-17	FC-CCR-MW56-51419	Total/NA	Water	200.8 LL	178328
550-122988-18	FC-CCR-DMX4-51419	Total/NA	Water	200.8 LL	178328
LCS 550-178328/2-A	Lab Control Sample	Total/NA	Water	200.8 LL	178328
LCSD 550-178328/3-A	Lab Control Sample Dup	Total/NA	Water	200.8 LL	178328
550-122988-10 MS	FC-CCR-MW57-51419	Total/NA	Water	200.8 LL	178328
550-122988-10 MSD	FC-CCR-MW57-51419	Total/NA	Water	200.8 LL	178328

Analysis Batch: 179533

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122988-5	FC-CCR-MW7-51419	Total/NA	Water	200.8 LL	178328
550-122988-8	FC-CCR-MW6-51419	Total/NA	Water	200.8 LL	178328
550-122988-11	FC-CCR-MW17R-51419	Total/NA	Water	200.8 LL	178328
550-122988-12	FC-CCR-FD01-51419	Total/NA	Water	200.8 LL	178328
550-122988-15	FC-CCR-MW16-51419	Total/NA	Water	200.8 LL	178328
550-122988-16	FC-CCR-FD02-51419	Total/NA	Water	200.8 LL	178328
550-122988-17	FC-CCR-MW56-51419	Total/NA	Water	200.8 LL	178328
550-122988-18	FC-CCR-DMX4-51419	Total/NA	Water	200.8 LL	178328
MB 550-178328/1-A	Method Blank	Total/NA	Water	200.8 LL	178328

General Chemistry

Analysis Batch: 178347

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122988-1	FC-CCR-MW49A-51419	Total/NA	Water	SM 2540C	
550-122988-2	FC-CCR-MW61-51319	Total/NA	Water	SM 2540C	
550-122988-3	FC-CCR-MW74-51319	Total/NA	Water	SM 2540C	
550-122988-4	FC-CCR-MW75-51319	Total/NA	Water	SM 2540C	
550-122988-5	FC-CCR-MW7-51419	Total/NA	Water	SM 2540C	
550-122988-6	FC-CCR-MW8-51419	Total/NA	Water	SM 2540C	
550-122988-7	FC-CCR-MW87-51419	Total/NA	Water	SM 2540C	
550-122988-8	FC-CCR-MW6-51419	Total/NA	Water	SM 2540C	
550-122988-9	FC-CCR-MW38R-51419	Total/NA	Water	SM 2540C	
550-122988-10	FC-CCR-MW57-51419	Total/NA	Water	SM 2540C	
550-122988-11	FC-CCR-MW17R-51419	Total/NA	Water	SM 2540C	
550-122988-12	FC-CCR-FD01-51419	Total/NA	Water	SM 2540C	
550-122988-13	FC-CCR-MW15-51419	Total/NA	Water	SM 2540C	
550-122988-14	FC-CCR-DMX6-51419	Total/NA	Water	SM 2540C	
550-122988-15	FC-CCR-MW16-51419	Total/NA	Water	SM 2540C	
550-122988-16	FC-CCR-FD02-51419	Total/NA	Water	SM 2540C	
550-122988-17	FC-CCR-MW56-51419	Total/NA	Water	SM 2540C	

General Chemistry (Continued)

Analysis Batch: 178347 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122988-18	FC-CCR-DMX4-51419	Total/NA	Water	SM 2540C	
MB 550-178347/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 550-178347/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 550-178347/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	
550-122988-10 DU	FC-CCR-MW57-51419	Total/NA	Water	SM 2540C	
550-122988-11 DU	FC-CCR-MW17R-51419	Total/NA	Water	SM 2540C	

Analysis Batch: 178608

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122988-1	FC-CCR-MW49A-51419	Total/NA	Water	SM 4500 H+ B	
550-122988-2	FC-CCR-MW61-51319	Total/NA	Water	SM 4500 H+ B	
550-122988-3	FC-CCR-MW74-51319	Total/NA	Water	SM 4500 H+ B	
550-122988-4	FC-CCR-MW75-51319	Total/NA	Water	SM 4500 H+ B	
550-122988-5	FC-CCR-MW7-51419	Total/NA	Water	SM 4500 H+ B	
550-122988-6	FC-CCR-MW8-51419	Total/NA	Water	SM 4500 H+ B	
550-122988-7	FC-CCR-MW87-51419	Total/NA	Water	SM 4500 H+ B	
550-122988-8	FC-CCR-MW6-51419	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-178608/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-178608/13	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
550-122838-A-2 DU	Duplicate	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 178835

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-122988-9	FC-CCR-MW38R-51419	Total/NA	Water	SM 4500 H+ B	
550-122988-10	FC-CCR-MW57-51419	Total/NA	Water	SM 4500 H+ B	
550-122988-11	FC-CCR-MW17R-51419	Total/NA	Water	SM 4500 H+ B	
550-122988-12	FC-CCR-FD01-51419	Total/NA	Water	SM 4500 H+ B	
550-122988-13	FC-CCR-MW15-51419	Total/NA	Water	SM 4500 H+ B	
550-122988-14	FC-CCR-DMX6-51419	Total/NA	Water	SM 4500 H+ B	
550-122988-15	FC-CCR-MW16-51419	Total/NA	Water	SM 4500 H+ B	
550-122988-16	FC-CCR-FD02-51419	Total/NA	Water	SM 4500 H+ B	
550-122988-17	FC-CCR-MW56-51419	Total/NA	Water	SM 4500 H+ B	
550-122988-18	FC-CCR-DMX4-51419	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-178835/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-178835/12	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-178835/23	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
550-122988-10 DU	FC-CCR-MW57-51419	Total/NA	Water	SM 4500 H+ B	
550-123123-P-5 DU	Duplicate	Total/NA	Water	SM 4500 H+ B	

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: APS - Four Corners CCR

Job ID: 550-122988-1

Client Sample ID: FC-CCR-MW49A-51419

Lab Sample ID: 550-122988-1
Matrix: Water
Date Collected: 05/14/19 19:12
Date Received: 05/16/19 16:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		10	179480	05/29/19 19:33	NEL	TAL PHX
Total/NA	Analysis	300.0		200	179480	05/29/19 19:51	NEL	TAL PHX
Total/NA	Analysis	300.0		2	179611	05/30/19 23:38	KJS	TAL PHX
Total/NA	Prep	200.7			178331	05/17/19 06:07	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178805	05/22/19 00:24	SRA	TAL PHX
Total/NA	Prep	200.8			178328	05/17/19 05:12	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179495	05/29/19 23:26	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	178347		YET	TAL PHX
						(Start) 05/17/19 08:38		
						(End) 05/20/19 10:10		
Total/NA	Analysis	SM 4500 H+ B		1	178608	05/20/19 18:32	MRR	TAL PHX

Client Sample ID: FC-CCR-MW61-51319

Lab Sample ID: 550-122988-2
Matrix: Water
Date Collected: 05/13/19 19:49
Date Received: 05/16/19 16:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	179480	05/29/19 20:10	NEL	TAL PHX
Total/NA	Analysis	300.0		200	179480	05/29/19 20:28	NEL	TAL PHX
Total/NA	Analysis	300.0		100	179611	05/31/19 00:15	KJS	TAL PHX
Total/NA	Prep	200.7			178331	05/17/19 06:07	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178805	05/22/19 00:18	SRA	TAL PHX
Total/NA	Prep	200.8			178328	05/17/19 05:12	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179495	05/29/19 23:28	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	178347		YET	TAL PHX
						(Start) 05/17/19 08:38		
						(End) 05/20/19 10:10		
Total/NA	Analysis	SM 4500 H+ B		1	178608	05/20/19 18:32	MRR	TAL PHX

Client Sample ID: FC-CCR-MW74-51319

Lab Sample ID: 550-122988-3
Matrix: Water
Date Collected: 05/13/19 18:59
Date Received: 05/16/19 16:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	179480	05/29/19 20:46	NEL	TAL PHX
Total/NA	Analysis	300.0		200	179480	05/29/19 21:05	NEL	TAL PHX
Total/NA	Prep	200.7			178331	05/17/19 06:07	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178805	05/22/19 00:30	SRA	TAL PHX
Total/NA	Prep	200.8			178328	05/17/19 05:12	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179495	05/29/19 23:30	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	178347		YET	TAL PHX
						(Start) 05/17/19 08:38		
						(End) 05/20/19 10:10		
Total/NA	Analysis	SM 4500 H+ B		1	178608	05/20/19 18:32	MRR	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: APS - Four Corners CCR

Job ID: 550-122988-1

Client Sample ID: FC-CCR-MW75-51319

Lab Sample ID: 550-122988-4

Date Collected: 05/13/19 20:19
Date Received: 05/16/19 16:00

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		5	179480	05/29/19 21:23	NEL	TAL PHX
Total/NA	Analysis	300.0		200	179480	05/29/19 21:42	NEL	TAL PHX
Total/NA	Analysis	300.0		2	179611	05/31/19 00:33	KJS	TAL PHX
Total/NA	Prep	200.7			178331	05/17/19 06:07	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178805	05/22/19 00:36	SRA	TAL PHX
Total/NA	Prep	200.8			178328	05/17/19 05:12	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179495	05/29/19 23:32	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	178347		YET	TAL PHX
					(Start)	05/17/19 08:38		
					(End)	05/20/19 10:10		
Total/NA	Analysis	SM 4500 H+ B		1	178608	05/20/19 18:32	MRR	TAL PHX

Client Sample ID: FC-CCR-MW7-51419

Lab Sample ID: 550-122988-5

Date Collected: 05/14/19 08:49
Date Received: 05/16/19 16:00

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	179480	05/29/19 22:00	NEL	TAL PHX
Total/NA	Analysis	300.0		200	179480	05/29/19 22:18	NEL	TAL PHX
Total/NA	Prep	200.7			178331	05/17/19 06:07	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178805	05/22/19 00:42	SRA	TAL PHX
Total/NA	Prep	200.8			178328	05/17/19 05:12	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179495	05/29/19 23:34	ARE	TAL PHX
Total/NA	Prep	200.8			178328	05/17/19 05:12	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179533	05/31/19 01:33	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	178347		YET	TAL PHX
					(Start)	05/17/19 08:38		
					(End)	05/20/19 10:10		
Total/NA	Analysis	SM 4500 H+ B		1	178608	05/20/19 18:32	MRR	TAL PHX

Client Sample ID: FC-CCR-MW8-51419

Lab Sample ID: 550-122988-6

Date Collected: 05/14/19 07:52
Date Received: 05/16/19 16:00

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	179480	05/29/19 23:14	NEL	TAL PHX
Total/NA	Analysis	300.0		200	179480	05/29/19 23:32	NEL	TAL PHX
Total/NA	Prep	200.7			178331	05/17/19 06:07	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178805	05/22/19 00:48	SRA	TAL PHX
Total/NA	Prep	200.8			178328	05/17/19 05:12	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179495	05/29/19 23:36	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	178347		YET	TAL PHX
					(Start)	05/17/19 08:38		
					(End)	05/20/19 10:10		

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: APS - Four Corners CCR

Job ID: 550-122988-1

Client Sample ID: FC-CCR-MW8-51419
Date Collected: 05/14/19 07:52
Date Received: 05/16/19 16:00

Lab Sample ID: 550-122988-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 4500 H+ B		1	178608	05/20/19 18:32	MRR	TAL PHX

Client Sample ID: FC-CCR-MW87-51419
Date Collected: 05/14/19 12:18
Date Received: 05/16/19 16:00

Lab Sample ID: 550-122988-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	179480	05/29/19 23:50	NEL	TAL PHX
Total/NA	Analysis	300.0		200	179480	05/30/19 00:09	NEL	TAL PHX
Total/NA	Prep	200.7			178331	05/17/19 06:07	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178805	05/22/19 00:54	SRA	TAL PHX
Total/NA	Prep	200.8			178328	05/17/19 05:12	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179495	05/29/19 23:39	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	178347		YET	TAL PHX
					(Start)	05/17/19 08:38		
					(End)	05/20/19 10:10		
Total/NA	Analysis	SM 4500 H+ B		1	178608	05/20/19 18:32	MRR	TAL PHX

Client Sample ID: FC-CCR-MW6-51419
Date Collected: 05/14/19 14:38
Date Received: 05/16/19 16:00

Lab Sample ID: 550-122988-8
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	179480	05/30/19 00:27	NEL	TAL PHX
Total/NA	Analysis	300.0		200	179480	05/30/19 00:46	NEL	TAL PHX
Total/NA	Prep	200.7			178331	05/17/19 06:07	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178805	05/22/19 01:00	SRA	TAL PHX
Total/NA	Prep	200.8			178328	05/17/19 05:12	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179495	05/29/19 23:45	ARE	TAL PHX
Total/NA	Prep	200.8			178328	05/17/19 05:12	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179533	05/31/19 01:31	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	178347		YET	TAL PHX
					(Start)	05/17/19 08:38		
					(End)	05/20/19 10:10		
Total/NA	Analysis	SM 4500 H+ B		1	178608	05/20/19 18:32	MRR	TAL PHX

Client Sample ID: FC-CCR-MW38R-51419
Date Collected: 05/14/19 16:17
Date Received: 05/16/19 16:00

Lab Sample ID: 550-122988-9
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	179480	05/30/19 01:04	NEL	TAL PHX
Total/NA	Analysis	300.0		200	179480	05/30/19 01:22	NEL	TAL PHX
Total/NA	Analysis	300.0		100	179611	05/31/19 00:52	KJS	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: APS - Four Corners CCR

Job ID: 550-122988-1

Client Sample ID: FC-CCR-MW38R-51419

Lab Sample ID: 550-122988-9

Date Collected: 05/14/19 16:17
Date Received: 05/16/19 16:00

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			178331	05/17/19 06:07	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178805	05/22/19 01:06	SRA	TAL PHX
Total/NA	Prep	200.8			178328	05/17/19 05:12	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179495	05/29/19 23:47	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	178347		YET	TAL PHX
					(Start)	05/17/19 08:38		
					(End)	05/20/19 10:10		
Total/NA	Analysis	SM 4500 H+ B		1	178835	05/22/19 11:45	MRR	TAL PHX

Client Sample ID: FC-CCR-MW57-51419

Lab Sample ID: 550-122988-10

Date Collected: 05/14/19 14:25
Date Received: 05/16/19 16:00

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	179480	05/30/19 14:15	NEL	TAL PHX
Total/NA	Analysis	300.0		100	179480	05/30/19 14:33	NEL	TAL PHX
Total/NA	Prep	200.7			178331	05/17/19 06:07	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178805	05/22/19 01:18	SRA	TAL PHX
Total/NA	Prep	200.8			178328	05/17/19 05:12	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179495	05/29/19 23:24	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	178347		YET	TAL PHX
					(Start)	05/17/19 08:38		
					(End)	05/20/19 10:10		
Total/NA	Analysis	SM 4500 H+ B		1	178835	05/22/19 11:45	MRR	TAL PHX

Client Sample ID: FC-CCR-MW17R-51419

Lab Sample ID: 550-122988-11

Date Collected: 05/14/19 18:01
Date Received: 05/16/19 16:00

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	179480	05/30/19 13:38	NEL	TAL PHX
Total/NA	Analysis	300.0		100	179480	05/30/19 13:56	NEL	TAL PHX
Total/NA	Prep	200.7			178331	05/17/19 06:07	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178805	05/22/19 01:24	SRA	TAL PHX
Total/NA	Prep	200.8			178328	05/17/19 05:12	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179495	05/29/19 23:49	ARE	TAL PHX
Total/NA	Prep	200.8			178328	05/17/19 05:12	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179533	05/31/19 01:36	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	178347		YET	TAL PHX
					(Start)	05/17/19 08:38		
					(End)	05/20/19 10:10		
Total/NA	Analysis	SM 4500 H+ B		1	178835	05/22/19 11:45	MRR	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: APS - Four Corners CCR

Job ID: 550-122988-1

Client Sample ID: FC-CCR-FD01-51419

Lab Sample ID: 550-122988-12

Date Collected: 05/14/19 18:01
Matrix: Water
Date Received: 05/16/19 16:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	179611	05/31/19 02:42	KJS	TAL PHX
Total/NA	Analysis	300.0		100	179611	05/31/19 03:00	KJS	TAL PHX
Total/NA	Prep	200.7			178331	05/17/19 06:07	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178805	05/22/19 01:30	SRA	TAL PHX
Total/NA	Prep	200.8			178328	05/17/19 05:12	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179495	05/29/19 23:51	ARE	TAL PHX
Total/NA	Prep	200.8			178328	05/17/19 05:12	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179533	05/31/19 01:38	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	178347		YET	TAL PHX
						(Start) 05/17/19 08:38		
						(End) 05/20/19 10:10		
Total/NA	Analysis	SM 4500 H+ B		1	178835	05/22/19 11:45	MRR	TAL PHX

Client Sample ID: FC-CCR-MW15-51419

Lab Sample ID: 550-122988-13

Date Collected: 05/14/19 10:46
Matrix: Water
Date Received: 05/16/19 16:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	179611	05/31/19 03:19	KJS	TAL PHX
Total/NA	Analysis	300.0		200	179611	05/31/19 03:37	KJS	TAL PHX
Total/NA	Prep	200.7			178331	05/17/19 06:07	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178805	05/22/19 01:36	SRA	TAL PHX
Total/NA	Prep	200.8			178328	05/17/19 05:12	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179495	05/29/19 23:53	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	178347		YET	TAL PHX
						(Start) 05/17/19 08:38		
						(End) 05/20/19 10:10		
Total/NA	Analysis	SM 4500 H+ B		1	178835	05/22/19 11:45	MRR	TAL PHX

Client Sample ID: FC-CCR-DMX6-51419

Lab Sample ID: 550-122988-14

Date Collected: 05/14/19 11:28
Matrix: Water
Date Received: 05/16/19 16:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	179611	05/31/19 03:56	KJS	TAL PHX
Total/NA	Analysis	300.0		200	179611	05/31/19 04:14	KJS	TAL PHX
Total/NA	Prep	200.7			178331	05/17/19 06:07	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178805	05/22/19 01:42	SRA	TAL PHX
Total/NA	Prep	200.8			178328	05/17/19 05:12	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179495	05/29/19 23:55	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	178347		YET	TAL PHX
						(Start) 05/17/19 08:38		
						(End) 05/20/19 10:10		
Total/NA	Analysis	SM 4500 H+ B		1	178835	05/22/19 11:45	MRR	TAL PHX

Client Sample ID: FC-CCR-MW16-51419

Lab Sample ID: 550-122988-15

Date Collected: 05/14/19 09:27

Matrix: Water

Date Received: 05/16/19 16:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	179611	05/31/19 04:33	KJS	TAL PHX
Total/NA	Analysis	300.0		200	179611	05/31/19 04:51	KJS	TAL PHX
Total/NA	Prep	200.7			178331	05/17/19 06:07	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178805	05/22/19 01:48	SRA	TAL PHX
Total/NA	Prep	200.8			178328	05/17/19 05:12	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179495	05/29/19 23:57	ARE	TAL PHX
Total/NA	Prep	200.8			178328	05/17/19 05:12	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179533	05/31/19 01:40	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	178347		YET	TAL PHX
						(Start) 05/17/19 08:38		
						(End) 05/20/19 10:10		
Total/NA	Analysis	SM 4500 H+ B		1	178835	05/22/19 11:45	MRR	TAL PHX

Client Sample ID: FC-CCR-FD02-51419

Lab Sample ID: 550-122988-16

Date Collected: 05/14/19 09:27

Matrix: Water

Date Received: 05/16/19 16:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	179480	05/30/19 08:26	NEL	TAL PHX
Total/NA	Analysis	300.0		100	179611	05/31/19 01:10	KJS	TAL PHX
Total/NA	Analysis	300.0		200	179642	05/31/19 23:16	KJS	TAL PHX
Total/NA	Prep	200.7			178331	05/17/19 06:07	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178805	05/22/19 01:54	SRA	TAL PHX
Total/NA	Prep	200.8			178328	05/17/19 05:12	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179495	05/29/19 23:59	ARE	TAL PHX
Total/NA	Prep	200.8			178328	05/17/19 05:12	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179533	05/31/19 01:42	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	178347		YET	TAL PHX
						(Start) 05/17/19 08:38		
						(End) 05/20/19 10:10		
Total/NA	Analysis	SM 4500 H+ B		1	178835	05/22/19 11:45	MRR	TAL PHX

Client Sample ID: FC-CCR-MW56-51419

Lab Sample ID: 550-122988-17

Date Collected: 05/14/19 17:04

Matrix: Water

Date Received: 05/16/19 16:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	179480	05/30/19 09:03	NEL	TAL PHX
Total/NA	Analysis	300.0		100	179611	05/31/19 01:28	KJS	TAL PHX
Total/NA	Analysis	300.0		200	179642	05/31/19 23:44	KJS	TAL PHX
Total/NA	Prep	200.7			178331	05/17/19 06:07	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178805	05/22/19 02:00	SRA	TAL PHX
Total/NA	Prep	200.8			178328	05/17/19 05:12	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179495	05/30/19 00:02	ARE	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: APS - Four Corners CCR

Job ID: 550-122988-1

Client Sample ID: FC-CCR-MW56-51419

Lab Sample ID: 550-122988-17

Date Collected: 05/14/19 17:04
Matrix: Water
Date Received: 05/16/19 16:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.8			178328	05/17/19 05:12	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179533	05/31/19 01:44	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	178347		YET	TAL PHX
					(Start)	05/17/19 08:38		
					(End)	05/20/19 10:10		
Total/NA	Analysis	SM 4500 H+ B		1	178835	05/22/19 11:45	MRR	TAL PHX

Client Sample ID: FC-CCR-DMX4-51419

Lab Sample ID: 550-122988-18

Date Collected: 05/14/19 13:17
Matrix: Water
Date Received: 05/16/19 16:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	179480	05/30/19 09:39	NEL	TAL PHX
Total/NA	Analysis	300.0		100	179611	05/31/19 01:47	KJS	TAL PHX
Total/NA	Prep	200.7			178331	05/17/19 06:07	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	178805	05/22/19 02:06	SRA	TAL PHX
Total/NA	Prep	200.8			178328	05/17/19 05:12	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179495	05/30/19 00:04	ARE	TAL PHX
Total/NA	Prep	200.8			178328	05/17/19 05:12	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		1	179533	05/31/19 01:46	ARE	TAL PHX
Total/NA	Analysis	SM 2540C		1	178347		YET	TAL PHX
					(Start)	05/17/19 08:38		
					(End)	05/20/19 10:10		
Total/NA	Analysis	SM 4500 H+ B		1	178835	05/22/19 11:45	MRR	TAL PHX

Laboratory References:

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

Accreditation/Certification Summary

Client: Arizona Public Service Company
Job ID: 550-122988-1
Project/Site: APS - Four Corners CCR

Laboratory: Eurofins TestAmerica, Phoenix

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Arizona	State Program	9	AZ0728	06-09-19 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Arizona Public Service Company
Project/Site: APS - Four Corners CCR

Job ID: 550-122988-1

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL PHX
200.7 Rev 4.4	Metals (ICP)	40CFR136A	TAL PHX
200.8 LL	Metals (ICP/MS)	EPA	TAL PHX
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PHX
SM 4500 H+ B	pH	SM	TAL PHX
200.7	Preparation, Total Metals	EPA	TAL PHX
200.8	Preparation, Total Metals	EPA	TAL PHX

Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.
EPA = US Environmental Protection Agency
MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
SM = "Standard Methods For The Examination Of Water And Wastewater"

Laboratory References:

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

TestAmerica Phoenix
4645 E Cotton Ctr Blvd Bdg 3
Phoenix, AZ 85040
phone 602.437.3340 fax 623.445.6192

122988

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

6/6/2019

Client Contact	Project Manager: Doug Lavarnway	Site Contact: Doug Lavarnway	Date:	COC No:
APS Four Corners	Tel/Fax: 928-587-0319	Lab Contact: Ken Baker	Carrier:	1 of 2 COCs
PO Box 355, MS 4915	Analysis Turnaround Time			Job No.
Fruitland, NM 87416	Calendar (C) or Work Days (W) _____			
Phone:	TAT if different from Below 7 Days			SDG No.
Fax:	☐ 2 weeks			
Project Name: CCR	☐ 1 week			
E-Mail Address:	☐ 2 days			
	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	Perform MS / MSD (Y / N)	EPA 200.7 (B, Ca, Li)	200.8 (As, Ba, Cd, Co, Pb, Mo, Se, Tl)	EPA 300.0 (Cl, F, SO4)	SM 4500-HB (pH)	SM 2540C (TDS)	Sample Specific Notes:
FC-CCR-MW49A-51419 -01	5/14/2019	1912	G	W	2	N		X	X	X	X	X	
FC-CCR-MW61-51319 -02	5/13/2019	1949	G	W	2	N		X	X	X	X	X	
FC-CCR-MW74-51319 -03	5/13/2019	1859	G	W	2	N		X	X	X	X	X	
FC-CCR-MW75-51319 -04	5/13/19	2019	G	W	2	N		X	X	X	X	X	
FC-CCR-MW7-51419 -05	5/14/19	849	G	W	2	N		X	X	X	X	X	
FC-CCR-MW8-51419 -06	5/14/19	752	G	W	2	N		X	X	X	X	X	
FC-CCR-MW87-51419 -07	5/14/19	1218	G	W	2	N		X	X	X	X	X	
FC-CCR-MW6-51419 -08	5/14/19	1438	G	W	2	N		X	X	X	X	X	
FC-CCR-MW38R-51419 -09	5/14/19	1617	G	W	2	N		X	X	X	X	X	
FC-CCR-MW57-51419 -10	5/14/19	1425	G	W	2	N	X	X	X	X	X	X	
FC-CCR-MW17R-51419 -11	5/14/19	1801	G	W	2	N		X	X	X	X	X	
FC-CCR-FD01-51419 -12	5/14/19	1801	G	W	2	N		X	X	X	X	X	

550-122988 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant Poison B ☐ Unknown ☐

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Special Instructions/QC Requirements & Comments:
Method 200.8 with collision cell

5.5°C PC

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Doug Lavarnway	APS	5/16/1600			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company: APHO	Date/Time: 5-16-19 1600

TestAmerica Phoenix
4645 E Cotton Ctr Blvd Bdg 3
Phoenix, AZ 85040

phone 602.437.3340 fax 623.445.6192

Chain of Custody Record

122988

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

6/6/2019

Client Contact	Project Manager: Doug Lavarnway	Site Contact: Doug Lavarnway	Date:	COC No:
APS Four Corners	Tel/Fax: 928-587-0319	Lab Contact: Ken Baker	Carrier:	2 of 2 COCs
PO Box 355, MS 4915	Analysis Turnaround Time			Job No.
Fruitland, NM 87416	Calendar (C) or Work Days (W) _____			
Phone:	TAT if different from Below 7 Days			SDG No.
Fax:	☐ 2 weeks			
Project Name: CCR	☐ 1 week			
E-Mail Address:	☐ 2 days			
	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	Perform MS / MSD (Y / N)	EPA 200.7 (B, Ca, Li)	200.8 (As, Ba, Cd, Co, Pb, Mo, Se, Tl)	EPA 300.0 (Cl, F, SO4)	SM 4500-HB (pH)	SM 2540C (TDS)	Sample Specific Notes:
FC-CCR-MW15-51419 -13	5/14/2019	1046	G	W		N		X	X	X	X	X	
FC-CCR-DMX6-51419 -14	5/14/2019	1128	G	W		N		X	X	X	X	X	
FC-CCR-MW16-51419 -15	5/14/2019	927	G	W		N		X	X	X	X	X	
FC-CCR-FD02-51419 -16	5/14/2019	927	G	W		N		X	X	X	X	X	
FC-CCR-MW56-51419 -17	5/14/2019	1704	G	W		N		X	X	X	X	X	
FC-CCR-DMX4-51419 -18	5/14/2019	1317	G	W		N		X	X	X	X	X	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant Poison B ☐ Unknown ☐

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Special Instructions/QC Requirements & Comments:
Method 200.8 with collision cell

5,5°C

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Doug Lavarnway	APS	5/16 1600			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company: TAPHX	Date/Time: 5-16-19 1600

Login Sample Receipt Checklist

Client: Arizona Public Service Company

Job Number: 550-122988-1

Login Number: 122988
List Number: 1
Creator: Gravlin, Andrea

List Source: Eurofins TestAmerica, Phoenix

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

eurofins | Environment Testing TestAmerica



ANALYTICAL REPORT

Eurofins TestAmerica, Phoenix
4625 East Cotton Ctr Blvd
Suite 189
Phoenix, AZ 85040
Tel: (602)437-3340

Laboratory Job ID: 550-133678-1
Client Project/Site: CCR

For:
Arizona Public Service Company
PO BOX 188, Ste. 4458
Joseph City, Arizona 86032

Attn: Jim Edwards

Authorized for release by:
12/19/2019 9:37:24 AM

Ken Baker, Project Manager II
(602)659-7624
ken.baker@testamericainc.com

LINKS

Review your project results through TotalAccess

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

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

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Definitions/Glossary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-133678-1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
D1	Sample required dilution due to matrix.
D2	Sample required dilution due to high concentration of analyte.
D5	Minimum Reporting Limit (MRL) adjusted due to sample dilution; analyte was non-detect in the sample.

Metals

Qualifier	Qualifier Description
D1	Sample required dilution due to matrix.
D2	Sample required dilution due to high concentration of analyte.
M1	Matrix spike recovery was high, the associated blank spike recovery was acceptable.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated blank spike was acceptable.

General Chemistry

Qualifier	Qualifier Description
D2	Sample required dilution due to high concentration of analyte.
H5	This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.

Glossary

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

Job ID: 550-133678-1

Laboratory: Eurofins TestAmerica, Phoenix

Narrative

Job Narrative
550-133678-1

Comments
No additional comments.

Receipt
The samples were received on 11/21/2019 11:23 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.6º C and 1.9º C.

HPLC/IC
Method 300.0: The following samples were diluted for Fluoride by method EPA 300.0 due to the nature of the samples matrix: FC-CCR-MW7-111919 (550-133678-4), FC-CCR-MW8-111919 (550-133678-5), FC-CCR-MW87-111919 (550-133678-6), FC-CCR-MW6-111919 (550-133678-7), FC-CCR-MW38R-111919 (550-133678-8), FC-CCR-MW57-111919 (550-133678-9), FC-CCR-FD01-111919 (550-133678-10), FC-CCR-MW17R-111919 (550-133678-11), FC-CCR-MW15-111919 (550-133678-12), FC-CCR-DMX6-111919 (550-133678-13), FC-CCR-MW16-111919 (550-133678-14), FC-CCR-FD02-111919 (550-133678-15), FC-CCR-MW56-111919 (550-133678-16) and FC-CCR-DMX4-111919 (550-133678-17). The samples contained high concentrations of Chloride and Sulfate which exceeded the instrument's maximum column capacity. Fluoride was not detected in the diluted samples. As such, elevated reporting limits (RLs) have been provided and these data have been qualified with D1 and D5 flags.

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

Metals
Method 200.7 Rev 4.4: The following samples were diluted to bring the concentration of target analytes within the calibration range: FC-CCR-MW49A-111919 (550-133678-1), FC-CCR-MW49A-111919 (550-133678-1[MS]) and FC-CCR-MW49A-111919 (550-133678-1[MSD]). Elevated reporting limits (RLs) are provided.

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

General Chemistry
Method SM 2540C:

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

Sample Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-133678-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
550-133678-1	FC-CCR-MW49A-111919	Water	11/19/19 08:07	11/21/19 11:23	
550-133678-2	FC-CCR-MW61-111919	Water	11/19/19 09:38	11/21/19 11:23	
550-133678-3	FC-CCR-MW75-111919	Water	11/19/19 10:15	11/21/19 11:23	
550-133678-4	FC-CCR-MW7-111919	Water	11/19/19 11:56	11/21/19 11:23	
550-133678-5	FC-CCR-MW8-111919	Water	11/19/19 12:29	11/21/19 11:23	
550-133678-6	FC-CCR-MW87-111919	Water	11/19/19 17:25	11/21/19 11:23	
550-133678-7	FC-CCR-MW6-111919	Water	11/19/19 15:43	11/21/19 11:23	
550-133678-8	FC-CCR-MW38R-111919	Water	11/19/19 13:09	11/21/19 11:23	
550-133678-9	FC-CCR-MW57-111919	Water	11/19/19 13:50	11/21/19 11:23	
550-133678-10	FC-CCR-FD01-111919	Water	11/19/19 13:09	11/21/19 11:23	
550-133678-11	FC-CCR-MW17R-111919	Water	11/19/19 14:28	11/21/19 11:23	
550-133678-12	FC-CCR-MW15-111919	Water	11/19/19 18:46	11/21/19 11:23	
550-133678-13	FC-CCR-DMX6-111919	Water	11/19/19 18:11	11/21/19 11:23	
550-133678-14	FC-CCR-MW16-111919	Water	11/19/19 19:31	11/21/19 11:23	
550-133678-15	FC-CCR-FD02-111919	Water	11/19/19 17:25	11/21/19 11:23	
550-133678-16	FC-CCR-MW56-111919	Water	11/19/19 15:01	11/21/19 11:23	
550-133678-17	FC-CCR-DMX4-111919	Water	11/19/19 16:34	11/21/19 11:23	

Detection Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-133678-1

Client Sample ID: FC-CCR-MW49A-111919 — Lab Sample ID: 550-133678-1

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	400	D2	400		mg/L	200		300.0	Total/NA
Sulfate	12000	D2	400		mg/L	200		300.0	Total/NA
Boron	6.2	M3	0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	380	M3	2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.77		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0011	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Barium	0.022		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00025		0.00010		mg/L	1		200.8 LL	Total/NA
Chromium	0.0020		0.0010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0010		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.082		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0010	M1	0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.0013		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	18000	D2	200		mg/L	1		SM 2540C	Total/NA
pH	7.5	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	9.1	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW61-111919 — Lab Sample ID: 550-133678-2

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	320	D2	100		mg/L	50		300.0	Total/NA
Fluoride	1.4	D1	0.80		mg/L	2		300.0	Total/NA
Sulfate	3500	D2	100		mg/L	50		300.0	Total/NA
Boron	39		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	500		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.38		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.015		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00097		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.021		0.00050		mg/L	1		200.8 LL	Total/NA
Lead	0.00095		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.098		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.00082		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00020		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	5200	D2	100		mg/L	1		SM 2540C	Total/NA
pH	8.6	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	8.8	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW75-111919 — Lab Sample ID: 550-133678-3

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	290	D2	100		mg/L	50		300.0	Total/NA
Fluoride	1.2	D1	0.80		mg/L	2		300.0	Total/NA
Sulfate	4400	D2	100		mg/L	50		300.0	Total/NA
Boron	24		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	450		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.41		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.00056		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.019		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.0020		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.045		0.00050		mg/L	1		200.8 LL	Total/NA
Lead	0.0030		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.19		0.00050		mg/L	1		200.8 LL	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-MW75-111919 (Continued) — Lab Sample ID: 550-133678-3

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Selenium	0.0029		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00022		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	6600	D2	100		mg/L	1		SM 2540C	Total/NA
pH	8.3	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	9.0	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW7-111919 — Lab Sample ID: 550-133678-4

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	620	D2	100		mg/L	50		300.0	Total/NA
Sulfate	5600	D2	200		mg/L	100		300.0	Total/NA
Boron	8.2		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	370		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.85		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.00086		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.015		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00031		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.00062		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0057		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0043		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00010		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	8900	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.3	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	10.0	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW8-111919 — Lab Sample ID: 550-133678-5

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	1200	D2	100		mg/L	50		300.0	Total/NA
Sulfate	9600	D2	200		mg/L	100		300.0	Total/NA
Boron	15		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	420		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	1.2		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.011		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00012		0.00010		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.011		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0014		0.00050		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	15000	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.1	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	10.1	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW87-111919 — Lab Sample ID: 550-133678-6

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	1600	D2	400		mg/L	200		300.0	Total/NA
Sulfate	18000	D2	400		mg/L	200		300.0	Total/NA
Boron	2.4		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	420		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	1.2		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0028	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Barium	0.015		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00024		0.00010		mg/L	1		200.8 LL	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-MW87-111919 (Continued) — Lab Sample ID: 550-133678-6

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Cobalt	0.0037		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.030		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.015		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00018		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	27000	D2	200		mg/L	1		SM 2540C	Total/NA
pH	7.3	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	11.7	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW6-111919 — Lab Sample ID: 550-133678-7

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	1900	D2	1000		mg/L	500		300.0	Total/NA
Sulfate	16000	D2	1000		mg/L	500		300.0	Total/NA
Boron	6.0		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	500		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	1.6		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0014	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Barium	0.015		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00016		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0010		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0040		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0010		0.00050		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	22000	D2	200		mg/L	1		SM 2540C	Total/NA
pH	7.3	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	12.0	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW38R-111919 — Lab Sample ID: 550-133678-8

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	270	D2	100		mg/L	50		300.0	Total/NA
Sulfate	4000	D2	400		mg/L	200		300.0	Total/NA
Boron	26		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	450		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.37		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.020		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00013		0.00010		mg/L	1		200.8 LL	Total/NA
Chromium	0.0011		0.0010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.23		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0050		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0010		0.00050		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	6100	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.5	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	12.3	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW57-111919 — Lab Sample ID: 550-133678-9

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	410	D2	200		mg/L	100		300.0	Total/NA
Sulfate	7100	D2	200		mg/L	100		300.0	Total/NA
Boron	1.4		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	410		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.70		0.20		mg/L	1		200.7 Rev 4.4	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-MW57-111919 (Continued) — Lab Sample ID: 550-133678-9

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Barium	0.017		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00020		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0024		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0067		0.00050		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	11000	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.3	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	12.2	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-FD01-111919 — Lab Sample ID: 550-133678-10

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	270	D2	200		mg/L	100		300.0	Total/NA
Sulfate	4000	D2	200		mg/L	100		300.0	Total/NA
Boron	27		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	450		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.37		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.00064		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.019		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00015		0.00010		mg/L	1		200.8 LL	Total/NA
Chromium	0.0011		0.0010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.23		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0049		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.00080		0.00050		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	5900	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.5	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	12.9	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW17R-111919 — Lab Sample ID: 550-133678-11

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	390	D2	200		mg/L	100		300.0	Total/NA
Sulfate	4100	D2	200		mg/L	100		300.0	Total/NA
Boron	36		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	460		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.42		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.019		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.0015		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.071		0.00050		mg/L	1		200.8 LL	Total/NA
Lead	0.0024		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0014		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.00055		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00026		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	6200	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.4	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	13.2	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW15-111919 — Lab Sample ID: 550-133678-12

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	1000	D2	200		mg/L	100		300.0	Total/NA
Sulfate	6600	D2	200		mg/L	100		300.0	Total/NA
Boron	8.2		0.050		mg/L	1		200.7 Rev 4.4	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-MW15-111919 (Continued) — Lab Sample ID: 550-133678-12

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Calcium	440		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.91		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.018		0.00050		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0022		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0034		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00012		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	11000	D2	100		mg/L	1		SM 2540C	Total/NA
pH	6.9	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	12.9	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-DMX6-111919 — Lab Sample ID: 550-133678-13

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	710	D2	200		mg/L	100		300.0	Total/NA
Sulfate	7300	D2	200		mg/L	100		300.0	Total/NA
Boron	6.1		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	360		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.81		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.0090		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00031		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.00094		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.017		0.00050		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	12000	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.2	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	12.8	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW16-111919 — Lab Sample ID: 550-133678-14

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	900	D2	200		mg/L	100		300.0	Total/NA
Sulfate	11000	D2	400		mg/L	200		300.0	Total/NA
Boron	7.1		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	420		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	1.2		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0011	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Barium	0.020		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00015		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0072		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.00073		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.032		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00041		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	17000	D2	200		mg/L	1		SM 2540C	Total/NA
pH	7.1	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	13.4	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-FD02-111919 — Lab Sample ID: 550-133678-15

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	1700	D2	400		mg/L	200		300.0	Total/NA
Sulfate	18000	D2	400		mg/L	200		300.0	Total/NA
Boron	2.4		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	440		2.0		mg/L	1		200.7 Rev 4.4	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-FD02-111919 (Continued) — Lab Sample ID: 550-133678-15

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	1.3		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0014	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Barium	0.015		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00024		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.0036		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.028		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.018		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00017		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	26000	D2	200		mg/L	1		SM 2540C	Total/NA
pH	7.4	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	7.7	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW56-111919 — Lab Sample ID: 550-133678-16

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	1900	D2	400		mg/L	200		300.0	Total/NA
Sulfate	15000	D2	400		mg/L	200		300.0	Total/NA
Boron	2.4		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	460		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	1.5		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0096		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.018		0.00050		mg/L	1		200.8 LL	Total/NA
Cadmium	0.00016		0.00010		mg/L	1		200.8 LL	Total/NA
Cobalt	0.00056		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0053		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.26		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00085		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	24000	D2	200		mg/L	1		SM 2540C	Total/NA
pH	7.2	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	8.1	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-DMX4-111919 — Lab Sample ID: 550-133678-17

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	510	D2	100		mg/L	50		300.0	Total/NA
Sulfate	6900	D2	200		mg/L	100		300.0	Total/NA
Boron	1.3		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	420		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.65		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.00069		0.00050		mg/L	1		200.8 LL	Total/NA
Barium	0.0088		0.00050		mg/L	1		200.8 LL	Total/NA
Cobalt	0.00093		0.00050		mg/L	1		200.8 LL	Total/NA
Molybdenum	0.0077		0.00050		mg/L	1		200.8 LL	Total/NA
Selenium	0.0016		0.00050		mg/L	1		200.8 LL	Total/NA
Thallium	0.00015		0.00010		mg/L	1		200.8 LL	Total/NA
Total Dissolved Solids	11000	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.7	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	8.9	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-MW49A-111919

Lab Sample ID: 550-133678-1

Date Collected: 11/19/19 08:07

Matrix: Water

Date Received: 11/21/19 11:23

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**400**	**D2**	400		mg/L			11/26/19 20:01	200
Fluoride	ND	D1	0.80		mg/L			11/26/19 19:06	2
Sulfate	**12000**	**D2**	400		mg/L			11/26/19 20:01	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		11/22/19 06:02	11/27/19 04:40	1
Boron	**6.2**	**M3**	0.050		mg/L		11/22/19 06:02	11/27/19 04:40	1
Calcium	**380**	**M3**	2.0		mg/L		11/22/19 06:02	11/27/19 04:40	1
Lithium	**0.77**		0.20		mg/L		11/22/19 06:02	11/27/19 04:40	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 20:44	1
Arsenic	**0.0011**	**D1**	0.0010		mg/L		11/21/19 15:26	12/03/19 14:03	2
Barium	**0.022**		0.00050		mg/L		11/21/19 15:26	11/29/19 20:44	1
Cadmium	**0.00025**		0.00010		mg/L		11/21/19 15:26	11/29/19 20:44	1
Chromium	**0.0020**		0.0010		mg/L		11/21/19 15:26	11/29/19 20:44	1
Cobalt	**0.0010**		0.00050		mg/L		11/21/19 15:26	11/29/19 20:44	1
Lead	ND		0.00050		mg/L		11/21/19 15:26	11/29/19 20:44	1
Molybdenum	**0.082**		0.00050		mg/L		11/21/19 15:26	11/29/19 20:44	1
Selenium	**0.0010**	**M1**	0.00050		mg/L		11/21/19 15:26	11/29/19 20:44	1
Thallium	**0.0013**		0.00010		mg/L		11/21/19 15:26	11/29/19 20:44	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND	M1	0.00020		mg/L		11/26/19 10:00	11/27/19 13:47	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**18000**	**D2**	200		mg/L			11/22/19 08:51	1
pH	**7.5**	**H5**	1.7		SU			11/25/19 18:45	1
Temperature	**9.1**	**H5**	0.1		Degrees C			11/25/19 18:45	1

Client Sample ID: FC-CCR-MW61-111919

Lab Sample ID: 550-133678-2

Date Collected: 11/19/19 09:38

Matrix: Water

Date Received: 11/21/19 11:23

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**320**	**D2**	100		mg/L			11/26/19 21:15	50
Fluoride	**1.4**	**D1**	0.80		mg/L			11/26/19 20:56	2
Sulfate	**3500**	**D2**	100		mg/L			11/26/19 21:15	50

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		11/22/19 06:02	11/27/19 04:43	1
Boron	**39**		0.050		mg/L		11/22/19 06:02	11/27/19 04:43	1
Calcium	**500**		2.0		mg/L		11/22/19 06:02	11/27/19 04:43	1
Lithium	**0.38**		0.20		mg/L		11/22/19 06:02	11/27/19 04:43	1

Client Sample ID: FC-CCR-MW61-111919

Lab Sample ID: 550-133678-2

Date Collected: 11/19/19 09:38

Matrix: Water

Date Received: 11/21/19 11:23

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 20:46	1
Arsenic	ND		0.00050		mg/L		11/21/19 15:26	12/03/19 14:05	1
Barium	**0.015**		0.00050		mg/L		11/21/19 15:26	11/29/19 20:46	1
Cadmium	**0.00097**		0.00010		mg/L		11/21/19 15:26	11/29/19 20:46	1
Chromium	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 20:46	1
Cobalt	**0.021**		0.00050		mg/L		11/21/19 15:26	11/29/19 20:46	1
Lead	**0.00095**		0.00050		mg/L		11/21/19 15:26	11/29/19 20:46	1
Molybdenum	**0.098**		0.00050		mg/L		11/21/19 15:26	11/29/19 20:46	1
Selenium	**0.00082**		0.00050		mg/L		11/21/19 15:26	11/29/19 20:46	1
Thallium	**0.00020**		0.00010		mg/L		11/21/19 15:26	11/29/19 20:46	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		11/26/19 10:00	11/27/19 13:53	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**5200**	**D2**	100		mg/L			11/22/19 08:51	1
pH	**8.6**	**H5**	1.7		SU			11/25/19 18:45	1
Temperature	**8.8**	**H5**	0.1		Degrees C			11/25/19 18:45	1

Client Sample ID: FC-CCR-MW75-111919

Lab Sample ID: 550-133678-3

Date Collected: 11/19/19 10:15

Matrix: Water

Date Received: 11/21/19 11:23

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**290**	**D2**	100		mg/L			11/26/19 21:52	50
Fluoride	**1.2**	**D1**	0.80		mg/L			11/26/19 21:33	2
Sulfate	**4400**	**D2**	100		mg/L			11/26/19 21:52	50

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		11/22/19 06:02	11/27/19 04:47	1
Boron	**24**		0.050		mg/L		11/22/19 06:02	11/27/19 04:47	1
Calcium	**450**		2.0		mg/L		11/22/19 06:02	11/27/19 04:47	1
Lithium	**0.41**		0.20		mg/L		11/22/19 06:02	11/27/19 04:47	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 20:49	1
Arsenic	**0.00056**		0.00050		mg/L		11/21/19 15:26	12/03/19 14:07	1
Barium	**0.019**		0.00050		mg/L		11/21/19 15:26	11/29/19 20:49	1
Cadmium	**0.0020**		0.00010		mg/L		11/21/19 15:26	11/29/19 20:49	1
Chromium	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 20:49	1
Cobalt	**0.045**		0.00050		mg/L		11/21/19 15:26	11/29/19 20:49	1
Lead	**0.0030**		0.00050		mg/L		11/21/19 15:26	11/29/19 20:49	1
Molybdenum	**0.19**		0.00050		mg/L		11/21/19 15:26	11/29/19 20:49	1
Selenium	**0.0029**		0.00050		mg/L		11/21/19 15:26	11/29/19 20:49	1
Thallium	**0.00022**		0.00010		mg/L		11/21/19 15:26	11/29/19 20:49	1

Client Sample ID: FC-CCR-MW75-111919

Lab Sample ID: 550-133678-3

Date Collected: 11/19/19 10:15

Matrix: Water

Date Received: 11/21/19 11:23

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		11/26/19 10:00	11/27/19 13:55	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**6600**	**D2**	100		mg/L			11/22/19 08:51	1
pH	**8.3**	**H5**	1.7		SU			11/25/19 18:45	1
Temperature	**9.0**	**H5**	0.1		Degrees C			11/25/19 18:45	1

Client Sample ID: FC-CCR-MW7-111919

Lab Sample ID: 550-133678-4

Date Collected: 11/19/19 11:56

Matrix: Water

Date Received: 11/21/19 11:23

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**620**	**D2**	100		mg/L			11/26/19 23:05	50
Fluoride	ND	D1 D5	0.80		mg/L			11/26/19 22:47	2
Sulfate	**5600**	**D2**	200		mg/L			11/27/19 15:10	100

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		11/22/19 06:02	11/27/19 04:50	1
Boron	**8.2**		0.050		mg/L		11/22/19 06:02	11/27/19 04:50	1
Calcium	**370**		2.0		mg/L		11/22/19 06:02	11/27/19 04:50	1
Lithium	**0.85**		0.20		mg/L		11/22/19 06:02	11/27/19 04:50	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 20:51	1
Arsenic	**0.00086**		0.00050		mg/L		11/21/19 15:26	12/03/19 14:09	1
Barium	**0.015**		0.00050		mg/L		11/21/19 15:26	11/29/19 20:51	1
Cadmium	**0.00031**		0.00010		mg/L		11/21/19 15:26	11/29/19 20:51	1
Chromium	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 20:51	1
Cobalt	**0.00062**		0.00050		mg/L		11/21/19 15:26	11/29/19 20:51	1
Lead	ND		0.00050		mg/L		11/21/19 15:26	11/29/19 20:51	1
Molybdenum	**0.0057**		0.00050		mg/L		11/21/19 15:26	11/29/19 20:51	1
Selenium	**0.0043**		0.00050		mg/L		11/21/19 15:26	11/29/19 20:51	1
Thallium	**0.00010**		0.00010		mg/L		11/21/19 15:26	11/29/19 20:51	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		11/26/19 10:00	11/27/19 13:56	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**8900**	**D2**	100		mg/L			11/22/19 08:51	1
pH	**7.3**	**H5**	1.7		SU			11/25/19 18:45	1
Temperature	**10.0**	**H5**	0.1		Degrees C			11/25/19 18:45	1

Client Sample ID: FC-CCR-MW8-111919

Lab Sample ID: 550-133678-5

Date Collected: 11/19/19 12:29

Matrix: Water

Date Received: 11/21/19 11:23

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1200**	**D2**	100		mg/L			11/26/19 23:42	50
Fluoride	ND	D1 D5	0.80		mg/L			11/26/19 23:24	2
Sulfate	**9600**	**D2**	200		mg/L			11/27/19 15:28	100

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		11/22/19 06:02	11/27/19 04:54	1
Boron	**15**		0.050		mg/L		11/22/19 06:02	11/27/19 04:54	1
Calcium	**420**		2.0		mg/L		11/22/19 06:02	11/27/19 04:54	1
Lithium	**1.2**		0.20		mg/L		11/22/19 06:02	11/27/19 04:54	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 20:53	1
Arsenic	ND	D1	0.0010		mg/L		11/21/19 15:26	12/16/19 12:00	2
Barium	**0.011**		0.00050		mg/L		11/21/19 15:26	11/29/19 20:53	1
Cadmium	**0.00012**		0.00010		mg/L		11/21/19 15:26	11/29/19 20:53	1
Chromium	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 20:53	1
Cobalt	ND		0.00050		mg/L		11/21/19 15:26	11/29/19 20:53	1
Lead	ND		0.00050		mg/L		11/21/19 15:26	11/29/19 20:53	1
Molybdenum	**0.011**		0.00050		mg/L		11/21/19 15:26	11/29/19 20:53	1
Selenium	**0.0014**		0.00050		mg/L		11/21/19 15:26	11/29/19 20:53	1
Thallium	ND		0.00010		mg/L		11/21/19 15:26	11/29/19 20:53	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		11/26/19 10:00	11/27/19 13:58	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**15000**	**D2**	100		mg/L			11/22/19 08:51	1
pH	**7.1**	**H5**	1.7		SU			11/25/19 18:45	1
Temperature	**10.1**	**H5**	0.1		Degrees C			11/25/19 18:45	1

Client Sample ID: FC-CCR-MW87-111919

Lab Sample ID: 550-133678-6

Date Collected: 11/19/19 17:25

Matrix: Water

Date Received: 11/21/19 11:23

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1600**	**D2**	400		mg/L			11/27/19 00:19	200
Fluoride	ND	D1 D5	0.80		mg/L			11/27/19 00:00	2
Sulfate	**18000**	**D2**	400		mg/L			11/27/19 00:19	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		11/22/19 06:02	11/27/19 04:58	1
Boron	**2.4**		0.050		mg/L		11/22/19 06:02	11/27/19 04:58	1
Calcium	**420**		2.0		mg/L		11/22/19 06:02	11/27/19 04:58	1
Lithium	**1.2**		0.20		mg/L		11/22/19 06:02	11/27/19 04:58	1

Client Sample ID: FC-CCR-MW87-111919

Lab Sample ID: 550-133678-6

Date Collected: 11/19/19 17:25

Matrix: Water

Date Received: 11/21/19 11:23

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 20:55	1
Arsenic	**0.0028**	**D1**	0.0010		mg/L		11/21/19 15:26	12/18/19 09:39	2
Barium	**0.015**		0.00050		mg/L		11/21/19 15:26	11/29/19 20:55	1
Cadmium	**0.00024**		0.00010		mg/L		11/21/19 15:26	11/29/19 20:55	1
Chromium	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 20:55	1
Cobalt	**0.0037**		0.00050		mg/L		11/21/19 15:26	11/29/19 20:55	1
Lead	ND		0.00050		mg/L		11/21/19 15:26	11/29/19 20:55	1
Molybdenum	**0.030**		0.00050		mg/L		11/21/19 15:26	11/29/19 20:55	1
Selenium	**0.015**		0.00050		mg/L		11/21/19 15:26	11/29/19 20:55	1
Thallium	**0.00018**		0.00010		mg/L		11/21/19 15:26	11/29/19 20:55	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		11/26/19 10:00	11/27/19 13:59	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**27000**	**D2**	200		mg/L			11/22/19 08:51	1
pH	**7.3**	**H5**	1.7		SU			11/25/19 18:45	1
Temperature	**11.7**	**H5**	0.1		Degrees C			11/25/19 18:45	1

Client Sample ID: FC-CCR-MW6-111919

Lab Sample ID: 550-133678-7

Date Collected: 11/19/19 15:43

Matrix: Water

Date Received: 11/21/19 11:23

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1900**	**D2**	1000		mg/L			11/27/19 00:56	500
Fluoride	ND	D1 D5	0.80		mg/L			11/27/19 15:46	2
Sulfate	**16000**	**D2**	1000		mg/L			11/27/19 00:56	500

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		11/22/19 06:02	11/27/19 05:01	1
Boron	**6.0**		0.050		mg/L		11/22/19 06:02	11/27/19 05:01	1
Calcium	**500**		2.0		mg/L		11/22/19 06:02	11/27/19 05:01	1
Lithium	**1.6**		0.20		mg/L		11/22/19 06:02	11/27/19 05:01	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 20:57	1
Arsenic	**0.0014**	**D1**	0.0010		mg/L		11/21/19 15:26	12/16/19 12:02	2
Barium	**0.015**		0.00050		mg/L		11/21/19 15:26	11/29/19 20:57	1
Cadmium	**0.00016**		0.00010		mg/L		11/21/19 15:26	11/29/19 20:57	1
Chromium	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 20:57	1
Cobalt	**0.0010**		0.00050		mg/L		11/21/19 15:26	11/29/19 20:57	1
Lead	ND		0.00050		mg/L		11/21/19 15:26	11/29/19 20:57	1
Molybdenum	**0.0040**		0.00050		mg/L		11/21/19 15:26	11/29/19 20:57	1
Selenium	**0.0010**		0.00050		mg/L		11/21/19 15:26	11/29/19 20:57	1
Thallium	ND		0.00010		mg/L		11/21/19 15:26	11/29/19 20:57	1

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-133678-1

Client Sample ID: FC-CCR-MW6-111919

Lab Sample ID: 550-133678-7

Date Collected: 11/19/19 15:43
Matrix: Water
Date Received: 11/21/19 11:23

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		11/26/19 10:00	11/27/19 14:01	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**22000**	**D2**	200		mg/L			11/22/19 08:51	1
pH	**7.3**	**H5**	1.7		SU			11/25/19 18:45	1
Temperature	**12.0**	**H5**	0.1		Degrees C			11/25/19 18:45	1

Client Sample ID: FC-CCR-MW38R-111919

Lab Sample ID: 550-133678-8

Date Collected: 11/19/19 13:09
Matrix: Water
Date Received: 11/21/19 11:23

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**270**	**D2**	100		mg/L			11/27/19 16:05	50
Fluoride	ND	D1 D5	0.80		mg/L			11/27/19 01:14	2
Sulfate	**4000**	**D2**	400		mg/L			11/27/19 01:32	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		11/22/19 06:02	11/27/19 05:05	1
Boron	**26**		0.050		mg/L		11/22/19 06:02	11/27/19 05:05	1
Calcium	**450**		2.0		mg/L		11/22/19 06:02	11/27/19 05:05	1
Lithium	**0.37**		0.20		mg/L		11/22/19 06:02	11/27/19 05:05	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 21:03	1
Arsenic	ND		0.00050		mg/L		11/21/19 15:26	12/15/19 02:27	1
Barium	**0.020**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:03	1
Cadmium	**0.00013**		0.00010		mg/L		11/21/19 15:26	11/29/19 21:03	1
Chromium	**0.0011**		0.0010		mg/L		11/21/19 15:26	11/29/19 21:03	1
Cobalt	**0.23**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:03	1
Lead	ND		0.00050		mg/L		11/21/19 15:26	11/29/19 21:03	1
Molybdenum	**0.0050**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:03	1
Selenium	**0.0010**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:03	1
Thallium	ND		0.00010		mg/L		11/21/19 15:26	11/29/19 21:03	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		11/26/19 10:00	11/27/19 14:05	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**6100**	**D2**	100		mg/L			11/22/19 08:51	1
pH	**7.5**	**H5**	1.7		SU			11/25/19 18:45	1
Temperature	**12.3**	**H5**	0.1		Degrees C			11/25/19 18:45	1

Client Sample ID: FC-CCR-MW57-111919

Lab Sample ID: 550-133678-9

Date Collected: 11/19/19 13:50

Matrix: Water

Date Received: 11/21/19 11:23

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**410**	**D2**	200		mg/L			11/27/19 02:46	100
Fluoride	ND	D1 D5	0.80		mg/L			11/27/19 02:28	2
Sulfate	**7100**	**D2**	200		mg/L			11/27/19 02:46	100

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		11/22/19 06:02	11/27/19 05:08	1
Boron	**1.4**		0.050		mg/L		11/22/19 06:02	11/27/19 05:08	1
Calcium	**410**		2.0		mg/L		11/22/19 06:02	11/27/19 05:08	1
Lithium	**0.70**		0.20		mg/L		11/22/19 06:02	11/27/19 05:08	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 21:05	1
Arsenic	ND	D1	0.0010		mg/L		11/21/19 15:26	12/16/19 12:04	2
Barium	**0.017**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:05	1
Cadmium	**0.00020**		0.00010		mg/L		11/21/19 15:26	11/29/19 21:05	1
Chromium	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 21:05	1
Cobalt	**0.0024**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:05	1
Lead	ND		0.00050		mg/L		11/21/19 15:26	11/29/19 21:05	1
Molybdenum	**0.0067**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:05	1
Selenium	ND		0.00050		mg/L		11/21/19 15:26	11/29/19 21:05	1
Thallium	ND		0.00010		mg/L		11/21/19 15:26	11/29/19 21:05	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		11/26/19 10:00	11/27/19 14:07	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**11000**	**D2**	100		mg/L			11/22/19 08:51	1
pH	**7.3**	**H5**	1.7		SU			11/25/19 18:45	1
Temperature	**12.2**	**H5**	0.1		Degrees C			11/25/19 18:45	1

Client Sample ID: FC-CCR-FD01-111919

Lab Sample ID: 550-133678-10

Date Collected: 11/19/19 13:09

Matrix: Water

Date Received: 11/21/19 11:23

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**270**	**D2**	200		mg/L			11/27/19 03:23	100
Fluoride	ND	D1 D5	0.80		mg/L			11/27/19 03:04	2
Sulfate	**4000**	**D2**	200		mg/L			11/27/19 03:23	100

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		11/22/19 06:02	11/27/19 05:18	1
Boron	**27**		0.050		mg/L		11/22/19 06:02	11/27/19 05:18	1
Calcium	**450**		2.0		mg/L		11/22/19 06:02	11/27/19 05:18	1
Lithium	**0.37**		0.20		mg/L		11/22/19 06:02	11/27/19 05:18	1

Client Sample ID: FC-CCR-FD01-111919

Lab Sample ID: 550-133678-10

Date Collected: 11/19/19 13:09

Matrix: Water

Date Received: 11/21/19 11:23

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 21:07	1
Arsenic	**0.00064**		0.00050		mg/L		11/21/19 15:26	12/15/19 02:31	1
Barium	**0.019**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:07	1
Cadmium	**0.00015**		0.00010		mg/L		11/21/19 15:26	11/29/19 21:07	1
Chromium	**0.0011**		0.0010		mg/L		11/21/19 15:26	11/29/19 21:07	1
Cobalt	**0.23**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:07	1
Lead	ND		0.00050		mg/L		11/21/19 15:26	11/29/19 21:07	1
Molybdenum	**0.0049**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:07	1
Selenium	**0.00080**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:07	1
Thallium	ND		0.00010		mg/L		11/21/19 15:26	11/29/19 21:07	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		11/26/19 10:00	11/27/19 14:08	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**5900**	**D2**	100		mg/L			11/22/19 08:51	1
pH	**7.5**	**H5**	1.7		SU			11/25/19 18:45	1
Temperature	**12.9**	**H5**	0.1		Degrees C			11/25/19 18:45	1

Client Sample ID: FC-CCR-MW17R-111919

Lab Sample ID: 550-133678-11

Date Collected: 11/19/19 14:28

Matrix: Water

Date Received: 11/21/19 11:23

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**390**	**D2**	200		mg/L			11/27/19 04:00	100
Fluoride	ND	D1 D5	0.80		mg/L			11/27/19 03:41	2
Sulfate	**4100**	**D2**	200		mg/L			11/27/19 04:00	100

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		11/22/19 06:02	11/27/19 05:21	1
Boron	**36**		0.050		mg/L		11/22/19 06:02	11/27/19 05:21	1
Calcium	**460**		2.0		mg/L		11/22/19 06:02	11/27/19 05:21	1
Lithium	**0.42**		0.20		mg/L		11/22/19 06:02	11/27/19 05:21	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 21:09	1
Arsenic	ND	D1	0.0010		mg/L		11/21/19 15:26	12/16/19 12:06	2
Barium	**0.019**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:09	1
Cadmium	**0.0015**		0.00010		mg/L		11/21/19 15:26	11/29/19 21:09	1
Chromium	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 21:09	1
Cobalt	**0.071**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:09	1
Lead	**0.0024**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:09	1
Molybdenum	**0.0014**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:09	1
Selenium	**0.00055**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:09	1
Thallium	**0.00026**		0.00010		mg/L		11/21/19 15:26	11/29/19 21:09	1

Client Sample ID: FC-CCR-MW17R-111919

Lab Sample ID: 550-133678-11

Date Collected: 11/19/19 14:28

Matrix: Water

Date Received: 11/21/19 11:23

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		11/26/19 10:00	11/27/19 14:10	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**6200**	**D2**	100		mg/L			11/22/19 08:51	1
pH	**7.4**	**H5**	1.7		SU			11/25/19 18:45	1
Temperature	**13.2**	**H5**	0.1		Degrees C			11/25/19 18:45	1

Client Sample ID: FC-CCR-MW15-111919

Lab Sample ID: 550-133678-12

Date Collected: 11/19/19 18:46

Matrix: Water

Date Received: 11/21/19 11:23

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1000**	**D2**	200		mg/L			11/27/19 04:36	100
Fluoride	ND	D1 D5	0.80		mg/L			11/27/19 04:18	2
Sulfate	**6600**	**D2**	200		mg/L			11/27/19 04:36	100

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		11/22/19 06:02	11/27/19 05:25	1
Boron	**8.2**		0.050		mg/L		11/22/19 06:02	11/27/19 05:25	1
Calcium	**440**		2.0		mg/L		11/22/19 06:02	11/27/19 05:25	1
Lithium	**0.91**		0.20		mg/L		11/22/19 06:02	11/27/19 05:25	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 21:12	1
Arsenic	ND	D1	0.0010		mg/L		11/21/19 15:26	12/16/19 12:08	2
Barium	**0.018**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:12	1
Cadmium	ND		0.00010		mg/L		11/21/19 15:26	11/29/19 21:12	1
Chromium	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 21:12	1
Cobalt	**0.0022**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:12	1
Lead	ND		0.00050		mg/L		11/21/19 15:26	11/29/19 21:12	1
Molybdenum	**0.0034**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:12	1
Selenium	ND		0.00050		mg/L		11/21/19 15:26	11/29/19 21:12	1
Thallium	**0.00012**		0.00010		mg/L		11/21/19 15:26	11/29/19 21:12	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		11/26/19 10:00	11/27/19 14:11	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**11000**	**D2**	100		mg/L			11/22/19 08:51	1
pH	**6.9**	**H5**	1.7		SU			11/25/19 18:45	1
Temperature	**12.9**	**H5**	0.1		Degrees C			11/25/19 18:45	1

Client Sample ID: FC-CCR-DMX6-111919

Lab Sample ID: 550-133678-13

Date Collected: 11/19/19 18:11

Matrix: Water

Date Received: 11/21/19 11:23

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**710**	**D2**	200		mg/L			11/27/19 05:13	100
Fluoride	ND	D1 D5	0.80		mg/L			11/27/19 04:55	2
Sulfate	**7300**	**D2**	200		mg/L			11/27/19 05:13	100

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		11/22/19 06:02	11/27/19 05:28	1
Boron	**6.1**		0.050		mg/L		11/22/19 06:02	11/27/19 05:28	1
Calcium	**360**		2.0		mg/L		11/22/19 06:02	11/27/19 05:28	1
Lithium	**0.81**		0.20		mg/L		11/22/19 06:02	11/27/19 05:28	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 21:14	1
Arsenic	ND	D1	0.0010		mg/L		11/21/19 15:26	12/16/19 12:10	2
Barium	**0.0090**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:14	1
Cadmium	**0.00031**		0.00010		mg/L		11/21/19 15:26	11/29/19 21:14	1
Chromium	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 21:14	1
Cobalt	**0.00094**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:14	1
Lead	ND		0.00050		mg/L		11/21/19 15:26	11/29/19 21:14	1
Molybdenum	**0.017**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:14	1
Selenium	ND		0.00050		mg/L		11/21/19 15:26	11/29/19 21:14	1
Thallium	ND		0.00010		mg/L		11/21/19 15:26	11/29/19 21:14	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		11/26/19 10:00	11/27/19 14:13	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**12000**	**D2**	100		mg/L			11/22/19 08:51	1
pH	**7.2**	**H5**	1.7		SU			11/25/19 18:45	1
Temperature	**12.8**	**H5**	0.1		Degrees C			11/25/19 18:45	1

Client Sample ID: FC-CCR-MW16-111919

Lab Sample ID: 550-133678-14

Date Collected: 11/19/19 19:31

Matrix: Water

Date Received: 11/21/19 11:23

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**900**	**D2**	200		mg/L			11/27/19 06:27	100
Fluoride	ND	D1 D5	0.80		mg/L			11/27/19 06:08	2
Sulfate	**11000**	**D2**	400		mg/L			11/27/19 16:23	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		11/22/19 06:02	11/27/19 05:32	1
Boron	**7.1**		0.050		mg/L		11/22/19 06:02	11/27/19 05:32	1
Calcium	**420**		2.0		mg/L		11/22/19 06:02	11/27/19 05:32	1
Lithium	**1.2**		0.20		mg/L		11/22/19 06:02	11/27/19 05:32	1

Client Sample ID: FC-CCR-MW16-111919

Lab Sample ID: 550-133678-14

Date Collected: 11/19/19 19:31

Matrix: Water

Date Received: 11/21/19 11:23

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010	mg/L		11/21/19 15:26	11/29/19 21:16	1
Arsenic	**0.0011**	**D1**	0.0010	mg/L		11/21/19 15:26	12/16/19 12:12	2
Barium	**0.020**		0.00050	mg/L		11/21/19 15:26	11/29/19 21:16	1
Cadmium	**0.00015**		0.00010	mg/L		11/21/19 15:26	11/29/19 21:16	1
Chromium	ND		0.0010	mg/L		11/21/19 15:26	11/29/19 21:16	1
Cobalt	**0.0072**		0.00050	mg/L		11/21/19 15:26	11/29/19 21:16	1
Lead	ND		0.00050	mg/L		11/21/19 15:26	11/29/19 21:16	1
Molybdenum	**0.00073**		0.00050	mg/L		11/21/19 15:26	11/29/19 21:16	1
Selenium	**0.032**		0.00050	mg/L		11/21/19 15:26	11/29/19 21:16	1
Thallium	**0.00041**		0.00010	mg/L		11/21/19 15:26	11/29/19 21:16	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020	mg/L		11/26/19 10:00	11/27/19 14:14	1

General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**17000**	**D2**	200	mg/L			11/22/19 08:51	1
pH	**7.1**	**H5**	1.7	SU			11/25/19 18:45	1
Temperature	**13.4**	**H5**	0.1	Degrees C			11/25/19 18:45	1

Client Sample ID: FC-CCR-FD02-111919

Lab Sample ID: 550-133678-15

Date Collected: 11/19/19 17:25

Matrix: Water

Date Received: 11/21/19 11:23

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1700**	**D2**	400	mg/L			11/27/19 07:04	200
Fluoride	ND	D1 D5	0.80	mg/L			11/27/19 06:45	2
Sulfate	**18000**	**D2**	400	mg/L			11/27/19 07:04	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010	mg/L		11/22/19 06:02	11/27/19 05:36	1
Boron	**2.4**		0.050	mg/L		11/22/19 06:02	11/27/19 05:36	1
Calcium	**440**		2.0	mg/L		11/22/19 06:02	11/27/19 05:36	1
Lithium	**1.3**		0.20	mg/L		11/22/19 06:02	11/27/19 05:36	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010	mg/L		11/21/19 15:26	11/29/19 21:18	1
Arsenic	**0.0014**	**D1**	0.0010	mg/L		11/21/19 15:26	12/16/19 12:15	2
Barium	**0.015**		0.00050	mg/L		11/21/19 15:26	11/29/19 21:18	1
Cadmium	**0.00024**		0.00010	mg/L		11/21/19 15:26	11/29/19 21:18	1
Chromium	ND		0.0010	mg/L		11/21/19 15:26	11/29/19 21:18	1
Cobalt	**0.0036**		0.00050	mg/L		11/21/19 15:26	11/29/19 21:18	1
Lead	ND		0.00050	mg/L		11/21/19 15:26	11/29/19 21:18	1
Molybdenum	**0.028**		0.00050	mg/L		11/21/19 15:26	11/29/19 21:18	1
Selenium	**0.018**		0.00050	mg/L		11/21/19 15:26	11/29/19 21:18	1
Thallium	**0.00017**		0.00010	mg/L		11/21/19 15:26	11/29/19 21:18	1

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-133678-1

Client Sample ID: FC-CCR-FD02-111919

Lab Sample ID: 550-133678-15

Date Collected: 11/19/19 17:25

Matrix: Water

Date Received: 11/21/19 11:23

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		11/26/19 10:00	11/27/19 14:16	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**26000**	**D2**	200		mg/L			11/22/19 08:51	1
pH	**7.4**	**H5**	1.7		SU			11/29/19 16:35	1
Temperature	**7.7**	**H5**	0.1		Degrees C			11/29/19 16:35	1

Client Sample ID: FC-CCR-MW56-111919

Lab Sample ID: 550-133678-16

Date Collected: 11/19/19 15:01

Matrix: Water

Date Received: 11/21/19 11:23

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1900**	**D2**	400		mg/L			11/27/19 07:40	200
Fluoride	ND	D1 D5	0.80		mg/L			11/27/19 07:22	2
Sulfate	**15000**	**D2**	400		mg/L			11/27/19 07:40	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		11/22/19 06:02	11/27/19 05:39	1
Boron	**2.4**		0.050		mg/L		11/22/19 06:02	11/27/19 05:39	1
Calcium	**460**		2.0		mg/L		11/22/19 06:02	11/27/19 05:39	1
Lithium	**1.5**		0.20		mg/L		11/22/19 06:02	11/27/19 05:39	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 21:20	1
Arsenic	**0.0096**		0.00050		mg/L		11/21/19 15:26	12/15/19 02:47	1
Barium	**0.018**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:20	1
Cadmium	**0.00016**		0.00010		mg/L		11/21/19 15:26	11/29/19 21:20	1
Chromium	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 21:20	1
Cobalt	**0.00056**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:20	1
Lead	ND		0.00050		mg/L		11/21/19 15:26	11/29/19 21:20	1
Molybdenum	**0.0053**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:20	1
Selenium	**0.26**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:20	1
Thallium	**0.00085**		0.00010		mg/L		11/21/19 15:26	11/29/19 21:20	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		11/26/19 10:00	11/27/19 14:17	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**24000**	**D2**	200		mg/L			11/22/19 08:51	1
pH	**7.2**	**H5**	1.7		SU			11/29/19 16:35	1
Temperature	**8.1**	**H5**	0.1		Degrees C			11/29/19 16:35	1

Client Sample Results

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-133678-1

Client Sample ID: FC-CCR-DMX4-111919

Lab Sample ID: 550-133678-17

Date Collected: 11/19/19 16:34

Matrix: Water

Date Received: 11/21/19 11:23

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**510**	**D2**	100		mg/L			11/27/19 08:17	50
Fluoride	ND	D1 D5	0.80		mg/L			11/27/19 07:59	2
Sulfate	**6900**	**D2**	200		mg/L			11/27/19 16:42	100

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		11/22/19 06:02	11/27/19 05:43	1
Boron	**1.3**		0.050		mg/L		11/22/19 06:02	11/27/19 05:43	1
Calcium	**420**		2.0		mg/L		11/22/19 06:02	11/27/19 05:43	1
Lithium	**0.65**		0.20		mg/L		11/22/19 06:02	11/27/19 05:43	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 21:22	1
Arsenic	**0.00069**		0.00050		mg/L		11/21/19 15:26	12/15/19 02:49	1
Barium	**0.0088**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:22	1
Cadmium	ND		0.00010		mg/L		11/21/19 15:26	11/29/19 21:22	1
Chromium	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 21:22	1
Cobalt	**0.00093**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:22	1
Lead	ND		0.00050		mg/L		11/21/19 15:26	11/29/19 21:22	1
Molybdenum	**0.0077**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:22	1
Selenium	**0.0016**		0.00050		mg/L		11/21/19 15:26	11/29/19 21:22	1
Thallium	**0.00015**		0.00010		mg/L		11/21/19 15:26	11/29/19 21:22	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		11/26/19 10:00	11/27/19 14:19	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**11000**	**D2**	100		mg/L			11/22/19 08:51	1
pH	**7.7**	**H5**	1.7		SU			11/29/19 16:35	1
Temperature	**8.9**	**H5**	0.1		Degrees C			11/29/19 16:35	1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 550-196743/2
Matrix: Water
Analysis Batch: 196743

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		2.0		mg/L			11/26/19 17:34	1
Fluoride	ND		0.40		mg/L			11/26/19 17:34	1
Sulfate	ND		2.0		mg/L			11/26/19 17:34	1

Lab Sample ID: LCS 550-196743/5
Matrix: Water
Analysis Batch: 196743

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride			20.0	21.3		mg/L		107	90 - 110		
Fluoride			4.00	4.16		mg/L		104	90 - 110		
Sulfate			20.0	20.8		mg/L		104	90 - 110		

Lab Sample ID: LCSD 550-196743/6
Matrix: Water
Analysis Batch: 196743

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride			20.0	21.4		mg/L		107	90 - 110	0	20
Fluoride			4.00	4.19		mg/L		105	90 - 110	1	20
Sulfate			20.0	20.7		mg/L		104	90 - 110	0	20

Lab Sample ID: 550-133678-1 MS
Matrix: Water
Analysis Batch: 196743

Client Sample ID: FC-CCR-MW49A-111919
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride	ND	D1	8.00	8.59	D1	mg/L		98	80 - 120		

Lab Sample ID: 550-133678-1 MS
Matrix: Water
Analysis Batch: 196743

Client Sample ID: FC-CCR-MW49A-111919
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride	400	D2	4000	4670	D2	mg/L		107	80 - 120		
Sulfate	12000	D2	4000	15600	D2	mg/L		91	80 - 120		

Lab Sample ID: 550-133678-1 MSD
Matrix: Water
Analysis Batch: 196743

Client Sample ID: FC-CCR-MW49A-111919
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	ND	D1	8.00	8.58	D1	mg/L		98	80 - 120	0	20

Lab Sample ID: 550-133678-1 MSD
Matrix: Water
Analysis Batch: 196743

Client Sample ID: FC-CCR-MW49A-111919
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	400	D2	4000	4670	D2	mg/L		107	80 - 120	0	20

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 550-133678-1 MSD
Matrix: Water
Analysis Batch: 196743

Client Sample ID: FC-CCR-MW49A-111919
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	12000	D2	4000	15600	D2	mg/L		91	80 - 120	0	20

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 550-196233/1-A
Matrix: Water
Analysis Batch: 196712

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 196233

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		11/22/19 06:02	11/27/19 04:24	1
Boron	ND		0.050		mg/L		11/22/19 06:02	11/27/19 04:24	1
Calcium	ND		2.0		mg/L		11/22/19 06:02	11/27/19 04:24	1
Lithium	ND		0.20		mg/L		11/22/19 06:02	11/27/19 04:24	1
Magnesium	ND		2.0		mg/L		11/22/19 06:02	11/27/19 04:24	1
Potassium	ND		0.50		mg/L		11/22/19 06:02	11/27/19 04:24	1
Sodium	ND		0.50		mg/L		11/22/19 06:02	11/27/19 04:24	1

Lab Sample ID: LCS 550-196233/2-A
Matrix: Water
Analysis Batch: 196712

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 196233

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Beryllium	1.00	0.989		mg/L		99	85 - 115
Boron	1.00	0.975		mg/L		98	85 - 115
Calcium	21.0	21.2		mg/L		101	85 - 115
Lithium	1.00	0.964		mg/L		96	85 - 115
Magnesium	21.0	21.2		mg/L		101	85 - 115
Potassium	20.0	19.8		mg/L		99	85 - 115
Sodium	20.0	19.2		mg/L		96	85 - 115

Lab Sample ID: LCSD 550-196233/3-A
Matrix: Water
Analysis Batch: 196712

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 196233

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Beryllium	1.00	0.971		mg/L		97	85 - 115	2	20
Boron	1.00	0.948		mg/L		95	85 - 115	3	20
Calcium	21.0	21.2		mg/L		101	85 - 115	0	20
Lithium	1.00	0.951		mg/L		95	85 - 115	1	20
Magnesium	21.0	21.0		mg/L		100	85 - 115	1	20
Potassium	20.0	19.7		mg/L		98	85 - 115	1	20
Sodium	20.0	19.3		mg/L		97	85 - 115	0	20

Lab Sample ID: 550-133678-1 MS
Matrix: Water
Analysis Batch: 196712

Client Sample ID: FC-CCR-MW49A-111919
Prep Type: Total/NA
Prep Batch: 196233

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Beryllium	ND		1.00	0.909		mg/L		91	70 - 130
Boron	6.2	M3	1.00	6.85	M3	mg/L		65	70 - 130

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: 550-133678-1 MS
Matrix: Water
Analysis Batch: 196712

Client Sample ID: FC-CCR-MW49A-111919
Prep Type: Total/NA
Prep Batch: 196233

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Calcium	380	M3	21.0	385	M3	mg/L		14	70 - 130
Lithium	0.77		1.00	1.76		mg/L		99	70 - 130
Potassium	57		20.0	76.4		mg/L		97	70 - 130

Lab Sample ID: 550-133678-1 MS
Matrix: Water
Analysis Batch: 196789

Client Sample ID: FC-CCR-MW49A-111919
Prep Type: Total/NA
Prep Batch: 196233

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Magnesium	650	M3 D2	21.0	657	D2 M3	mg/L		42	70 - 130
Sodium	4000	M3 D2	20.0	3920	D2 M3	mg/L		-292	70 - 130

Lab Sample ID: 550-133678-1 MSD
Matrix: Water
Analysis Batch: 196712

Client Sample ID: FC-CCR-MW49A-111919
Prep Type: Total/NA
Prep Batch: 196233

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Beryllium	ND		1.00	0.907		mg/L		91	70 - 130	0	20
Boron	6.2	M3	1.00	6.87	M3	mg/L		68	70 - 130	0	20
Calcium	380	M3	21.0	388	M3	mg/L		24	70 - 130	1	20
Lithium	0.77		1.00	1.75		mg/L		98	70 - 130	0	20
Potassium	57		20.0	76.7		mg/L		99	70 - 130	0	20

Lab Sample ID: 550-133678-1 MSD
Matrix: Water
Analysis Batch: 196789

Client Sample ID: FC-CCR-MW49A-111919
Prep Type: Total/NA
Prep Batch: 196233

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Magnesium	650	M3 D2	21.0	651	D2 M3	mg/L		13	70 - 130	1	20
Sodium	4000	M3 D2	20.0	3920	D2 M3	mg/L		-277	70 - 130	0	20

Method: 200.8 LL - Metals (ICP/MS)

Lab Sample ID: MB 550-196197/1-A
Matrix: Water
Analysis Batch: 196908

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 196197

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 20:34	1
Barium	ND		0.00050		mg/L		11/21/19 15:26	11/29/19 20:34	1
Cadmium	ND		0.00010		mg/L		11/21/19 15:26	11/29/19 20:34	1
Chromium	ND		0.0010		mg/L		11/21/19 15:26	11/29/19 20:34	1
Cobalt	ND		0.00050		mg/L		11/21/19 15:26	11/29/19 20:34	1
Lead	ND		0.00050		mg/L		11/21/19 15:26	11/29/19 20:34	1
Molybdenum	ND		0.00050		mg/L		11/21/19 15:26	11/29/19 20:34	1
Selenium	ND		0.00050		mg/L		11/21/19 15:26	11/29/19 20:34	1
Thallium	ND		0.00010		mg/L		11/21/19 15:26	11/29/19 20:34	1

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 550-196197/1-A
Matrix: Water
Analysis Batch: 197144

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 196197

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.00050		mg/L		11/21/19 15:26	12/03/19 13:42	1

Lab Sample ID: LCS 550-196197/2-A
Matrix: Water
Analysis Batch: 196908

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 196197

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Antimony			0.100	0.0954		mg/L		95	85 - 115		
Barium			0.100	0.101		mg/L		101	85 - 115		
Cadmium			0.100	0.0952		mg/L		95	85 - 115		
Chromium			0.100	0.0899		mg/L		90	85 - 115		
Cobalt			0.100	0.0923		mg/L		92	85 - 115		
Lead			0.100	0.0935		mg/L		94	85 - 115		
Molybdenum			0.100	0.0926		mg/L		93	85 - 115		
Selenium			0.100	0.0953		mg/L		95	85 - 115		
Thallium			0.100	0.0938		mg/L		94	85 - 115		

Lab Sample ID: LCS 550-196197/2-A
Matrix: Water
Analysis Batch: 197144

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 196197

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic			0.100	0.104		mg/L		104	85 - 115		

Lab Sample ID: LCSD 550-196197/3-A
Matrix: Water
Analysis Batch: 196908

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 196197

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony			0.100	0.0957		mg/L		96	85 - 115	0	20
Barium			0.100	0.101		mg/L		101	85 - 115	0	20
Cadmium			0.100	0.0954		mg/L		95	85 - 115	0	20
Chromium			0.100	0.0905		mg/L		90	85 - 115	1	20
Cobalt			0.100	0.0944		mg/L		94	85 - 115	2	20
Lead			0.100	0.0933		mg/L		93	85 - 115	0	20
Molybdenum			0.100	0.0935		mg/L		94	85 - 115	1	20
Selenium			0.100	0.0967		mg/L		97	85 - 115	1	20
Thallium			0.100	0.0932		mg/L		93	85 - 115	1	20

Lab Sample ID: LCSD 550-196197/3-A
Matrix: Water
Analysis Batch: 197144

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 196197

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic			0.100	0.103		mg/L		103	85 - 115	1	20

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Lab Sample ID: 550-133678-1 MS
Matrix: Water
Analysis Batch: 196908

Client Sample ID: FC-CCR-MW49A-111919
Prep Type: Total/NA
Prep Batch: 196197

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	ND		0.100	0.0993		mg/L		99	70 - 130
Barium	0.022		0.100	0.124		mg/L		103	70 - 130
Cadmium	0.00025		0.100	0.0913		mg/L		91	70 - 130
Chromium	0.0020		0.100	0.0944		mg/L		92	70 - 130
Cobalt	0.0010		0.100	0.0948		mg/L		94	70 - 130
Lead	ND		0.100	0.0888		mg/L		89	70 - 130
Molybdenum	0.082		0.100	0.184		mg/L		102	70 - 130
Selenium	0.0010	M1	0.100	0.141	M1	mg/L		140	70 - 130
Thallium	0.0013		0.100	0.0911		mg/L		90	70 - 130

Lab Sample ID: 550-133678-1 MS
Matrix: Water
Analysis Batch: 197144

Client Sample ID: FC-CCR-MW49A-111919
Prep Type: Total/NA
Prep Batch: 196197

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	0.0011	D1	0.100	0.108		mg/L		107	70 - 130

Lab Sample ID: 550-133678-1 MSD
Matrix: Water
Analysis Batch: 196908

Client Sample ID: FC-CCR-MW49A-111919
Prep Type: Total/NA
Prep Batch: 196197

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	ND		0.100	0.0988		mg/L		99	70 - 130	0	20
Barium	0.022		0.100	0.124		mg/L		103	70 - 130	0	20
Cadmium	0.00025		0.100	0.0919		mg/L		92	70 - 130	1	20
Chromium	0.0020		0.100	0.0926		mg/L		91	70 - 130	2	20
Cobalt	0.0010		0.100	0.0925		mg/L		91	70 - 130	2	20
Lead	ND		0.100	0.0881		mg/L		88	70 - 130	1	20
Molybdenum	0.082		0.100	0.185		mg/L		103	70 - 130	0	20
Selenium	0.0010	M1	0.100	0.139	M1	mg/L		138	70 - 130	1	20
Thallium	0.0013		0.100	0.0898		mg/L		88	70 - 130	1	20

Lab Sample ID: 550-133678-1 MSD
Matrix: Water
Analysis Batch: 197144

Client Sample ID: FC-CCR-MW49A-111919
Prep Type: Total/NA
Prep Batch: 196197

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	0.0011	D1	0.100	0.111		mg/L		110	70 - 130	3	20

Method: 245.1 - Mercury (CVAA)

Lab Sample ID: MB 550-196632/1-A
Matrix: Water
Analysis Batch: 196788

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 196632

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		11/26/19 10:00	11/27/19 13:35	1

Method: 245.1 - Mercury (CVAA) (Continued)

Lab Sample ID: LCS 550-196632/2-A
Matrix: Water
Analysis Batch: 196788

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 196632

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Hg			0.00500	0.00514		mg/L		103	85 - 115		

Lab Sample ID: LCSD 550-196632/3-A
Matrix: Water
Analysis Batch: 196788

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 196632

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Hg			0.00500	0.00531		mg/L		106	85 - 115	3	20

Lab Sample ID: 550-133678-1 MS
Matrix: Water
Analysis Batch: 196788

Client Sample ID: FC-CCR-MW49A-111919
Prep Type: Total/NA
Prep Batch: 196632

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Hg	ND	M1	0.00500	0.00674	M1	mg/L		135	70 - 130		

Lab Sample ID: 550-133678-1 MSD
Matrix: Water
Analysis Batch: 196788

Client Sample ID: FC-CCR-MW49A-111919
Prep Type: Total/NA
Prep Batch: 196632

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Hg	ND	M1	0.00500	0.00660	M1	mg/L		132	70 - 130	2	20

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

Lab Sample ID: MB 550-196251/1
Matrix: Water
Analysis Batch: 196251

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		20		mg/L			11/22/19 08:51	1

Lab Sample ID: LCS 550-196251/2
Matrix: Water
Analysis Batch: 196251

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Dissolved Solids			1000	969		mg/L		97	90 - 110		

Lab Sample ID: LCSD 550-196251/3
Matrix: Water
Analysis Batch: 196251

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids			1000	906		mg/L		91	90 - 110	7	10

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

Lab Sample ID: 550-133678-1 DU
Matrix: Water
Analysis Batch: 196251

Client Sample ID: FC-CCR-MW49A-111919
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	18000	D2		17600	D2	mg/L				4	10

Lab Sample ID: 550-133678-11 DU
Matrix: Water
Analysis Batch: 196251

Client Sample ID: FC-CCR-MW17R-111919
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	6200	D2		6220	D2	mg/L				0	10

Method: SM 4500 H+ B - pH

Lab Sample ID: LCSSRM 550-196513/1
Matrix: Water
Analysis Batch: 196513

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

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.0		SU		99.6	98.5 - 101.5		

Lab Sample ID: LCSSRM 550-196513/13
Matrix: Water
Analysis Batch: 196513

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

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.0		SU		100.4	98.5 - 101.5		

Lab Sample ID: LCSSRM 550-196513/25
Matrix: Water
Analysis Batch: 196513

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

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.0		SU		100.3	98.5 - 101.5		

Lab Sample ID: 550-133678-1 DU
Matrix: Water
Analysis Batch: 196513

Client Sample ID: FC-CCR-MW49A-111919
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	7.5	H5		7.5	H5	SU				0.1	5
Temperature	9.1	H5		9.1	H5	Degrees C				0	

Lab Sample ID: 550-133678-5 DU
Matrix: Water
Analysis Batch: 196513

Client Sample ID: FC-CCR-MW8-111919
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	7.1	H5		7.1	H5	SU				0.6	5
Temperature	10.1	H5		10.4	H5	Degrees C				3	

Method: SM 4500 H+ B - pH (Continued)

Lab Sample ID: LCSSRM 550-196893/1
Matrix: Water
Analysis Batch: 196893

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

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.0		SU		99.3	98.5 - 101.5

Lab Sample ID: LCSSRM 550-196893/13
Matrix: Water
Analysis Batch: 196893

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

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.0		SU		100.3	98.5 - 101.5

Lab Sample ID: 550-133678-15 DU
Matrix: Water
Analysis Batch: 196893

Client Sample ID: FC-CCR-FD02-111919
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	7.4	H5	7.4	H5	SU		0.1	5
Temperature	7.7	H5	8.0	H5	Degrees C		4	

QC Association Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-133678-1

HPLC/IC

Analysis Batch: 196743

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-133678-1	FC-CCR-MW49A-111919	Total/NA	Water	300.0	
550-133678-1	FC-CCR-MW49A-111919	Total/NA	Water	300.0	
550-133678-2	FC-CCR-MW61-111919	Total/NA	Water	300.0	
550-133678-2	FC-CCR-MW61-111919	Total/NA	Water	300.0	
550-133678-3	FC-CCR-MW75-111919	Total/NA	Water	300.0	
550-133678-3	FC-CCR-MW75-111919	Total/NA	Water	300.0	
550-133678-4	FC-CCR-MW7-111919	Total/NA	Water	300.0	
550-133678-4	FC-CCR-MW7-111919	Total/NA	Water	300.0	
550-133678-4	FC-CCR-MW7-111919	Total/NA	Water	300.0	
550-133678-5	FC-CCR-MW8-111919	Total/NA	Water	300.0	
550-133678-5	FC-CCR-MW8-111919	Total/NA	Water	300.0	
550-133678-5	FC-CCR-MW8-111919	Total/NA	Water	300.0	
550-133678-6	FC-CCR-MW87-111919	Total/NA	Water	300.0	
550-133678-6	FC-CCR-MW87-111919	Total/NA	Water	300.0	
550-133678-7	FC-CCR-MW6-111919	Total/NA	Water	300.0	
550-133678-7	FC-CCR-MW6-111919	Total/NA	Water	300.0	
550-133678-8	FC-CCR-MW38R-111919	Total/NA	Water	300.0	
550-133678-8	FC-CCR-MW38R-111919	Total/NA	Water	300.0	
550-133678-8	FC-CCR-MW38R-111919	Total/NA	Water	300.0	
550-133678-9	FC-CCR-MW57-111919	Total/NA	Water	300.0	
550-133678-9	FC-CCR-MW57-111919	Total/NA	Water	300.0	
550-133678-10	FC-CCR-FD01-111919	Total/NA	Water	300.0	
550-133678-10	FC-CCR-FD01-111919	Total/NA	Water	300.0	
550-133678-11	FC-CCR-MW17R-111919	Total/NA	Water	300.0	
550-133678-11	FC-CCR-MW17R-111919	Total/NA	Water	300.0	
550-133678-12	FC-CCR-MW15-111919	Total/NA	Water	300.0	
550-133678-12	FC-CCR-MW15-111919	Total/NA	Water	300.0	
550-133678-13	FC-CCR-DMX6-111919	Total/NA	Water	300.0	
550-133678-13	FC-CCR-DMX6-111919	Total/NA	Water	300.0	
550-133678-14	FC-CCR-MW16-111919	Total/NA	Water	300.0	
550-133678-14	FC-CCR-MW16-111919	Total/NA	Water	300.0	
550-133678-14	FC-CCR-MW16-111919	Total/NA	Water	300.0	
550-133678-15	FC-CCR-FD02-111919	Total/NA	Water	300.0	
550-133678-15	FC-CCR-FD02-111919	Total/NA	Water	300.0	
550-133678-16	FC-CCR-MW56-111919	Total/NA	Water	300.0	
550-133678-16	FC-CCR-MW56-111919	Total/NA	Water	300.0	
550-133678-17	FC-CCR-DMX4-111919	Total/NA	Water	300.0	
550-133678-17	FC-CCR-DMX4-111919	Total/NA	Water	300.0	
550-133678-17	FC-CCR-DMX4-111919	Total/NA	Water	300.0	
MB 550-196743/2	Method Blank	Total/NA	Water	300.0	
LCS 550-196743/5	Lab Control Sample	Total/NA	Water	300.0	
LCSD 550-196743/6	Lab Control Sample Dup	Total/NA	Water	300.0	
550-133678-1 MS	FC-CCR-MW49A-111919	Total/NA	Water	300.0	
550-133678-1 MS	FC-CCR-MW49A-111919	Total/NA	Water	300.0	
550-133678-1 MSD	FC-CCR-MW49A-111919	Total/NA	Water	300.0	
550-133678-1 MSD	FC-CCR-MW49A-111919	Total/NA	Water	300.0	

Metals

Prep Batch: 196197

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-133678-1	FC-CCR-MW49A-111919	Total/NA	Water	200.8	
550-133678-2	FC-CCR-MW61-111919	Total/NA	Water	200.8	
550-133678-3	FC-CCR-MW75-111919	Total/NA	Water	200.8	
550-133678-4	FC-CCR-MW7-111919	Total/NA	Water	200.8	
550-133678-5	FC-CCR-MW8-111919	Total/NA	Water	200.8	
550-133678-6	FC-CCR-MW87-111919	Total/NA	Water	200.8	
550-133678-7	FC-CCR-MW6-111919	Total/NA	Water	200.8	
550-133678-8	FC-CCR-MW38R-111919	Total/NA	Water	200.8	
550-133678-9	FC-CCR-MW57-111919	Total/NA	Water	200.8	
550-133678-10	FC-CCR-FD01-111919	Total/NA	Water	200.8	
550-133678-11	FC-CCR-MW17R-111919	Total/NA	Water	200.8	
550-133678-12	FC-CCR-MW15-111919	Total/NA	Water	200.8	
550-133678-13	FC-CCR-DMX6-111919	Total/NA	Water	200.8	
550-133678-14	FC-CCR-MW16-111919	Total/NA	Water	200.8	
550-133678-15	FC-CCR-FD02-111919	Total/NA	Water	200.8	
550-133678-16	FC-CCR-MW56-111919	Total/NA	Water	200.8	
550-133678-17	FC-CCR-DMX4-111919	Total/NA	Water	200.8	
MB 550-196197/1-A	Method Blank	Total/NA	Water	200.8	
LCS 550-196197/2-A	Lab Control Sample	Total/NA	Water	200.8	
LCSD 550-196197/3-A	Lab Control Sample Dup	Total/NA	Water	200.8	
550-133678-1 MS	FC-CCR-MW49A-111919	Total/NA	Water	200.8	
550-133678-1 MSD	FC-CCR-MW49A-111919	Total/NA	Water	200.8	

Prep Batch: 196233

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-133678-1	FC-CCR-MW49A-111919	Total/NA	Water	200.7	
550-133678-2	FC-CCR-MW61-111919	Total/NA	Water	200.7	
550-133678-3	FC-CCR-MW75-111919	Total/NA	Water	200.7	
550-133678-4	FC-CCR-MW7-111919	Total/NA	Water	200.7	
550-133678-5	FC-CCR-MW8-111919	Total/NA	Water	200.7	
550-133678-6	FC-CCR-MW87-111919	Total/NA	Water	200.7	
550-133678-7	FC-CCR-MW6-111919	Total/NA	Water	200.7	
550-133678-8	FC-CCR-MW38R-111919	Total/NA	Water	200.7	
550-133678-9	FC-CCR-MW57-111919	Total/NA	Water	200.7	
550-133678-10	FC-CCR-FD01-111919	Total/NA	Water	200.7	
550-133678-11	FC-CCR-MW17R-111919	Total/NA	Water	200.7	
550-133678-12	FC-CCR-MW15-111919	Total/NA	Water	200.7	
550-133678-13	FC-CCR-DMX6-111919	Total/NA	Water	200.7	
550-133678-14	FC-CCR-MW16-111919	Total/NA	Water	200.7	
550-133678-15	FC-CCR-FD02-111919	Total/NA	Water	200.7	
550-133678-16	FC-CCR-MW56-111919	Total/NA	Water	200.7	
550-133678-17	FC-CCR-DMX4-111919	Total/NA	Water	200.7	
MB 550-196233/1-A	Method Blank	Total/NA	Water	200.7	
LCS 550-196233/2-A	Lab Control Sample	Total/NA	Water	200.7	
LCSD 550-196233/3-A	Lab Control Sample Dup	Total/NA	Water	200.7	
550-133678-1 MS	FC-CCR-MW49A-111919	Total/NA	Water	200.7	
550-133678-1 MSD	FC-CCR-MW49A-111919	Total/NA	Water	200.7	

Prep Batch: 196632

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-133678-1	FC-CCR-MW49A-111919	Total/NA	Water	245.1	

Metals (Continued)

Prep Batch: 196632 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-133678-2	FC-CCR-MW61-111919	Total/NA	Water	245.1	
550-133678-3	FC-CCR-MW75-111919	Total/NA	Water	245.1	
550-133678-4	FC-CCR-MW7-111919	Total/NA	Water	245.1	
550-133678-5	FC-CCR-MW8-111919	Total/NA	Water	245.1	
550-133678-6	FC-CCR-MW87-111919	Total/NA	Water	245.1	
550-133678-7	FC-CCR-MW6-111919	Total/NA	Water	245.1	
550-133678-8	FC-CCR-MW38R-111919	Total/NA	Water	245.1	
550-133678-9	FC-CCR-MW57-111919	Total/NA	Water	245.1	
550-133678-10	FC-CCR-FD01-111919	Total/NA	Water	245.1	
550-133678-11	FC-CCR-MW17R-111919	Total/NA	Water	245.1	
550-133678-12	FC-CCR-MW15-111919	Total/NA	Water	245.1	
550-133678-13	FC-CCR-DMX6-111919	Total/NA	Water	245.1	
550-133678-14	FC-CCR-MW16-111919	Total/NA	Water	245.1	
550-133678-15	FC-CCR-FD02-111919	Total/NA	Water	245.1	
550-133678-16	FC-CCR-MW56-111919	Total/NA	Water	245.1	
550-133678-17	FC-CCR-DMX4-111919	Total/NA	Water	245.1	
MB 550-196632/1-A	Method Blank	Total/NA	Water	245.1	
LCS 550-196632/2-A	Lab Control Sample	Total/NA	Water	245.1	
LCSD 550-196632/3-A	Lab Control Sample Dup	Total/NA	Water	245.1	
550-133678-1 MS	FC-CCR-MW49A-111919	Total/NA	Water	245.1	
550-133678-1 MSD	FC-CCR-MW49A-111919	Total/NA	Water	245.1	

Analysis Batch: 196712

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-133678-1	FC-CCR-MW49A-111919	Total/NA	Water	200.7 Rev 4.4	196233
550-133678-2	FC-CCR-MW61-111919	Total/NA	Water	200.7 Rev 4.4	196233
550-133678-3	FC-CCR-MW75-111919	Total/NA	Water	200.7 Rev 4.4	196233
550-133678-4	FC-CCR-MW7-111919	Total/NA	Water	200.7 Rev 4.4	196233
550-133678-5	FC-CCR-MW8-111919	Total/NA	Water	200.7 Rev 4.4	196233
550-133678-6	FC-CCR-MW87-111919	Total/NA	Water	200.7 Rev 4.4	196233
550-133678-7	FC-CCR-MW6-111919	Total/NA	Water	200.7 Rev 4.4	196233
550-133678-8	FC-CCR-MW38R-111919	Total/NA	Water	200.7 Rev 4.4	196233
550-133678-9	FC-CCR-MW57-111919	Total/NA	Water	200.7 Rev 4.4	196233
550-133678-10	FC-CCR-FD01-111919	Total/NA	Water	200.7 Rev 4.4	196233
550-133678-11	FC-CCR-MW17R-111919	Total/NA	Water	200.7 Rev 4.4	196233
550-133678-12	FC-CCR-MW15-111919	Total/NA	Water	200.7 Rev 4.4	196233
550-133678-13	FC-CCR-DMX6-111919	Total/NA	Water	200.7 Rev 4.4	196233
550-133678-14	FC-CCR-MW16-111919	Total/NA	Water	200.7 Rev 4.4	196233
550-133678-15	FC-CCR-FD02-111919	Total/NA	Water	200.7 Rev 4.4	196233
550-133678-16	FC-CCR-MW56-111919	Total/NA	Water	200.7 Rev 4.4	196233
550-133678-17	FC-CCR-DMX4-111919	Total/NA	Water	200.7 Rev 4.4	196233
MB 550-196233/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	196233
LCS 550-196233/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	196233
LCSD 550-196233/3-A	Lab Control Sample Dup	Total/NA	Water	200.7 Rev 4.4	196233
550-133678-1 MS	FC-CCR-MW49A-111919	Total/NA	Water	200.7 Rev 4.4	196233
550-133678-1 MSD	FC-CCR-MW49A-111919	Total/NA	Water	200.7 Rev 4.4	196233

Analysis Batch: 196788

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-133678-1	FC-CCR-MW49A-111919	Total/NA	Water	245.1	196632
550-133678-2	FC-CCR-MW61-111919	Total/NA	Water	245.1	196632

Metals (Continued)

Analysis Batch: 196788 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-133678-3	FC-CCR-MW75-111919	Total/NA	Water	245.1	196632
550-133678-4	FC-CCR-MW7-111919	Total/NA	Water	245.1	196632
550-133678-5	FC-CCR-MW8-111919	Total/NA	Water	245.1	196632
550-133678-6	FC-CCR-MW87-111919	Total/NA	Water	245.1	196632
550-133678-7	FC-CCR-MW6-111919	Total/NA	Water	245.1	196632
550-133678-8	FC-CCR-MW38R-111919	Total/NA	Water	245.1	196632
550-133678-9	FC-CCR-MW57-111919	Total/NA	Water	245.1	196632
550-133678-10	FC-CCR-FD01-111919	Total/NA	Water	245.1	196632
550-133678-11	FC-CCR-MW17R-111919	Total/NA	Water	245.1	196632
550-133678-12	FC-CCR-MW15-111919	Total/NA	Water	245.1	196632
550-133678-13	FC-CCR-DMX6-111919	Total/NA	Water	245.1	196632
550-133678-14	FC-CCR-MW16-111919	Total/NA	Water	245.1	196632
550-133678-15	FC-CCR-FD02-111919	Total/NA	Water	245.1	196632
550-133678-16	FC-CCR-MW56-111919	Total/NA	Water	245.1	196632
550-133678-17	FC-CCR-DMX4-111919	Total/NA	Water	245.1	196632
MB 550-196632/1-A	Method Blank	Total/NA	Water	245.1	196632
LCS 550-196632/2-A	Lab Control Sample	Total/NA	Water	245.1	196632
LCSD 550-196632/3-A	Lab Control Sample Dup	Total/NA	Water	245.1	196632
550-133678-1 MS	FC-CCR-MW49A-111919	Total/NA	Water	245.1	196632
550-133678-1 MSD	FC-CCR-MW49A-111919	Total/NA	Water	245.1	196632

Analysis Batch: 196789

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-133678-1 MS	FC-CCR-MW49A-111919	Total/NA	Water	200.7 Rev 4.4	196233
550-133678-1 MSD	FC-CCR-MW49A-111919	Total/NA	Water	200.7 Rev 4.4	196233

Analysis Batch: 196908

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-133678-1	FC-CCR-MW49A-111919	Total/NA	Water	200.8 LL	196197
550-133678-2	FC-CCR-MW61-111919	Total/NA	Water	200.8 LL	196197
550-133678-3	FC-CCR-MW75-111919	Total/NA	Water	200.8 LL	196197
550-133678-4	FC-CCR-MW7-111919	Total/NA	Water	200.8 LL	196197
550-133678-5	FC-CCR-MW8-111919	Total/NA	Water	200.8 LL	196197
550-133678-6	FC-CCR-MW87-111919	Total/NA	Water	200.8 LL	196197
550-133678-7	FC-CCR-MW6-111919	Total/NA	Water	200.8 LL	196197
550-133678-8	FC-CCR-MW38R-111919	Total/NA	Water	200.8 LL	196197
550-133678-9	FC-CCR-MW57-111919	Total/NA	Water	200.8 LL	196197
550-133678-10	FC-CCR-FD01-111919	Total/NA	Water	200.8 LL	196197
550-133678-11	FC-CCR-MW17R-111919	Total/NA	Water	200.8 LL	196197
550-133678-12	FC-CCR-MW15-111919	Total/NA	Water	200.8 LL	196197
550-133678-13	FC-CCR-DMX6-111919	Total/NA	Water	200.8 LL	196197
550-133678-14	FC-CCR-MW16-111919	Total/NA	Water	200.8 LL	196197
550-133678-15	FC-CCR-FD02-111919	Total/NA	Water	200.8 LL	196197
550-133678-16	FC-CCR-MW56-111919	Total/NA	Water	200.8 LL	196197
550-133678-17	FC-CCR-DMX4-111919	Total/NA	Water	200.8 LL	196197
MB 550-196197/1-A	Method Blank	Total/NA	Water	200.8 LL	196197
LCS 550-196197/2-A	Lab Control Sample	Total/NA	Water	200.8 LL	196197
LCSD 550-196197/3-A	Lab Control Sample Dup	Total/NA	Water	200.8 LL	196197
550-133678-1 MS	FC-CCR-MW49A-111919	Total/NA	Water	200.8 LL	196197
550-133678-1 MSD	FC-CCR-MW49A-111919	Total/NA	Water	200.8 LL	196197

QC Association Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-133678-1

Metals

Analysis Batch: 197144

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-133678-1	FC-CCR-MW49A-111919	Total/NA	Water	200.8 LL	196197
550-133678-2	FC-CCR-MW61-111919	Total/NA	Water	200.8 LL	196197
550-133678-3	FC-CCR-MW75-111919	Total/NA	Water	200.8 LL	196197
550-133678-4	FC-CCR-MW7-111919	Total/NA	Water	200.8 LL	196197
MB 550-196197/1-A	Method Blank	Total/NA	Water	200.8 LL	196197
LCS 550-196197/2-A	Lab Control Sample	Total/NA	Water	200.8 LL	196197
LCSD 550-196197/3-A	Lab Control Sample Dup	Total/NA	Water	200.8 LL	196197
550-133678-1 MS	FC-CCR-MW49A-111919	Total/NA	Water	200.8 LL	196197
550-133678-1 MSD	FC-CCR-MW49A-111919	Total/NA	Water	200.8 LL	196197

Analysis Batch: 198020

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-133678-8	FC-CCR-MW38R-111919	Total/NA	Water	200.8 LL	196197
550-133678-10	FC-CCR-FD01-111919	Total/NA	Water	200.8 LL	196197
550-133678-16	FC-CCR-MW56-111919	Total/NA	Water	200.8 LL	196197
550-133678-17	FC-CCR-DMX4-111919	Total/NA	Water	200.8 LL	196197

Analysis Batch: 198101

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-133678-5	FC-CCR-MW8-111919	Total/NA	Water	200.8 LL	196197
550-133678-7	FC-CCR-MW6-111919	Total/NA	Water	200.8 LL	196197
550-133678-9	FC-CCR-MW57-111919	Total/NA	Water	200.8 LL	196197
550-133678-11	FC-CCR-MW17R-111919	Total/NA	Water	200.8 LL	196197
550-133678-12	FC-CCR-MW15-111919	Total/NA	Water	200.8 LL	196197
550-133678-13	FC-CCR-DMX6-111919	Total/NA	Water	200.8 LL	196197
550-133678-14	FC-CCR-MW16-111919	Total/NA	Water	200.8 LL	196197
550-133678-15	FC-CCR-FD02-111919	Total/NA	Water	200.8 LL	196197

Analysis Batch: 198314

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-133678-6	FC-CCR-MW87-111919	Total/NA	Water	200.8 LL	196197

General Chemistry

Analysis Batch: 196251

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-133678-1	FC-CCR-MW49A-111919	Total/NA	Water	SM 2540C	
550-133678-2	FC-CCR-MW61-111919	Total/NA	Water	SM 2540C	
550-133678-3	FC-CCR-MW75-111919	Total/NA	Water	SM 2540C	
550-133678-4	FC-CCR-MW7-111919	Total/NA	Water	SM 2540C	
550-133678-5	FC-CCR-MW8-111919	Total/NA	Water	SM 2540C	
550-133678-6	FC-CCR-MW87-111919	Total/NA	Water	SM 2540C	
550-133678-7	FC-CCR-MW6-111919	Total/NA	Water	SM 2540C	
550-133678-8	FC-CCR-MW38R-111919	Total/NA	Water	SM 2540C	
550-133678-9	FC-CCR-MW57-111919	Total/NA	Water	SM 2540C	
550-133678-10	FC-CCR-FD01-111919	Total/NA	Water	SM 2540C	
550-133678-11	FC-CCR-MW17R-111919	Total/NA	Water	SM 2540C	
550-133678-12	FC-CCR-MW15-111919	Total/NA	Water	SM 2540C	
550-133678-13	FC-CCR-DMX6-111919	Total/NA	Water	SM 2540C	
550-133678-14	FC-CCR-MW16-111919	Total/NA	Water	SM 2540C	
550-133678-15	FC-CCR-FD02-111919	Total/NA	Water	SM 2540C	

General Chemistry (Continued)

Analysis Batch: 196251 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-133678-16	FC-CCR-MW56-111919	Total/NA	Water	SM 2540C	
550-133678-17	FC-CCR-DMX4-111919	Total/NA	Water	SM 2540C	
MB 550-196251/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 550-196251/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 550-196251/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	
550-133678-1 DU	FC-CCR-MW49A-111919	Total/NA	Water	SM 2540C	
550-133678-11 DU	FC-CCR-MW17R-111919	Total/NA	Water	SM 2540C	

Analysis Batch: 196513

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-133678-1	FC-CCR-MW49A-111919	Total/NA	Water	SM 4500 H+ B	
550-133678-2	FC-CCR-MW61-111919	Total/NA	Water	SM 4500 H+ B	
550-133678-3	FC-CCR-MW75-111919	Total/NA	Water	SM 4500 H+ B	
550-133678-4	FC-CCR-MW7-111919	Total/NA	Water	SM 4500 H+ B	
550-133678-5	FC-CCR-MW8-111919	Total/NA	Water	SM 4500 H+ B	
550-133678-6	FC-CCR-MW87-111919	Total/NA	Water	SM 4500 H+ B	
550-133678-7	FC-CCR-MW6-111919	Total/NA	Water	SM 4500 H+ B	
550-133678-8	FC-CCR-MW38R-111919	Total/NA	Water	SM 4500 H+ B	
550-133678-9	FC-CCR-MW57-111919	Total/NA	Water	SM 4500 H+ B	
550-133678-10	FC-CCR-FD01-111919	Total/NA	Water	SM 4500 H+ B	
550-133678-11	FC-CCR-MW17R-111919	Total/NA	Water	SM 4500 H+ B	
550-133678-12	FC-CCR-MW15-111919	Total/NA	Water	SM 4500 H+ B	
550-133678-13	FC-CCR-DMX6-111919	Total/NA	Water	SM 4500 H+ B	
550-133678-14	FC-CCR-MW16-111919	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-196513/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-196513/13	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-196513/25	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
550-133678-1 DU	FC-CCR-MW49A-111919	Total/NA	Water	SM 4500 H+ B	
550-133678-5 DU	FC-CCR-MW8-111919	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 196893

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-133678-15	FC-CCR-FD02-111919	Total/NA	Water	SM 4500 H+ B	
550-133678-16	FC-CCR-MW56-111919	Total/NA	Water	SM 4500 H+ B	
550-133678-17	FC-CCR-DMX4-111919	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-196893/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-196893/13	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
550-133678-15 DU	FC-CCR-FD02-111919	Total/NA	Water	SM 4500 H+ B	

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-133678-1

Client Sample ID: FC-CCR-MW49A-111919

Lab Sample ID: 550-133678-1

Date Collected: 11/19/19 08:07

Matrix: Water

Date Received: 11/21/19 11:23

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	196743	11/26/19 19:06	NEL	TAL PHX
Total/NA	Analysis	300.0		200	196743	11/26/19 20:01	NEL	TAL PHX
Total/NA	Prep	200.7			196233	11/22/19 06:02	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	196712	11/27/19 04:40	SRA	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		1	196908	11/29/19 20:44	ARE	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		2	197144	12/03/19 14:03	ARE	TAL PHX
Total/NA	Prep	245.1			196632	11/26/19 10:00	BCV	TAL PHX
Total/NA	Analysis	245.1		1	196788	11/27/19 13:47	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	196251		YET	TAL PHX
					(Start)	11/22/19 08:51		
					(End)	11/25/19 14:05		
Total/NA	Analysis	SM 4500 H+ B		1	196513	11/25/19 18:45	MRR	TAL PHX

Client Sample ID: FC-CCR-MW61-111919

Lab Sample ID: 550-133678-2

Date Collected: 11/19/19 09:38

Matrix: Water

Date Received: 11/21/19 11:23

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	196743	11/26/19 20:56	NEL	TAL PHX
Total/NA	Analysis	300.0		50	196743	11/26/19 21:15	NEL	TAL PHX
Total/NA	Prep	200.7			196233	11/22/19 06:02	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	196712	11/27/19 04:43	SRA	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		1	196908	11/29/19 20:46	ARE	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		1	197144	12/03/19 14:05	ARE	TAL PHX
Total/NA	Prep	245.1			196632	11/26/19 10:00	BCV	TAL PHX
Total/NA	Analysis	245.1		1	196788	11/27/19 13:53	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	196251		YET	TAL PHX
					(Start)	11/22/19 08:51		
					(End)	11/25/19 14:05		
Total/NA	Analysis	SM 4500 H+ B		1	196513	11/25/19 18:45	MRR	TAL PHX

Client Sample ID: FC-CCR-MW75-111919

Lab Sample ID: 550-133678-3

Date Collected: 11/19/19 10:15

Matrix: Water

Date Received: 11/21/19 11:23

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	196743	11/26/19 21:33	NEL	TAL PHX
Total/NA	Analysis	300.0		50	196743	11/26/19 21:52	NEL	TAL PHX
Total/NA	Prep	200.7			196233	11/22/19 06:02	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	196712	11/27/19 04:47	SRA	TAL PHX

Client Sample ID: FC-CCR-MW75-111919

Lab Sample ID: 550-133678-3

Date Collected: 11/19/19 10:15

Matrix: Water

Date Received: 11/21/19 11:23

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		1	196908	11/29/19 20:49	ARE	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		1	197144	12/03/19 14:07	ARE	TAL PHX
Total/NA	Prep	245.1			196632	11/26/19 10:00	BCV	TAL PHX
Total/NA	Analysis	245.1		1	196788	11/27/19 13:55	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	196251		YET	TAL PHX
					(Start)	11/22/19 08:51		
					(End)	11/25/19 14:05		
Total/NA	Analysis	SM 4500 H+ B		1	196513	11/25/19 18:45	MRR	TAL PHX

Client Sample ID: FC-CCR-MW7-111919

Lab Sample ID: 550-133678-4

Date Collected: 11/19/19 11:56

Matrix: Water

Date Received: 11/21/19 11:23

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	196743	11/26/19 22:47	NEL	TAL PHX
Total/NA	Analysis	300.0		50	196743	11/26/19 23:05	NEL	TAL PHX
Total/NA	Analysis	300.0		100	196743	11/27/19 15:10	NEL	TAL PHX
Total/NA	Prep	200.7			196233	11/22/19 06:02	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	196712	11/27/19 04:50	SRA	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		1	196908	11/29/19 20:51	ARE	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		1	197144	12/03/19 14:09	ARE	TAL PHX
Total/NA	Prep	245.1			196632	11/26/19 10:00	BCV	TAL PHX
Total/NA	Analysis	245.1		1	196788	11/27/19 13:56	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	196251		YET	TAL PHX
					(Start)	11/22/19 08:51		
					(End)	11/25/19 14:05		
Total/NA	Analysis	SM 4500 H+ B		1	196513	11/25/19 18:45	MRR	TAL PHX

Client Sample ID: FC-CCR-MW8-111919

Lab Sample ID: 550-133678-5

Date Collected: 11/19/19 12:29

Matrix: Water

Date Received: 11/21/19 11:23

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	196743	11/26/19 23:24	NEL	TAL PHX
Total/NA	Analysis	300.0		50	196743	11/26/19 23:42	NEL	TAL PHX
Total/NA	Analysis	300.0		100	196743	11/27/19 15:28	NEL	TAL PHX
Total/NA	Prep	200.7			196233	11/22/19 06:02	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	196712	11/27/19 04:54	SRA	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		1	196908	11/29/19 20:53	ARE	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-133678-1

Client Sample ID: FC-CCR-MW8-111919
Date Collected: 11/19/19 12:29
Date Received: 11/21/19 11:23

Lab Sample ID: 550-133678-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		2	198101	12/16/19 12:00	ARE	TAL PHX
Total/NA	Prep	245.1			196632	11/26/19 10:00	BCV	TAL PHX
Total/NA	Analysis	245.1		1	196788	11/27/19 13:58	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	196251		YET	TAL PHX
					(Start)	11/22/19 08:51		
					(End)	11/25/19 14:05		
Total/NA	Analysis	SM 4500 H+ B		1	196513	11/25/19 18:45	MRR	TAL PHX

Client Sample ID: FC-CCR-MW87-111919
Date Collected: 11/19/19 17:25
Date Received: 11/21/19 11:23

Lab Sample ID: 550-133678-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	196743	11/27/19 00:00	NEL	TAL PHX
Total/NA	Analysis	300.0		200	196743	11/27/19 00:19	NEL	TAL PHX
Total/NA	Prep	200.7			196233	11/22/19 06:02	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	196712	11/27/19 04:58	SRA	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		1	196908	11/29/19 20:55	ARE	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		2	198314	12/18/19 09:39	ARE	TAL PHX
Total/NA	Prep	245.1			196632	11/26/19 10:00	BCV	TAL PHX
Total/NA	Analysis	245.1		1	196788	11/27/19 13:59	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	196251		YET	TAL PHX
					(Start)	11/22/19 08:51		
					(End)	11/25/19 14:05		
Total/NA	Analysis	SM 4500 H+ B		1	196513	11/25/19 18:45	MRR	TAL PHX

Client Sample ID: FC-CCR-MW6-111919
Date Collected: 11/19/19 15:43
Date Received: 11/21/19 11:23

Lab Sample ID: 550-133678-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		500	196743	11/27/19 00:56	NEL	TAL PHX
Total/NA	Analysis	300.0		2	196743	11/27/19 15:46	NEL	TAL PHX
Total/NA	Prep	200.7			196233	11/22/19 06:02	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	196712	11/27/19 05:01	SRA	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		1	196908	11/29/19 20:57	ARE	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		2	198101	12/16/19 12:02	ARE	TAL PHX
Total/NA	Prep	245.1			196632	11/26/19 10:00	BCV	TAL PHX
Total/NA	Analysis	245.1		1	196788	11/27/19 14:01	BCV	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-133678-1

Client Sample ID: FC-CCR-MW6-111919

Lab Sample ID: 550-133678-7

Date Collected: 11/19/19 15:43
Matrix: Water
Date Received: 11/21/19 11:23

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540C		1	196251		YET	TAL PHX
Total/NA	Analysis	SM 4500 H+ B		1	196513	11/25/19 18:45	MRR	TAL PHX

Client Sample ID: FC-CCR-MW38R-111919

Lab Sample ID: 550-133678-8

Date Collected: 11/19/19 13:09
Matrix: Water
Date Received: 11/21/19 11:23

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	196743	11/27/19 01:14	NEL	TAL PHX
Total/NA	Analysis	300.0		200	196743	11/27/19 01:32	NEL	TAL PHX
Total/NA	Analysis	300.0		50	196743	11/27/19 16:05	NEL	TAL PHX
Total/NA	Prep	200.7			196233	11/22/19 06:02	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	196712	11/27/19 05:05	SRA	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		1	196908	11/29/19 21:03	ARE	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		1	198020	12/15/19 02:27	SRA	TAL PHX
Total/NA	Prep	245.1			196632	11/26/19 10:00	BCV	TAL PHX
Total/NA	Analysis	245.1		1	196788	11/27/19 14:05	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	196251		YET	TAL PHX
					(Start)	11/22/19 08:51		
					(End)	11/25/19 14:05		
Total/NA	Analysis	SM 4500 H+ B		1	196513	11/25/19 18:45	MRR	TAL PHX

Client Sample ID: FC-CCR-MW57-111919

Lab Sample ID: 550-133678-9

Date Collected: 11/19/19 13:50
Matrix: Water
Date Received: 11/21/19 11:23

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	196743	11/27/19 02:28	NEL	TAL PHX
Total/NA	Analysis	300.0		100	196743	11/27/19 02:46	NEL	TAL PHX
Total/NA	Prep	200.7			196233	11/22/19 06:02	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	196712	11/27/19 05:08	SRA	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		1	196908	11/29/19 21:05	ARE	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		2	198101	12/16/19 12:04	ARE	TAL PHX
Total/NA	Prep	245.1			196632	11/26/19 10:00	BCV	TAL PHX
Total/NA	Analysis	245.1		1	196788	11/27/19 14:07	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	196251		YET	TAL PHX
					(Start)	11/22/19 08:51		
					(End)	11/25/19 14:05		
Total/NA	Analysis	SM 4500 H+ B		1	196513	11/25/19 18:45	MRR	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-133678-1

Client Sample ID: FC-CCR-FD01-111919

Lab Sample ID: 550-133678-10

Date Collected: 11/19/19 13:09

Matrix: Water

Date Received: 11/21/19 11:23

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	196743	11/27/19 03:04	NEL	TAL PHX
Total/NA	Analysis	300.0		100	196743	11/27/19 03:23	NEL	TAL PHX
Total/NA	Prep	200.7			196233	11/22/19 06:02	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	196712	11/27/19 05:18	SRA	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		1	196908	11/29/19 21:07	ARE	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		1	198020	12/15/19 02:31	SRA	TAL PHX
Total/NA	Prep	245.1			196632	11/26/19 10:00	BCV	TAL PHX
Total/NA	Analysis	245.1		1	196788	11/27/19 14:08	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	196251		YET	TAL PHX
					(Start)	11/22/19 08:51		
					(End)	11/25/19 14:05		
Total/NA	Analysis	SM 4500 H+ B		1	196513	11/25/19 18:45	MRR	TAL PHX

Client Sample ID: FC-CCR-MW17R-111919

Lab Sample ID: 550-133678-11

Date Collected: 11/19/19 14:28

Matrix: Water

Date Received: 11/21/19 11:23

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	196743	11/27/19 03:41	NEL	TAL PHX
Total/NA	Analysis	300.0		100	196743	11/27/19 04:00	NEL	TAL PHX
Total/NA	Prep	200.7			196233	11/22/19 06:02	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	196712	11/27/19 05:21	SRA	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		1	196908	11/29/19 21:09	ARE	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		2	198101	12/16/19 12:06	ARE	TAL PHX
Total/NA	Prep	245.1			196632	11/26/19 10:00	BCV	TAL PHX
Total/NA	Analysis	245.1		1	196788	11/27/19 14:10	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	196251		YET	TAL PHX
					(Start)	11/22/19 08:51		
					(End)	11/25/19 14:05		
Total/NA	Analysis	SM 4500 H+ B		1	196513	11/25/19 18:45	MRR	TAL PHX

Client Sample ID: FC-CCR-MW15-111919

Lab Sample ID: 550-133678-12

Date Collected: 11/19/19 18:46

Matrix: Water

Date Received: 11/21/19 11:23

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	196743	11/27/19 04:18	NEL	TAL PHX
Total/NA	Analysis	300.0		100	196743	11/27/19 04:36	NEL	TAL PHX
Total/NA	Prep	200.7			196233	11/22/19 06:02	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	196712	11/27/19 05:25	SRA	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-133678-1

Client Sample ID: FC-CCR-MW15-111919

Lab Sample ID: 550-133678-12

Date Collected: 11/19/19 18:46

Matrix: Water

Date Received: 11/21/19 11:23

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		1	196908	11/29/19 21:12	ARE	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		2	198101	12/16/19 12:08	ARE	TAL PHX
Total/NA	Prep	245.1			196632	11/26/19 10:00	BCV	TAL PHX
Total/NA	Analysis	245.1		1	196788	11/27/19 14:11	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	196251		YET	TAL PHX
					(Start)	11/22/19 08:51		
					(End)	11/25/19 14:05		
Total/NA	Analysis	SM 4500 H+ B		1	196513	11/25/19 18:45	MRR	TAL PHX

Client Sample ID: FC-CCR-DMX6-111919

Lab Sample ID: 550-133678-13

Date Collected: 11/19/19 18:11

Matrix: Water

Date Received: 11/21/19 11:23

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	196743	11/27/19 04:55	NEL	TAL PHX
Total/NA	Analysis	300.0		100	196743	11/27/19 05:13	NEL	TAL PHX
Total/NA	Prep	200.7			196233	11/22/19 06:02	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	196712	11/27/19 05:28	SRA	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		1	196908	11/29/19 21:14	ARE	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		2	198101	12/16/19 12:10	ARE	TAL PHX
Total/NA	Prep	245.1			196632	11/26/19 10:00	BCV	TAL PHX
Total/NA	Analysis	245.1		1	196788	11/27/19 14:13	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	196251		YET	TAL PHX
					(Start)	11/22/19 08:51		
					(End)	11/25/19 14:05		
Total/NA	Analysis	SM 4500 H+ B		1	196513	11/25/19 18:45	MRR	TAL PHX

Client Sample ID: FC-CCR-MW16-111919

Lab Sample ID: 550-133678-14

Date Collected: 11/19/19 19:31

Matrix: Water

Date Received: 11/21/19 11:23

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	196743	11/27/19 06:08	NEL	TAL PHX
Total/NA	Analysis	300.0		100	196743	11/27/19 06:27	NEL	TAL PHX
Total/NA	Analysis	300.0		200	196743	11/27/19 16:23	NEL	TAL PHX
Total/NA	Prep	200.7			196233	11/22/19 06:02	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	196712	11/27/19 05:32	SRA	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		1	196908	11/29/19 21:16	ARE	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-133678-1

Client Sample ID: FC-CCR-MW16-111919

Lab Sample ID: 550-133678-14

Date Collected: 11/19/19 19:31

Matrix: Water

Date Received: 11/21/19 11:23

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		2	198101	12/16/19 12:12	ARE	TAL PHX
Total/NA	Prep	245.1			196632	11/26/19 10:00	BCV	TAL PHX
Total/NA	Analysis	245.1		1	196788	11/27/19 14:14	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	196251		YET	TAL PHX
					(Start)	11/22/19 08:51		
					(End)	11/25/19 14:05		
Total/NA	Analysis	SM 4500 H+ B		1	196513	11/25/19 18:45	MRR	TAL PHX

Client Sample ID: FC-CCR-FD02-111919

Lab Sample ID: 550-133678-15

Date Collected: 11/19/19 17:25

Matrix: Water

Date Received: 11/21/19 11:23

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	196743	11/27/19 06:45	NEL	TAL PHX
Total/NA	Analysis	300.0		200	196743	11/27/19 07:04	NEL	TAL PHX
Total/NA	Prep	200.7			196233	11/22/19 06:02	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	196712	11/27/19 05:36	SRA	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		1	196908	11/29/19 21:18	ARE	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		2	198101	12/16/19 12:15	ARE	TAL PHX
Total/NA	Prep	245.1			196632	11/26/19 10:00	BCV	TAL PHX
Total/NA	Analysis	245.1		1	196788	11/27/19 14:16	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	196251		YET	TAL PHX
					(Start)	11/22/19 08:51		
					(End)	11/25/19 14:05		
Total/NA	Analysis	SM 4500 H+ B		1	196893	11/29/19 16:35	MRR	TAL PHX

Client Sample ID: FC-CCR-MW56-111919

Lab Sample ID: 550-133678-16

Date Collected: 11/19/19 15:01

Matrix: Water

Date Received: 11/21/19 11:23

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	196743	11/27/19 07:22	NEL	TAL PHX
Total/NA	Analysis	300.0		200	196743	11/27/19 07:40	NEL	TAL PHX
Total/NA	Prep	200.7			196233	11/22/19 06:02	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	196712	11/27/19 05:39	SRA	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		1	196908	11/29/19 21:20	ARE	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		1	198020	12/15/19 02:47	SRA	TAL PHX
Total/NA	Prep	245.1			196632	11/26/19 10:00	BCV	TAL PHX
Total/NA	Analysis	245.1		1	196788	11/27/19 14:17	BCV	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-133678-1

Client Sample ID: FC-CCR-MW56-111919

Lab Sample ID: 550-133678-16

Date Collected: 11/19/19 15:01

Matrix: Water

Date Received: 11/21/19 11:23

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540C		1	196251		YET	TAL PHX
Total/NA	Analysis	SM 4500 H+ B		1	196893	11/29/19 16:35	MRR	TAL PHX

Client Sample ID: FC-CCR-DMX4-111919

Lab Sample ID: 550-133678-17

Date Collected: 11/19/19 16:34

Matrix: Water

Date Received: 11/21/19 11:23

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	196743	11/27/19 07:59	NEL	TAL PHX
Total/NA	Analysis	300.0		50	196743	11/27/19 08:17	NEL	TAL PHX
Total/NA	Analysis	300.0		100	196743	11/27/19 16:42	NEL	TAL PHX
Total/NA	Prep	200.7			196233	11/22/19 06:02	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	196712	11/27/19 05:43	SRA	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		1	196908	11/29/19 21:22	ARE	TAL PHX
Total/NA	Prep	200.8			196197	11/21/19 15:26	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		1	198020	12/15/19 02:49	SRA	TAL PHX
Total/NA	Prep	245.1			196632	11/26/19 10:00	BCV	TAL PHX
Total/NA	Analysis	245.1		1	196788	11/27/19 14:19	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	196251		YET	TAL PHX
					(Start)	11/22/19 08:51		
					(End)	11/25/19 14:05		
Total/NA	Analysis	SM 4500 H+ B		1	196893	11/29/19 16:35	MRR	TAL PHX

Laboratory References:

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

Accreditation/Certification Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-133678-1

Laboratory: Eurofins TestAmerica, Phoenix

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

Authority	Program	Identification Number	Expiration Date
Arizona	State Program	AZ0728	06-09-20

Method Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-133678-1

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL PHX
200.7 Rev 4.4	Metals (ICP)	40CFR136A	TAL PHX
200.8 LL	Metals (ICP/MS)	EPA	TAL PHX
245.1	Mercury (CVAA)	EPA	TAL PHX
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PHX
SM 4500 H+ B	pH	SM	TAL PHX
200.7	Preparation, Total Metals	EPA	TAL PHX
200.8	Preparation, Total Metals	EPA	TAL PHX
245.1	Preparation, Mercury	EPA	TAL PHX

Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.
EPA = US Environmental Protection Agency
MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
SM = "Standard Methods For The Examination Of Water And Wastewater"

Laboratory References:

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

Chain of Custody Record 372523

eurofins | Environment Testing TestAmerica

12/19/2019

Address: _____ 133678

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

TAL-8210

Client Contact	Project Manager: Jim Edwards	Site Contact: Jim Edwards	Date:	COC No:
Company Name: APS Four Corners	Tel/Email: 928-386-0302	Lab Contact: Ken Baker	Carrier:	1 of 2 COCs
Address: P.O. Box 355, MS 4915	Analysis Turnaround Time			Sampler:
City/State/Zip: Fruitland, NM 87416	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone:	TAT if different from Below _____			Walk-in Client:
Fax:	☐ 2 weeks			
Project Name: CCR	☐ 1 week			
Site:	☐ 2 days			
P O #	☐ 1 day			

550-133678 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	EPA 2007 (B, Ca, Li)	200.8 (Sb, As, Ba, Ca, Cr, Co, Pb, Mo, Se, Tl)	EPA 300.0 (Cl, F, SO4)	SM4500-H B (pH)	SM2540C (TDS)	EPA 245.1 (Hg)	Sample Specific Notes:
FC-CCR-MW49A-111919	11/19/19	08:07	G	W		N	N	X	X	X	X	X	X	Low flow
FC-CCR-MW61-111919	11/19/19	09:38						X	X	X	X	X	X	
FC-CCR-MW75-111919	11/19/19	10:15						X	X	X	X	X	X	
FC-CCR-MW7-111919	11/19/19	11:56						X	X	X	X	X	X	
FC-CCR-MW8-111919	11/19/19	12:29						X	X	X	X	X	X	
FC-CCR-MW87-111919	11/19/19	17:25						X	X	X	X	X	X	
FC-CCR-MW6-111919	11/19/19	15:43						X	X	X	X	X	X	
FC-CCR-MW38R-111919	11/19/19	13:09						X	X	X	X	X	X	
FC-CCR-MW57-111919	11/19/19	13:50						X	X	X	X	X	X	
FC-CCR-FD01-111919	11/19/19	13:09						X	X	X	X	X	X	
FC-CCR-MW17R-111919	11/19/19	14:28						X	X	X	X	X	X	
~~FC-CCR-~~														

-01 -02 -03 -04 -05 -06 -07 -08 -09 -10 -11

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

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

☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:

(1.1°C, 1.9°C) CD

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: _____ Corr'd: _____ Therm ID No.: _____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Isaac Torres	Wood	11/21/19 11:23			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company: TAKC	Date/Time: 11-21-19 11:23

TestAmerica Phoenix
4645 E Cotton Ctr Blvd Bdg 3
Phoenix, AZ 85040
phone 602.437.3340 fax 623.445.6192

Chain of Custody Record

133678

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Jim Edwards	Site Contact: Jim Edwards	Date:	COC No:
APS Four Corners	Tel/Fax: 928-386-0302	Lab Contact: Ken Baker	Carrier:	2 of 2 COCs
PO Box 355, MS 4915	Analysis Turnaround Time			Job No.
Fruitland, NM 87416	Calendar (C) or Work Days (W) _____			
Phone:	TAT if different from Below 7 Days			SDG No.
Fax:	☐ 2 weeks			
Project Name: CCR	☐ 1 week			
E-Mail Address:	☐ 2 days			
	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	Perform MS / MSD (Y / N)	EPA 200.7 (B, Be, Ca, Li)	200.8 (Sb, As, Ba, Cd, Cr, Co, Pb, Mo, Se, Tl)	EPA 300.0 (Cl, F, SO4)	SM 4500-HB (pH)	SM 2540C (TDS)	EPA 245.1 (Hg)	Sample Specific Notes:
FC-CCR-MW15- 111919	11/19/19	18:46	G	W		N		X	X	X	X	X	X	-12
FC-CCR-DMX6- 111919	11/19/19	18:11	G	W		N		X	X	X	X	X	X	-13
FC-CCR-MW16- 111919	11/19/19	19:31	G	W		N		X	X	X	X	X	X	-14
FC-CCR-FD02- 111919	11/19/19	17:25	G	W		N		X	X	X	X	X	X	-15
FC-CCR-MW56- 111919	11/19/19	15:01	G	W		N		X	X	X	X	X	X	-16
FC-CCR-DMX4- 111919	11/19/19	16:34	G	W		N		X	X	X	X	X	X	-17

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Special Instructions/QC Requirements & Comments:
Method 200.8 with collision cell

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Isaac Torres	Wood	11/21/19 11:23			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company: TAPK2	Date/Time: 11-21-19 1123

12/19/2019

Login Sample Receipt Checklist

Client: Arizona Public Service Company

Job Number: 550-133678-1

Login Number: 133678
List Number: 1
Creator: Gravlin, Andrea

List Source: Eurofins TestAmerica, Phoenix

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

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ANALYTICAL REPORT

Eurofins TestAmerica, Phoenix
4625 East Cotton Ctr Blvd
Suite 189
Phoenix, AZ 85040
Tel: (602)437-3340

Laboratory Job ID: 550-134494-1
Client Project/Site: CCR

For:
Arizona Public Service Company
PO BOX 188, Ste. 4458
Joseph City, Arizona 86032

Attn: Jim Edwards

Authorized for release by:
1/7/2020 10:21:09 AM

Ken Baker, Project Manager II
(602)659-7624
ken.baker@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

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

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

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Definitions/Glossary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-134494-1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
D1	Sample required dilution due to matrix.
D2	Sample required dilution due to high concentration of analyte.
D5	Minimum Reporting Limit (MRL) adjusted due to sample dilution; analyte was non-detect in the sample.

Metals

Qualifier	Qualifier Description
B3	Target analyte detected in calibration blank at or above the method reporting limit.
D1	Sample required dilution due to matrix.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated blank spike was acceptable.

General Chemistry

Qualifier	Qualifier Description
D2	Sample required dilution due to high concentration of analyte.
H1	Sample analysis performed past holding time.
H5	This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.

Glossary

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

Job ID: 550-134494-1

Laboratory: Eurofins TestAmerica, Phoenix

Narrative

Job Narrative
550-134494-1

Comments
No additional comments.

Receipt
The samples were received on 12/9/2019 10:20 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.0º C and 2.6º C.

HPLC/IC
Method 300.0: The following sample were diluted for Fluoride by method EPA 300.0 due to the nature of their sample matrix: FC-CCR-MW71-120219 (550-134494-6), FC-CCR-MW72-120219 (550-134494-7), FC-CCR-MW73-120219 (550-134494-8), FC-CCR-FD01-120219 (550-134494-10), FC-CCR-MW84-120319 (550-134494-11), FC-CCR-MW85-120319 (550-134494-12) and FC-CCR-MW86-120319 (550-134494-13). This analyte was not detected in the diluted samples, As such, elevated reporting limits (RLs) have been provided and these data have been qualified.

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

Metals
Method 200.7 Rev 4.4: The continuing calibration blank (CCB) for analytical batch 550-198848 contained boron above the reporting limit (RL). All reported samples associated with this CCB were either ND for this analyte or contained this analyte at a concentration greater than 10X the value found in the CCB; therefore, re-analysis of samples was not performed.

Method 200.7 Rev 4.4: The continuing calibration blank (CCB) for analytical batch 550-198600 contained boron above the reporting limit (RL). All reported samples associated with this CCB were either ND for this analyte or contained this analyte at a concentration greater than 10X the value found in the CCB; therefore, re-analysis of samples was not performed.

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

General Chemistry
Method SM 2540C: The following samples were received with less than 2 days remaining on the holding time or less than one shift (8 hours) remaining on a test with a holding time of 48 hours or less. As such, the laboratory had insufficient time remaining to perform the analysis within holding time: FC-CCR-MW71-120219 (550-134494-6), FC-CCR-MW71-120219 (550-134494-6[DU]), FC-CCR-MW72-120219 (550-134494-7), FC-CCR-MW73-120219 (550-134494-8), FC-CCR-MW83-120319 (550-134494-9) and FC-CCR-FD01-120219 (550-134494-10).

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

Sample Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-134494-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
550-134494-1	FC-CCR-MW66-120319	Water	12/03/19 14:45	12/09/19 10:20	
550-134494-2	FC-CCR-MW67-120219	Water	12/03/19 18:59	12/09/19 10:20	
550-134494-3	FC-CCR-MW68-120219	Water	12/03/19 17:31	12/09/19 10:20	
550-134494-4	FC-CCR-MW69-120219	Water	12/03/19 16:50	12/09/19 10:20	
550-134494-5	FC-CCR-MW70-120319	Water	12/03/19 15:45	12/09/19 10:20	
550-134494-6	FC-CCR-MW71-120219	Water	12/02/19 15:06	12/09/19 10:20	
550-134494-7	FC-CCR-MW72-120219	Water	12/02/19 16:02	12/09/19 10:20	
550-134494-8	FC-CCR-MW73-120219	Water	12/02/19 14:08	12/09/19 10:20	
550-134494-9	FC-CCR-MW83-120319	Water	12/02/19 09:52	12/09/19 10:20	
550-134494-10	FC-CCR-FD01-120219	Water	12/02/19 14:08	12/09/19 10:20	
550-134494-11	FC-CCR-MW84-120319	Water	12/03/19 07:57	12/09/19 10:20	
550-134494-12	FC-CCR-MW85-120319	Water	12/03/19 08:47	12/09/19 10:20	
550-134494-13	FC-CCR-MW86-120319	Water	12/03/19 13:56	12/09/19 10:20	
550-134494-14	FC-CCR-FD02-120319	Water	12/03/19 14:45	12/09/19 10:20	

Detection Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-134494-1

Client Sample ID: FC-CCR-MW66-120319 — Lab Sample ID: 550-134494-1

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	1800	D2	400		mg/L	200		300.0	Total/NA
Fluoride	22	D1	0.80		mg/L	2		300.0	Total/NA
Sulfate	12000	D2	400		mg/L	200		300.0	Total/NA
Boron	130	B3	0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	430		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.32		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.024	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Cobalt	0.012	D1	0.0020		mg/L	4		200.8 LL	Total/NA
Molybdenum	0.023	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Thallium	0.0010	D1	0.00020		mg/L	2		200.8 LL	Total/NA
Total Dissolved Solids	19000	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.2	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW67-120219 — Lab Sample ID: 550-134494-2

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	1900	D2	400		mg/L	200		300.0	Total/NA
Fluoride	14	D1	0.80		mg/L	2		300.0	Total/NA
Sulfate	13000	D2	400		mg/L	200		300.0	Total/NA
Boron	150	B3	0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	450		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.37		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0035	D1	0.0020		mg/L	4		200.8 LL	Total/NA
Barium	0.020	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Cobalt	0.0096	D1	0.0020		mg/L	4		200.8 LL	Total/NA
Molybdenum	0.038	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Selenium	0.0045	D1	0.0020		mg/L	4		200.8 LL	Total/NA
Thallium	0.0011	D1	0.00020		mg/L	2		200.8 LL	Total/NA
Total Dissolved Solids	20000	D2	200		mg/L	1		SM 2540C	Total/NA
pH	7.4	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW68-120219 — Lab Sample ID: 550-134494-3

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	1200	D2	400		mg/L	200		300.0	Total/NA
Fluoride	10	D1	0.80		mg/L	2		300.0	Total/NA
Sulfate	9600	D2	400		mg/L	200		300.0	Total/NA
Boron	94	B3	0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	450		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.37		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0058	D1	0.0020		mg/L	4		200.8 LL	Total/NA
Barium	0.068	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Cobalt	0.0037	D1	0.0020		mg/L	4		200.8 LL	Total/NA
Lead	0.0013	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Molybdenum	0.0068	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Selenium	0.12	D1	0.0020		mg/L	4		200.8 LL	Total/NA
Thallium	0.0017	D1	0.00020		mg/L	2		200.8 LL	Total/NA
Total Dissolved Solids	15000	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.0	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Phoenix

Detection Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-134494-1

Client Sample ID: FC-CCR-MW69-120219 — Lab Sample ID: 550-134494-4

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	1000	D2	400		mg/L	200		300.0	Total/NA
Fluoride	9.0	D1	0.80		mg/L	2		300.0	Total/NA
Sulfate	8100	D2	400		mg/L	200		300.0	Total/NA
Boron	88	B3	0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	490		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.35		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0070	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Barium	0.011	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Cobalt	0.0047	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Molybdenum	0.0096	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Selenium	0.12	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Thallium	0.00053	D1	0.00020		mg/L	2		200.8 LL	Total/NA
Total Dissolved Solids	13000	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.2	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW70-120319 — Lab Sample ID: 550-134494-5

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	1200	D2	400		mg/L	200		300.0	Total/NA
Fluoride	2.1	D1	0.80		mg/L	2		300.0	Total/NA
Sulfate	6400	D2	400		mg/L	200		300.0	Total/NA
Boron	95	B3	0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	510		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.33		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0076	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Barium	0.012	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Cobalt	0.0036	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Molybdenum	0.0075	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Selenium	0.19	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Thallium	0.00028	D1	0.00020		mg/L	2		200.8 LL	Total/NA
Total Dissolved Solids	11000	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.0	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW71-120219 — Lab Sample ID: 550-134494-6

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	500	D2	400		mg/L	200		300.0	Total/NA
Sulfate	10000	D2	400		mg/L	200		300.0	Total/NA
Boron	0.50		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	440	M3	2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.32		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0095	D1	0.0020		mg/L	4		200.8 LL	Total/NA
Barium	0.012	D1	0.0020		mg/L	4		200.8 LL	Total/NA
Selenium	0.27	D1	0.0020		mg/L	4		200.8 LL	Total/NA
Thallium	0.00065	D1	0.00040		mg/L	4		200.8 LL	Total/NA
Total Dissolved Solids	16000	D2 H1	100		mg/L	1		SM 2540C	Total/NA
pH	7.2	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW72-120219 — Lab Sample ID: 550-134494-7

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	430	D2	400		mg/L	200		300.0	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-MW72-120219 (Continued) — Lab Sample ID: 550-134494-7

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Sulfate	11000	D2	400		mg/L	200		300.0	Total/NA
Boron	0.19		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	430		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.36		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0031	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Barium	0.0081	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Cobalt	0.0023	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Molybdenum	0.0014	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Selenium	0.11	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Thallium	0.0011	D1	0.00020		mg/L	2		200.8 LL	Total/NA
Total Dissolved Solids	16000	D2 H1	100		mg/L	1		SM 2540C	Total/NA
pH	7.1	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW73-120219 — Lab Sample ID: 550-134494-8

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	520	D2	400		mg/L	200		300.0	Total/NA
Sulfate	7100	D2	400		mg/L	200		300.0	Total/NA
Boron	1.6	B3	0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	460		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.23		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.020	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Cobalt	0.0040	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Molybdenum	0.0020	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Selenium	0.0086	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Thallium	0.00022	D1	0.00020		mg/L	2		200.8 LL	Total/NA
Total Dissolved Solids	11000	D2 H1	100		mg/L	1		SM 2540C	Total/NA
pH	7.1	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW83-120319 — Lab Sample ID: 550-134494-9

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	130		4.0		mg/L	2		300.0	Total/NA
Fluoride	1.8	D1	0.80		mg/L	2		300.0	Total/NA
Sulfate	3600	D2	400		mg/L	200		300.0	Total/NA
Boron	2.5	B3	0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	480		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.018	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Cobalt	0.0023	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Molybdenum	0.0096	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Selenium	0.0021	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Total Dissolved Solids	5400	D2 H1	100		mg/L	1		SM 2540C	Total/NA
pH	7.4	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-FD01-120219 — Lab Sample ID: 550-134494-10

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	500	D2	400		mg/L	200		300.0	Total/NA
Sulfate	6900	D2	400		mg/L	200		300.0	Total/NA
Boron	1.7	B3	0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	480		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.23		0.20		mg/L	1		200.7 Rev 4.4	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-FD01-120219 (Continued) — Lab Sample ID: 550-134494-10

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Barium	0.020	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Cobalt	0.0039	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Molybdenum	0.0021	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Selenium	0.0094	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Thallium	0.00021	D1	0.00020		mg/L	2		200.8 LL	Total/NA
Total Dissolved Solids	11000	D2 H1	100		mg/L	1		SM 2540C	Total/NA
pH	7.0	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW84-120319 — Lab Sample ID: 550-134494-11

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	1400	D2	400		mg/L	200		300.0	Total/NA
Sulfate	8900	D2	400		mg/L	200		300.0	Total/NA
Boron	110	B3	0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	470		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0011	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Barium	0.019	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Cadmium	0.00030	D1	0.00020		mg/L	2		200.8 LL	Total/NA
Cobalt	0.0086	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Molybdenum	0.0051	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Selenium	0.0028	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Thallium	0.00036	D1	0.00020		mg/L	2		200.8 LL	Total/NA
Total Dissolved Solids	14000	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.0	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW85-120319 — Lab Sample ID: 550-134494-12

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	580	D2	400		mg/L	200		300.0	Total/NA
Sulfate	4600	D2	400		mg/L	200		300.0	Total/NA
Boron	20	B3	0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	500		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.23		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0061	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Barium	0.017	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Molybdenum	0.0021	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Selenium	0.13	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Thallium	0.00030	D1	0.00020		mg/L	2		200.8 LL	Total/NA
Total Dissolved Solids	8200	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.0	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW86-120319 — Lab Sample ID: 550-134494-13

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	1400	D2	400		mg/L	200		300.0	Total/NA
Sulfate	8700	D2	400		mg/L	200		300.0	Total/NA
Boron	120	B3	0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	480		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.31		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0014	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Barium	0.018	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Chromium	0.035	D1	0.0040		mg/L	4		200.8 LL	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-MW86-120319 (Continued) — Lab Sample ID: 550-134494-13

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Cobalt	0.0055	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Molybdenum	0.0015	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Selenium	0.0015	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Thallium	0.00075	D1	0.00020		mg/L	2		200.8 LL	Total/NA
Total Dissolved Solids	14000	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.1	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-FD02-120319 — Lab Sample ID: 550-134494-14

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	1800	D2	400		mg/L	200		300.0	Total/NA
Fluoride	22	D1	0.80		mg/L	2		300.0	Total/NA
Sulfate	14000	D2	400		mg/L	200		300.0	Total/NA
Boron	150	B3	0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	460		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Lithium	0.33		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0013	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Barium	0.021	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Cobalt	0.011	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Molybdenum	0.020	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Selenium	0.0020	D1	0.0010		mg/L	2		200.8 LL	Total/NA
Thallium	0.00083	D1	0.00020		mg/L	2		200.8 LL	Total/NA
Total Dissolved Solids	19000	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.3	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-MW66-120319

Lab Sample ID: 550-134494-1

Date Collected: 12/03/19 14:45

Matrix: Water

Date Received: 12/09/19 10:20

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1800**	**D2**	400		mg/L			12/17/19 21:10	200
Fluoride	**22**	**D1**	0.80		mg/L			12/17/19 20:52	2
Sulfate	**12000**	**D2**	400		mg/L			12/17/19 21:10	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		12/10/19 07:11	12/23/19 23:39	1
Boron	**130**	**B3**	0.050		mg/L		12/10/19 07:11	12/23/19 23:39	1
Calcium	**430**		2.0		mg/L		12/10/19 07:11	12/23/19 23:39	1
Lithium	**0.32**		0.20		mg/L		12/10/19 07:11	12/23/19 23:39	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	D1	0.0020		mg/L		12/10/19 05:37	12/24/19 14:10	2
Arsenic	ND	D1	0.0020		mg/L		12/10/19 05:37	12/24/19 14:52	4
Barium	**0.024**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:10	2
Cadmium	ND	D1	0.00020		mg/L		12/10/19 05:37	12/24/19 14:10	2
Chromium	ND	D1	0.0040		mg/L		12/26/19 15:45	12/31/19 22:04	4
Cobalt	**0.012**	**D1**	0.0020		mg/L		12/10/19 05:37	12/24/19 14:52	4
Lead	ND	D1	0.0010		mg/L		12/10/19 05:37	12/24/19 14:10	2
Molybdenum	**0.023**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:10	2
Selenium	ND	D1	0.0020		mg/L		12/10/19 05:37	12/24/19 14:52	4
Thallium	**0.0010**	**D1**	0.00020		mg/L		12/10/19 05:37	12/24/19 14:10	2

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		12/17/19 14:08	12/17/19 17:30	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**19000**	**D2**	100		mg/L			12/10/19 08:10	1
pH	**7.2**	**H5**	1.7		SU			12/12/19 14:14	1

Client Sample ID: FC-CCR-MW67-120219

Lab Sample ID: 550-134494-2

Date Collected: 12/03/19 18:59

Matrix: Water

Date Received: 12/09/19 10:20

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1900**	**D2**	400		mg/L			12/17/19 21:47	200
Fluoride	**14**	**D1**	0.80		mg/L			12/17/19 21:29	2
Sulfate	**13000**	**D2**	400		mg/L			12/17/19 21:47	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		12/10/19 07:11	12/23/19 23:43	1
Boron	**150**	**B3**	0.050		mg/L		12/10/19 07:11	12/23/19 23:43	1
Calcium	**450**		2.0		mg/L		12/10/19 07:11	12/23/19 23:43	1
Lithium	**0.37**		0.20		mg/L		12/10/19 07:11	12/23/19 23:43	1

Client Sample ID: FC-CCR-MW67-120219

Lab Sample ID: 550-134494-2

Date Collected: 12/03/19 18:59

Matrix: Water

Date Received: 12/09/19 10:20

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	D1	0.0020		mg/L		12/10/19 05:37	12/24/19 14:12	2
Arsenic	**0.0035**	**D1**	0.0020		mg/L		12/10/19 05:37	12/24/19 14:54	4
Barium	**0.020**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:12	2
Cadmium	ND	D1	0.00020		mg/L		12/10/19 05:37	12/24/19 14:12	2
Chromium	ND	D1	0.0040		mg/L		12/26/19 15:45	12/31/19 22:06	4
Cobalt	**0.0096**	**D1**	0.0020		mg/L		12/10/19 05:37	12/24/19 14:54	4
Lead	ND	D1	0.0010		mg/L		12/10/19 05:37	12/24/19 14:12	2
Molybdenum	**0.038**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:12	2
Selenium	**0.0045**	**D1**	0.0020		mg/L		12/10/19 05:37	12/24/19 14:54	4
Thallium	**0.0011**	**D1**	0.00020		mg/L		12/10/19 05:37	12/24/19 14:12	2

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		12/17/19 14:08	12/17/19 17:31	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**20000**	**D2**	200		mg/L			12/10/19 08:10	1
pH	**7.4**	**H5**	1.7		SU			12/12/19 14:14	1

Client Sample ID: FC-CCR-MW68-120219

Lab Sample ID: 550-134494-3

Date Collected: 12/03/19 17:31

Matrix: Water

Date Received: 12/09/19 10:20

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1200**	**D2**	400		mg/L			12/17/19 22:24	200
Fluoride	**10**	**D1**	0.80		mg/L			12/17/19 22:06	2
Sulfate	**9600**	**D2**	400		mg/L			12/17/19 22:24	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		12/10/19 07:11	12/23/19 23:46	1
Boron	**94**	**B3**	0.050		mg/L		12/10/19 07:11	12/23/19 23:46	1
Calcium	**450**		2.0		mg/L		12/10/19 07:11	12/23/19 23:46	1
Lithium	**0.37**		0.20		mg/L		12/10/19 07:11	12/23/19 23:46	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	D1	0.0020		mg/L		12/10/19 05:37	12/24/19 14:14	2
Arsenic	**0.0058**	**D1**	0.0020		mg/L		12/10/19 05:37	12/24/19 14:56	4
Barium	**0.068**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:14	2
Cadmium	ND	D1	0.00020		mg/L		12/10/19 05:37	12/24/19 14:14	2
Chromium	ND	D1	0.0040		mg/L		12/26/19 15:45	12/31/19 22:08	4
Cobalt	**0.0037**	**D1**	0.0020		mg/L		12/10/19 05:37	12/24/19 14:56	4
Lead	**0.0013**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:14	2
Molybdenum	**0.0068**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:14	2
Selenium	**0.12**	**D1**	0.0020		mg/L		12/10/19 05:37	12/24/19 14:56	4
Thallium	**0.0017**	**D1**	0.00020		mg/L		12/10/19 05:37	12/24/19 14:14	2

Client Sample ID: FC-CCR-MW68-120219

Lab Sample ID: 550-134494-3

Date Collected: 12/03/19 17:31

Matrix: Water

Date Received: 12/09/19 10:20

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		12/17/19 14:08	12/17/19 17:33	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**15000**	**D2**	100		mg/L			12/10/19 08:10	1
pH	**7.0**	**H5**	1.7		SU			12/12/19 14:14	1

Client Sample ID: FC-CCR-MW69-120219

Lab Sample ID: 550-134494-4

Date Collected: 12/03/19 16:50

Matrix: Water

Date Received: 12/09/19 10:20

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1000**	**D2**	400		mg/L			12/17/19 23:38	200
Fluoride	**9.0**	**D1**	0.80		mg/L			12/17/19 23:19	2
Sulfate	**8100**	**D2**	400		mg/L			12/17/19 23:38	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		12/10/19 07:11	12/23/19 23:50	1
Boron	**88**	**B3**	0.050		mg/L		12/10/19 07:11	12/23/19 23:50	1
Calcium	**490**		2.0		mg/L		12/10/19 07:11	12/23/19 23:50	1
Lithium	**0.35**		0.20		mg/L		12/10/19 07:11	12/23/19 23:50	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	D1	0.0020		mg/L		12/10/19 05:37	12/24/19 14:21	2
Arsenic	**0.0070**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:21	2
Barium	**0.011**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:21	2
Cadmium	ND	D1	0.00020		mg/L		12/10/19 05:37	12/24/19 14:21	2
Chromium	ND	D1	0.0040		mg/L		12/26/19 15:45	12/31/19 22:10	4
Cobalt	**0.0047**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:21	2
Lead	ND	D1	0.0010		mg/L		12/10/19 05:37	12/24/19 14:21	2
Molybdenum	**0.0096**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:21	2
Selenium	**0.12**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:21	2
Thallium	**0.00053**	**D1**	0.00020		mg/L		12/10/19 05:37	12/24/19 14:21	2

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		12/17/19 14:08	12/17/19 17:34	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**13000**	**D2**	100		mg/L			12/10/19 08:10	1
pH	**7.2**	**H5**	1.7		SU			12/12/19 14:14	1

Client Sample ID: FC-CCR-MW70-120319

Lab Sample ID: 550-134494-5

Date Collected: 12/03/19 15:45
Matrix: Water
Date Received: 12/09/19 10:20

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1200**	**D2**	400		mg/L			12/18/19 00:14	200
Fluoride	**2.1**	**D1**	0.80		mg/L			12/17/19 23:56	2
Sulfate	**6400**	**D2**	400		mg/L			12/18/19 00:14	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		12/10/19 07:11	12/23/19 23:54	1
Boron	**95**	**B3**	0.050		mg/L		12/10/19 07:11	12/23/19 23:54	1
Calcium	**510**		2.0		mg/L		12/10/19 07:11	12/23/19 23:54	1
Lithium	**0.33**		0.20		mg/L		12/10/19 07:11	12/23/19 23:54	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	D1	0.0020		mg/L		12/10/19 05:37	12/24/19 14:23	2
Arsenic	**0.0076**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:23	2
Barium	**0.012**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:23	2
Cadmium	ND	D1	0.00020		mg/L		12/10/19 05:37	12/24/19 14:23	2
Chromium	ND	D1	0.0040		mg/L		12/26/19 15:45	12/31/19 22:13	4
Cobalt	**0.0036**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:23	2
Lead	ND	D1	0.0010		mg/L		12/10/19 05:37	12/24/19 14:23	2
Molybdenum	**0.0075**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:23	2
Selenium	**0.19**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:23	2
Thallium	**0.00028**	**D1**	0.00020		mg/L		12/10/19 05:37	12/24/19 14:23	2

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		12/17/19 14:08	12/17/19 17:36	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**11000**	**D2**	100		mg/L			12/10/19 08:10	1
pH	**7.0**	**H5**	1.7		SU			12/12/19 14:14	1

Client Sample ID: FC-CCR-MW71-120219

Lab Sample ID: 550-134494-6

Date Collected: 12/02/19 15:06
Matrix: Water
Date Received: 12/09/19 10:20

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**500**	**D2**	400		mg/L			12/18/19 01:28	200
Fluoride	ND	D1 D5	0.80		mg/L			12/18/19 00:33	2
Sulfate	**10000**	**D2**	400		mg/L			12/18/19 01:28	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		12/10/19 07:11	12/23/19 23:36	1
Boron	**0.50**		0.050		mg/L		12/10/19 07:11	12/24/19 19:35	1
Calcium	**440**	**M3**	2.0		mg/L		12/10/19 07:11	12/23/19 23:36	1
Lithium	**0.32**		0.20		mg/L		12/10/19 07:11	12/23/19 23:36	1

Client Sample ID: FC-CCR-MW71-120219

Lab Sample ID: 550-134494-6

Date Collected: 12/02/19 15:06

Matrix: Water

Date Received: 12/09/19 10:20

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	D1	0.0040		mg/L		12/10/19 05:37	12/24/19 14:06	4
Arsenic	**0.0095**	**D1**	0.0020		mg/L		12/10/19 05:37	12/24/19 14:06	4
Barium	**0.012**	**D1**	0.0020		mg/L		12/10/19 05:37	12/24/19 14:06	4
Cadmium	ND	D1	0.00040		mg/L		12/10/19 05:37	12/24/19 14:06	4
Chromium	ND	D1	0.0040		mg/L		12/26/19 15:45	12/31/19 22:02	4
Cobalt	ND	D1	0.0020		mg/L		12/10/19 05:37	12/24/19 14:06	4
Lead	ND	D1	0.0020		mg/L		12/10/19 05:37	12/24/19 14:06	4
Molybdenum	ND	D1	0.0020		mg/L		12/10/19 05:37	12/24/19 14:06	4
Selenium	**0.27**	**D1**	0.0020		mg/L		12/10/19 05:37	12/24/19 14:06	4
Thallium	**0.00065**	**D1**	0.00040		mg/L		12/10/19 05:37	12/24/19 14:06	4

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		12/17/19 14:08	12/17/19 17:28	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**16000**	**D2 H1**	100		mg/L			12/10/19 08:10	1
pH	**7.2**	**H5**	1.7		SU			12/12/19 14:14	1

Client Sample ID: FC-CCR-MW72-120219

Lab Sample ID: 550-134494-7

Date Collected: 12/02/19 16:02

Matrix: Water

Date Received: 12/09/19 10:20

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**430**	**D2**	400		mg/L			12/18/19 03:18	200
Fluoride	ND	D1 D5	0.80		mg/L			12/18/19 03:00	2
Sulfate	**11000**	**D2**	400		mg/L			12/18/19 03:18	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		12/10/19 07:11	12/24/19 00:03	1
Boron	**0.19**		0.050		mg/L		12/10/19 07:11	12/24/19 19:38	1
Calcium	**430**		2.0		mg/L		12/10/19 07:11	12/24/19 00:03	1
Lithium	**0.36**		0.20		mg/L		12/10/19 07:11	12/24/19 00:03	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	D1	0.0020		mg/L		12/10/19 05:37	12/24/19 14:25	2
Arsenic	**0.0031**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:25	2
Barium	**0.0081**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:25	2
Cadmium	ND	D1	0.00020		mg/L		12/10/19 05:37	12/24/19 14:25	2
Chromium	ND	D1	0.0040		mg/L		12/26/19 15:45	12/31/19 22:15	4
Cobalt	**0.0023**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:25	2
Lead	ND	D1	0.0010		mg/L		12/10/19 05:37	12/24/19 14:25	2
Molybdenum	**0.0014**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:25	2
Selenium	**0.11**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:25	2
Thallium	**0.0011**	**D1**	0.00020		mg/L		12/10/19 05:37	12/24/19 14:25	2

Client Sample ID: FC-CCR-MW72-120219

Lab Sample ID: 550-134494-7

Date Collected: 12/02/19 16:02

Matrix: Water

Date Received: 12/09/19 10:20

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		12/17/19 14:08	12/17/19 17:37	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**16000**	**D2 H1**	100		mg/L			12/10/19 08:10	1
pH	**7.1**	**H5**	1.7		SU			12/12/19 14:14	1

Client Sample ID: FC-CCR-MW73-120219

Lab Sample ID: 550-134494-8

Date Collected: 12/02/19 14:08

Matrix: Water

Date Received: 12/09/19 10:20

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**520**	**D2**	400		mg/L			12/18/19 03:55	200
Fluoride	ND	D1 D5	0.80		mg/L			12/18/19 03:37	2
Sulfate	**7100**	**D2**	400		mg/L			12/18/19 03:55	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		12/10/19 07:11	12/20/19 02:59	1
Boron	**1.6**	**B3**	0.050		mg/L		12/10/19 07:11	12/20/19 02:59	1
Calcium	**460**		2.0		mg/L		12/10/19 07:11	12/24/19 00:07	1
Lithium	**0.23**		0.20		mg/L		12/10/19 07:11	12/20/19 02:59	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	D1	0.0020		mg/L		12/10/19 05:37	12/24/19 14:27	2
Arsenic	ND	D1	0.0010		mg/L		12/10/19 05:37	12/24/19 14:27	2
Barium	**0.020**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:27	2
Cadmium	ND	D1	0.00020		mg/L		12/10/19 05:37	12/24/19 14:27	2
Chromium	ND	D1	0.0040		mg/L		12/26/19 15:45	12/31/19 22:21	4
Cobalt	**0.0040**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:27	2
Lead	ND	D1	0.0010		mg/L		12/10/19 05:37	12/24/19 14:27	2
Molybdenum	**0.0020**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:27	2
Selenium	**0.0086**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:27	2
Thallium	**0.00022**	**D1**	0.00020		mg/L		12/10/19 05:37	12/24/19 14:27	2

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		12/17/19 14:08	12/17/19 17:39	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**11000**	**D2 H1**	100		mg/L			12/10/19 08:10	1
pH	**7.1**	**H5**	1.7		SU			12/12/19 14:14	1

Client Sample ID: FC-CCR-MW83-120319

Lab Sample ID: 550-134494-9

Date Collected: 12/02/19 09:52

Matrix: Water

Date Received: 12/09/19 10:20

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**130**		4.0		mg/L			12/18/19 04:14	2
Fluoride	**1.8**	**D1**	0.80		mg/L			12/18/19 04:14	2
Sulfate	**3600**	**D2**	400		mg/L			12/18/19 04:32	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		12/10/19 07:11	12/20/19 03:03	1
Boron	**2.5**	**B3**	0.050		mg/L		12/10/19 07:11	12/20/19 03:03	1
Calcium	**480**		2.0		mg/L		12/10/19 07:11	12/24/19 00:10	1
Lithium	ND		0.20		mg/L		12/10/19 07:11	12/20/19 03:03	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	D1	0.0020		mg/L		12/10/19 05:37	12/24/19 14:29	2
Arsenic	ND	D1	0.0010		mg/L		12/10/19 05:37	12/24/19 14:29	2
Barium	**0.018**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:29	2
Cadmium	ND	D1	0.00020		mg/L		12/10/19 05:37	12/24/19 14:29	2
Chromium	ND	D1	0.0040		mg/L		12/26/19 15:45	12/31/19 22:23	4
Cobalt	**0.0023**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:29	2
Lead	ND	D1	0.0010		mg/L		12/10/19 05:37	12/24/19 14:29	2
Molybdenum	**0.0096**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:29	2
Selenium	**0.0021**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:29	2
Thallium	ND	D1	0.00020		mg/L		12/10/19 05:37	12/24/19 14:29	2

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		12/17/19 14:08	12/17/19 17:40	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**5400**	**D2 H1**	100		mg/L			12/10/19 08:10	1
pH	**7.4**	**H5**	1.7		SU			12/12/19 14:14	1

Client Sample ID: FC-CCR-FD01-120219

Lab Sample ID: 550-134494-10

Date Collected: 12/02/19 14:08

Matrix: Water

Date Received: 12/09/19 10:20

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**500**	**D2**	400		mg/L			12/18/19 05:09	200
Fluoride	ND	D1 D5	0.80		mg/L			12/18/19 04:50	2
Sulfate	**6900**	**D2**	400		mg/L			12/18/19 05:09	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		12/10/19 07:11	12/20/19 03:06	1
Boron	**1.7**	**B3**	0.050		mg/L		12/10/19 07:11	12/20/19 03:06	1
Calcium	**480**		2.0		mg/L		12/10/19 07:11	12/24/19 00:14	1
Lithium	**0.23**		0.20		mg/L		12/10/19 07:11	12/20/19 03:06	1

Client Sample ID: FC-CCR-FD01-120219

Lab Sample ID: 550-134494-10

Date Collected: 12/02/19 14:08

Matrix: Water

Date Received: 12/09/19 10:20

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	D1	0.0020		mg/L		12/10/19 05:37	12/24/19 14:31	2
Arsenic	ND	D1	0.0010		mg/L		12/10/19 05:37	12/24/19 14:31	2
Barium	**0.020**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:31	2
Cadmium	ND	D1	0.00020		mg/L		12/10/19 05:37	12/24/19 14:31	2
Chromium	ND	D1	0.0040		mg/L		12/26/19 15:45	12/31/19 22:25	4
Cobalt	**0.0039**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:31	2
Lead	ND	D1	0.0010		mg/L		12/10/19 05:37	12/24/19 14:31	2
Molybdenum	**0.0021**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:31	2
Selenium	**0.0094**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:31	2
Thallium	**0.00021**	**D1**	0.00020		mg/L		12/10/19 05:37	12/24/19 14:31	2

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		12/17/19 14:08	12/17/19 17:42	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**11000**	**D2 H1**	100		mg/L			12/10/19 08:10	1
pH	**7.0**	**H5**	1.7		SU			12/12/19 14:14	1

Client Sample ID: FC-CCR-MW84-120319

Lab Sample ID: 550-134494-11

Date Collected: 12/03/19 07:57

Matrix: Water

Date Received: 12/09/19 10:20

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1400**	**D2**	400		mg/L			12/18/19 05:46	200
Fluoride	ND	D1 D5	0.80		mg/L			12/18/19 05:27	2
Sulfate	**8900**	**D2**	400		mg/L			12/18/19 05:46	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		12/10/19 07:11	12/20/19 03:10	1
Boron	**110**	**B3**	0.050		mg/L		12/10/19 07:11	12/20/19 03:10	1
Calcium	**470**		2.0		mg/L		12/10/19 07:11	12/24/19 00:17	1
Lithium	ND		0.20		mg/L		12/10/19 07:11	12/20/19 03:10	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	D1	0.0020		mg/L		12/10/19 05:37	12/24/19 14:33	2
Arsenic	**0.0011**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:33	2
Barium	**0.019**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:33	2
Cadmium	**0.00030**	**D1**	0.00020		mg/L		12/10/19 05:37	12/24/19 14:33	2
Chromium	ND	D1	0.0040		mg/L		12/26/19 15:45	12/31/19 22:27	4
Cobalt	**0.0086**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:33	2
Lead	ND	D1	0.0010		mg/L		12/10/19 05:37	12/24/19 14:33	2
Molybdenum	**0.0051**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:33	2
Selenium	**0.0028**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:33	2
Thallium	**0.00036**	**D1**	0.00020		mg/L		12/10/19 05:37	12/24/19 14:33	2

Client Sample ID: FC-CCR-MW84-120319

Lab Sample ID: 550-134494-11

Date Collected: 12/03/19 07:57

Matrix: Water

Date Received: 12/09/19 10:20

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		12/17/19 14:08	12/17/19 17:59	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**14000**	**D2**	100		mg/L			12/10/19 08:10	1
pH	**7.0**	**H5**	1.7		SU			12/12/19 14:14	1

Client Sample ID: FC-CCR-MW85-120319

Lab Sample ID: 550-134494-12

Date Collected: 12/03/19 08:47

Matrix: Water

Date Received: 12/09/19 10:20

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**580**	**D2**	400		mg/L			12/18/19 06:59	200
Fluoride	ND	D1 D5	0.80		mg/L			12/18/19 06:41	2
Sulfate	**4600**	**D2**	400		mg/L			12/18/19 06:59	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		12/10/19 07:11	12/20/19 03:14	1
Boron	**20**	**B3**	0.050		mg/L		12/10/19 07:11	12/20/19 03:14	1
Calcium	**500**		2.0		mg/L		12/10/19 07:11	12/24/19 00:21	1
Lithium	**0.23**		0.20		mg/L		12/10/19 07:11	12/20/19 03:14	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	D1	0.0020		mg/L		12/10/19 05:37	12/24/19 14:35	2
Arsenic	**0.0061**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:35	2
Barium	**0.017**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:35	2
Cadmium	ND	D1	0.00020		mg/L		12/10/19 05:37	12/24/19 14:35	2
Chromium	ND	D1	0.0040		mg/L		12/26/19 15:45	12/31/19 22:29	4
Cobalt	ND	D1	0.0010		mg/L		12/10/19 05:37	12/24/19 14:35	2
Lead	ND	D1	0.0010		mg/L		12/10/19 05:37	12/24/19 14:35	2
Molybdenum	**0.0021**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:35	2
Selenium	**0.13**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:35	2
Thallium	**0.00030**	**D1**	0.00020		mg/L		12/10/19 05:37	12/24/19 14:35	2

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		12/17/19 14:08	12/17/19 18:01	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**8200**	**D2**	100		mg/L			12/10/19 08:10	1
pH	**7.0**	**H5**	1.7		SU			12/12/19 14:14	1

Client Sample ID: FC-CCR-MW86-120319

Lab Sample ID: 550-134494-13

Date Collected: 12/03/19 13:56

Matrix: Water

Date Received: 12/09/19 10:20

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1400**	**D2**	400		mg/L			12/18/19 07:36	200
Fluoride	ND	D1 D5	0.80		mg/L			12/18/19 07:18	2
Sulfate	**8700**	**D2**	400		mg/L			12/18/19 07:36	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		12/10/19 07:11	12/20/19 03:17	1
Boron	**120**	**B3**	0.050		mg/L		12/10/19 07:11	12/20/19 03:17	1
Calcium	**480**		2.0		mg/L		12/10/19 07:11	12/24/19 00:24	1
Lithium	**0.31**		0.20		mg/L		12/10/19 07:11	12/20/19 03:17	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	D1	0.0020		mg/L		12/10/19 05:37	12/24/19 14:37	2
Arsenic	**0.0014**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:37	2
Barium	**0.018**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:37	2
Cadmium	ND	D1	0.00020		mg/L		12/10/19 05:37	12/24/19 14:37	2
Chromium	**0.035**	**D1**	0.0040		mg/L		12/26/19 15:45	12/31/19 22:31	4
Cobalt	**0.0055**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:37	2
Lead	ND	D1	0.0010		mg/L		12/10/19 05:37	12/24/19 14:37	2
Molybdenum	**0.0015**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:37	2
Selenium	**0.0015**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:37	2
Thallium	**0.00075**	**D1**	0.00020		mg/L		12/10/19 05:37	12/24/19 14:37	2

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		12/17/19 14:08	12/17/19 18:02	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**14000**	**D2**	100		mg/L			12/10/19 08:10	1
pH	**7.1**	**H5**	1.7		SU			12/12/19 14:14	1

Client Sample ID: FC-CCR-FD02-120319

Lab Sample ID: 550-134494-14

Date Collected: 12/03/19 14:45

Matrix: Water

Date Received: 12/09/19 10:20

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1800**	**D2**	400		mg/L			12/18/19 08:13	200
Fluoride	**22**	**D1**	0.80		mg/L			12/18/19 07:54	2
Sulfate	**14000**	**D2**	400		mg/L			12/18/19 08:13	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		12/10/19 07:11	12/20/19 03:21	1
Boron	**150**	**B3**	0.050		mg/L		12/10/19 07:11	12/20/19 03:21	1
Calcium	**460**		2.0		mg/L		12/10/19 07:11	12/24/19 00:28	1
Lithium	**0.33**		0.20		mg/L		12/10/19 07:11	12/20/19 03:21	1

Client Sample Results

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-134494-1

Client Sample ID: FC-CCR-FD02-120319

Lab Sample ID: 550-134494-14

Date Collected: 12/03/19 14:45

Matrix: Water

Date Received: 12/09/19 10:20

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	D1	0.0020		mg/L		12/10/19 05:37	12/24/19 14:39	2
Arsenic	**0.0013**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:39	2
Barium	**0.021**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:39	2
Cadmium	ND	D1	0.00020		mg/L		12/10/19 05:37	12/24/19 14:39	2
Chromium	ND	D1	0.0040		mg/L		12/26/19 15:45	12/31/19 22:34	4
Cobalt	**0.011**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:39	2
Lead	ND	D1	0.0010		mg/L		12/10/19 05:37	12/24/19 14:39	2
Molybdenum	**0.020**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:39	2
Selenium	**0.0020**	**D1**	0.0010		mg/L		12/10/19 05:37	12/24/19 14:39	2
Thallium	**0.00083**	**D1**	0.00020		mg/L		12/10/19 05:37	12/24/19 14:39	2

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		12/17/19 14:08	12/17/19 18:04	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**19000**	**D2**	100		mg/L			12/10/19 08:10	1
pH	**7.3**	**H5**	1.7		SU			12/12/19 14:14	1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 550-198331/2
Matrix: Water
Analysis Batch: 198331

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		2.0		mg/L			12/17/19 18:06	1
Fluoride	ND		0.40		mg/L			12/17/19 18:06	1
Sulfate	ND		2.0		mg/L			12/17/19 18:06	1

Lab Sample ID: LCS 550-198331/5
Matrix: Water
Analysis Batch: 198331

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride			20.0	21.5		mg/L		108	90 - 110		
Fluoride			4.00	4.09		mg/L		102	90 - 110		
Sulfate			20.0	20.8		mg/L		104	90 - 110		

Lab Sample ID: LCSD 550-198331/6
Matrix: Water
Analysis Batch: 198331

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride			20.0	21.5		mg/L		107	90 - 110	0	20
Fluoride			4.00	4.10		mg/L		102	90 - 110	0	20
Sulfate			20.0	20.8		mg/L		104	90 - 110	0	20

Lab Sample ID: 550-134494-6 MS
Matrix: Water
Analysis Batch: 198331

Client Sample ID: FC-CCR-MW71-120219
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride	ND	D1 D5	8.00	7.82	D1	mg/L		95	80 - 120		

Lab Sample ID: 550-134494-6 MS
Matrix: Water
Analysis Batch: 198331

Client Sample ID: FC-CCR-MW71-120219
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride	500	D2	4000	4940	D2	mg/L		111	80 - 120		
Sulfate	10000	D2	4000	13900	D2	mg/L		91	80 - 120		

Lab Sample ID: 550-134494-6 MSD
Matrix: Water
Analysis Batch: 198331

Client Sample ID: FC-CCR-MW71-120219
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	ND	D1 D5	8.00	7.97	D1	mg/L		97	80 - 120	2	20

Lab Sample ID: 550-134494-6 MSD
Matrix: Water
Analysis Batch: 198331

Client Sample ID: FC-CCR-MW71-120219
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	500	D2	4000	4960	D2	mg/L		112	80 - 120	0	20

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 550-134494-6 MSD
Matrix: Water
Analysis Batch: 198331

Client Sample ID: FC-CCR-MW71-120219
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	10000	D2	4000	14000	D2	mg/L		92	80 - 120	0	20

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 550-197604/1-A
Matrix: Water
Analysis Batch: 198848

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 197604

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010		mg/L		12/10/19 07:11	12/23/19 23:21	1
Boron	ND		0.050		mg/L		12/10/19 07:11	12/23/19 23:21	1
Calcium	ND		2.0		mg/L		12/10/19 07:11	12/23/19 23:21	1
Lithium	ND		0.20		mg/L		12/10/19 07:11	12/23/19 23:21	1

Lab Sample ID: MB 550-197604/1-A
Matrix: Water
Analysis Batch: 198962

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 197604

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.050		mg/L		12/10/19 07:11	12/24/19 19:19	1

Lab Sample ID: LCS 550-197604/2-A
Matrix: Water
Analysis Batch: 198848

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 197604

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Beryllium			1.00	1.00		mg/L		100	85 - 115		
Boron			1.00	0.974		mg/L		97	85 - 115		
Calcium			21.0	21.7		mg/L		103	85 - 115		
Lithium			1.00	0.967		mg/L		97	85 - 115		

Lab Sample ID: LCS 550-197604/2-A
Matrix: Water
Analysis Batch: 198962

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 197604

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Boron			1.00	1.00		mg/L		100	85 - 115		

Lab Sample ID: LCSD 550-197604/3-A
Matrix: Water
Analysis Batch: 198848

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 197604

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Beryllium			1.00	1.01		mg/L		101	85 - 115	1	20
Boron			1.00	0.979		mg/L		98	85 - 115	0	20
Calcium			21.0	21.9		mg/L		104	85 - 115	1	20
Lithium			1.00	0.972		mg/L		97	85 - 115	1	20

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: LCSD 550-197604/3-A
Matrix: Water
Analysis Batch: 198962

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 197604

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron			1.00	1.01		mg/L		101	85 - 115	1	20

Lab Sample ID: 550-134494-6 MS
Matrix: Water
Analysis Batch: 198848

Client Sample ID: FC-CCR-MW71-120219
Prep Type: Total/NA
Prep Batch: 197604

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Beryllium	ND		1.00	0.951		mg/L		95	70 - 130
Calcium	440	M3	21.0	432	M3	mg/L		-19	70 - 130
Lithium	0.32		1.00	1.33		mg/L		100	70 - 130

Lab Sample ID: 550-134494-6 MS
Matrix: Water
Analysis Batch: 198962

Client Sample ID: FC-CCR-MW71-120219
Prep Type: Total/NA
Prep Batch: 197604

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	0.50		1.00	1.52		mg/L		102	70 - 130

Lab Sample ID: 550-134494-6 MSD
Matrix: Water
Analysis Batch: 198848

Client Sample ID: FC-CCR-MW71-120219
Prep Type: Total/NA
Prep Batch: 197604

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Beryllium	ND		1.00	0.962		mg/L		96	70 - 130	1	20
Calcium	440	M3	21.0	431	M3	mg/L		-23	70 - 130	0	20
Lithium	0.32		1.00	1.33		mg/L		100	70 - 130	0	20

Lab Sample ID: 550-134494-6 MSD
Matrix: Water
Analysis Batch: 198962

Client Sample ID: FC-CCR-MW71-120219
Prep Type: Total/NA
Prep Batch: 197604

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	0.50		1.00	1.52		mg/L		102	70 - 130	0	20

Method: 200.8 LL - Metals (ICP/MS)

Lab Sample ID: MB 550-197587/1-A
Matrix: Water
Analysis Batch: 198924

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 197587

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		12/10/19 05:37	12/24/19 13:56	1
Arsenic	ND		0.00050		mg/L		12/10/19 05:37	12/24/19 13:56	1
Barium	ND		0.00050		mg/L		12/10/19 05:37	12/24/19 13:56	1
Cadmium	ND		0.00010		mg/L		12/10/19 05:37	12/24/19 13:56	1
Cobalt	ND		0.00050		mg/L		12/10/19 05:37	12/24/19 13:56	1
Lead	ND		0.00050		mg/L		12/10/19 05:37	12/24/19 13:56	1
Molybdenum	ND		0.00050		mg/L		12/10/19 05:37	12/24/19 13:56	1
Selenium	ND		0.00050		mg/L		12/10/19 05:37	12/24/19 13:56	1
Thallium	ND		0.00010		mg/L		12/10/19 05:37	12/24/19 13:56	1

Method: 200.8 LL - Metals (ICP/MS)

Lab Sample ID: LCS 550-197587/2-A
Matrix: Water
Analysis Batch: 198924

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 197587

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.100	0.0981		mg/L		98	85 - 115
Arsenic	0.100	0.0929		mg/L		93	85 - 115
Barium	0.100	0.105		mg/L		105	85 - 115
Cadmium	0.100	0.0968		mg/L		97	85 - 115
Cobalt	0.100	0.0920		mg/L		92	85 - 115
Lead	0.100	0.0979		mg/L		98	85 - 115
Molybdenum	0.100	0.0936		mg/L		94	85 - 115
Selenium	0.100	0.0898		mg/L		90	85 - 115
Thallium	0.100	0.0969		mg/L		97	85 - 115

Lab Sample ID: LCSD 550-197587/3-A
Matrix: Water
Analysis Batch: 198924

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 197587

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	0.100	0.0955		mg/L		96	85 - 115	3	20
Arsenic	0.100	0.0918		mg/L		92	85 - 115	1	20
Barium	0.100	0.0886		mg/L		89	85 - 115	17	20
Cadmium	0.100	0.0957		mg/L		96	85 - 115	1	20
Cobalt	0.100	0.0894		mg/L		89	85 - 115	3	20
Lead	0.100	0.0928		mg/L		93	85 - 115	5	20
Molybdenum	0.100	0.0919		mg/L		92	85 - 115	2	20
Selenium	0.100	0.0876		mg/L		88	85 - 115	2	20
Thallium	0.100	0.0958		mg/L		96	85 - 115	1	20

Lab Sample ID: 550-134494-6 MS
Matrix: Water
Analysis Batch: 198924

Client Sample ID: FC-CCR-MW71-120219
Prep Type: Total/NA
Prep Batch: 197587

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	ND	D1	0.100	0.103		mg/L		102	70 - 130
Arsenic	0.0095	D1	0.100	0.109		mg/L		99	70 - 130
Barium	0.012	D1	0.100	0.113		mg/L		101	70 - 130
Cadmium	ND	D1	0.100	0.0956		mg/L		95	70 - 130
Cobalt	ND	D1	0.100	0.0904		mg/L		90	70 - 130
Lead	ND	D1	0.100	0.0934		mg/L		93	70 - 130
Molybdenum	ND	D1	0.100	0.0999		mg/L		99	70 - 130
Selenium	0.27	D1	0.100	0.340		mg/L		71	70 - 130
Thallium	0.00065	D1	0.100	0.0968		mg/L		96	70 - 130

Lab Sample ID: 550-134494-6 MSD
Matrix: Water
Analysis Batch: 198924

Client Sample ID: FC-CCR-MW71-120219
Prep Type: Total/NA
Prep Batch: 197587

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	ND	D1	0.100	0.112		mg/L		112	70 - 130	9	20
Arsenic	0.0095	D1	0.100	0.123		mg/L		113	70 - 130	12	20
Barium	0.012	D1	0.100	0.125		mg/L		113	70 - 130	10	20
Cadmium	ND	D1	0.100	0.103		mg/L		103	70 - 130	8	20

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Lab Sample ID: 550-134494-6 MSD — **Client Sample ID: FC-CCR-MW71-120219**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 198924 — **Prep Batch: 197587**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Cobalt	ND	D1	0.100	0.0978		mg/L		98	70 - 130	8	20
Lead	ND	D1	0.100	0.103		mg/L		103	70 - 130	10	20
Molybdenum	ND	D1	0.100	0.108		mg/L		107	70 - 130	8	20
Selenium	0.27	D1	0.100	0.368		mg/L		99	70 - 130	8	20
Thallium	0.00065	D1	0.100	0.105		mg/L		105	70 - 130	9	20

Lab Sample ID: MB 550-199028/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 199413 — **Prep Batch: 199028**

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		0.0010		mg/L		12/26/19 15:45	12/31/19 21:52	1

Lab Sample ID: LCS 550-199028/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 199413 — **Prep Batch: 199028**

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chromium			0.100	0.0977		mg/L		98	85 - 115		

Lab Sample ID: LCSD 550-199028/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 199413 — **Prep Batch: 199028**

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium			0.100	0.0958		mg/L		96	85 - 115	2	20

Lab Sample ID: 550-134494-6 MS — **Client Sample ID: FC-CCR-MW71-120219**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 199413 — **Prep Batch: 199028**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chromium	ND	D1	0.100	0.0979	D1	mg/L		98	70 - 130		

Lab Sample ID: 550-134494-6 MSD — **Client Sample ID: FC-CCR-MW71-120219**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 199413 — **Prep Batch: 199028**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium	ND	D1	0.100	0.101	D1	mg/L		101	70 - 130	4	20

Method: 245.1 - Mercury (CVAA)

Lab Sample ID: MB 550-198249/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 198264 — **Prep Batch: 198249**

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.00020		mg/L		12/17/19 14:08	12/17/19 17:20	1

Method: 245.1 - Mercury (CVAA) (Continued)

Lab Sample ID: LCS 550-198249/2-A
Matrix: Water
Analysis Batch: 198264

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 198249

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Hg			0.00500	0.00475		mg/L		95	85 - 115		

Lab Sample ID: LCSD 550-198249/3-A
Matrix: Water
Analysis Batch: 198264

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 198249

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Hg			0.00500	0.00476		mg/L		95	85 - 115	0	20

Lab Sample ID: 550-134494-6 MS
Matrix: Water
Analysis Batch: 198264

Client Sample ID: FC-CCR-MW71-120219
Prep Type: Total/NA
Prep Batch: 198249

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Hg	ND		0.00500	0.00496		mg/L		99	70 - 130		

Lab Sample ID: 550-134494-6 MSD
Matrix: Water
Analysis Batch: 198264

Client Sample ID: FC-CCR-MW71-120219
Prep Type: Total/NA
Prep Batch: 198249

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Hg	ND		0.00500	0.00498		mg/L		100	70 - 130	0	20

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

Lab Sample ID: MB 550-197607/1
Matrix: Water
Analysis Batch: 197607

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		20		mg/L			12/10/19 08:10	1

Lab Sample ID: LCS 550-197607/2
Matrix: Water
Analysis Batch: 197607

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Dissolved Solids			1000	960		mg/L		96	90 - 110		

Lab Sample ID: LCSD 550-197607/3
Matrix: Water
Analysis Batch: 197607

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids			1000	984		mg/L		98	90 - 110	2	10

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

Lab Sample ID: 550-134494-6 DU
Matrix: Water
Analysis Batch: 197607

Client Sample ID: FC-CCR-MW71-120219
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	16000	H1 D2		15200	D2 H1	mg/L				4	10

Lab Sample ID: 550-134500-A-1 DU
Matrix: Water
Analysis Batch: 197607

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	5000			5050		mg/L				2	10

Method: SM 4500 H+ B - pH

Lab Sample ID: LCSSRM 550-197831/13
Matrix: Water
Analysis Batch: 197831

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

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.1		SU		100.7	98.5 - 101.5		

Lab Sample ID: LCSSRM 550-197831/25
Matrix: Water
Analysis Batch: 197831

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

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.1		SU		101.1	98.5 - 101.5		

Lab Sample ID: LCSSRM 550-197831/36
Matrix: Water
Analysis Batch: 197831

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

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.1		SU		101.4	98.5 - 101.5		

Lab Sample ID: 550-134494-6 DU
Matrix: Water
Analysis Batch: 197831

Client Sample ID: FC-CCR-MW71-120219
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	7.2	H5		7.2	H5	SU				0	5
Temperature	12.0	H5		11.9	H5	Degrees C				0.8	

Lab Sample ID: 550-134500-A-1 DU
Matrix: Water
Analysis Batch: 197831

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	7.2	H5		7.3	H5	SU				0.3	5

QC Association Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-134494-1

HPLC/IC

Analysis Batch: 198331

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-134494-1	FC-CCR-MW66-120319	Total/NA	Water	300.0	
550-134494-1	FC-CCR-MW66-120319	Total/NA	Water	300.0	
550-134494-2	FC-CCR-MW67-120219	Total/NA	Water	300.0	
550-134494-2	FC-CCR-MW67-120219	Total/NA	Water	300.0	
550-134494-3	FC-CCR-MW68-120219	Total/NA	Water	300.0	
550-134494-3	FC-CCR-MW68-120219	Total/NA	Water	300.0	
550-134494-4	FC-CCR-MW69-120219	Total/NA	Water	300.0	
550-134494-4	FC-CCR-MW69-120219	Total/NA	Water	300.0	
550-134494-5	FC-CCR-MW70-120319	Total/NA	Water	300.0	
550-134494-5	FC-CCR-MW70-120319	Total/NA	Water	300.0	
550-134494-6	FC-CCR-MW71-120219	Total/NA	Water	300.0	
550-134494-6	FC-CCR-MW71-120219	Total/NA	Water	300.0	
550-134494-7	FC-CCR-MW72-120219	Total/NA	Water	300.0	
550-134494-7	FC-CCR-MW72-120219	Total/NA	Water	300.0	
550-134494-8	FC-CCR-MW73-120219	Total/NA	Water	300.0	
550-134494-8	FC-CCR-MW73-120219	Total/NA	Water	300.0	
550-134494-9	FC-CCR-MW83-120319	Total/NA	Water	300.0	
550-134494-9	FC-CCR-MW83-120319	Total/NA	Water	300.0	
550-134494-10	FC-CCR-FD01-120219	Total/NA	Water	300.0	
550-134494-10	FC-CCR-FD01-120219	Total/NA	Water	300.0	
550-134494-11	FC-CCR-MW84-120319	Total/NA	Water	300.0	
550-134494-11	FC-CCR-MW84-120319	Total/NA	Water	300.0	
550-134494-12	FC-CCR-MW85-120319	Total/NA	Water	300.0	
550-134494-12	FC-CCR-MW85-120319	Total/NA	Water	300.0	
550-134494-13	FC-CCR-MW86-120319	Total/NA	Water	300.0	
550-134494-13	FC-CCR-MW86-120319	Total/NA	Water	300.0	
550-134494-14	FC-CCR-FD02-120319	Total/NA	Water	300.0	
550-134494-14	FC-CCR-FD02-120319	Total/NA	Water	300.0	
MB 550-198331/2	Method Blank	Total/NA	Water	300.0	
LCS 550-198331/5	Lab Control Sample	Total/NA	Water	300.0	
LCSD 550-198331/6	Lab Control Sample Dup	Total/NA	Water	300.0	
550-134494-6 MS	FC-CCR-MW71-120219	Total/NA	Water	300.0	
550-134494-6 MS	FC-CCR-MW71-120219	Total/NA	Water	300.0	
550-134494-6 MSD	FC-CCR-MW71-120219	Total/NA	Water	300.0	
550-134494-6 MSD	FC-CCR-MW71-120219	Total/NA	Water	300.0	

Metals

Prep Batch: 197587

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-134494-1	FC-CCR-MW66-120319	Total/NA	Water	200.8	
550-134494-2	FC-CCR-MW67-120219	Total/NA	Water	200.8	
550-134494-3	FC-CCR-MW68-120219	Total/NA	Water	200.8	
550-134494-4	FC-CCR-MW69-120219	Total/NA	Water	200.8	
550-134494-5	FC-CCR-MW70-120319	Total/NA	Water	200.8	
550-134494-6	FC-CCR-MW71-120219	Total/NA	Water	200.8	
550-134494-7	FC-CCR-MW72-120219	Total/NA	Water	200.8	
550-134494-8	FC-CCR-MW73-120219	Total/NA	Water	200.8	
550-134494-9	FC-CCR-MW83-120319	Total/NA	Water	200.8	
550-134494-10	FC-CCR-FD01-120219	Total/NA	Water	200.8	
550-134494-11	FC-CCR-MW84-120319	Total/NA	Water	200.8	

Metals (Continued)

Prep Batch: 197587 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-134494-12	FC-CCR-MW85-120319	Total/NA	Water	200.8	
550-134494-13	FC-CCR-MW86-120319	Total/NA	Water	200.8	
550-134494-14	FC-CCR-FD02-120319	Total/NA	Water	200.8	
MB 550-197587/1-A	Method Blank	Total/NA	Water	200.8	
LCS 550-197587/2-A	Lab Control Sample	Total/NA	Water	200.8	
LCSD 550-197587/3-A	Lab Control Sample Dup	Total/NA	Water	200.8	
550-134494-6 MS	FC-CCR-MW71-120219	Total/NA	Water	200.8	
550-134494-6 MSD	FC-CCR-MW71-120219	Total/NA	Water	200.8	

Prep Batch: 197604

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-134494-1	FC-CCR-MW66-120319	Total/NA	Water	200.7	
550-134494-2	FC-CCR-MW67-120219	Total/NA	Water	200.7	
550-134494-3	FC-CCR-MW68-120219	Total/NA	Water	200.7	
550-134494-4	FC-CCR-MW69-120219	Total/NA	Water	200.7	
550-134494-5	FC-CCR-MW70-120319	Total/NA	Water	200.7	
550-134494-6	FC-CCR-MW71-120219	Total/NA	Water	200.7	
550-134494-7	FC-CCR-MW72-120219	Total/NA	Water	200.7	
550-134494-8	FC-CCR-MW73-120219	Total/NA	Water	200.7	
550-134494-9	FC-CCR-MW83-120319	Total/NA	Water	200.7	
550-134494-10	FC-CCR-FD01-120219	Total/NA	Water	200.7	
550-134494-11	FC-CCR-MW84-120319	Total/NA	Water	200.7	
550-134494-12	FC-CCR-MW85-120319	Total/NA	Water	200.7	
550-134494-13	FC-CCR-MW86-120319	Total/NA	Water	200.7	
550-134494-14	FC-CCR-FD02-120319	Total/NA	Water	200.7	
MB 550-197604/1-A	Method Blank	Total/NA	Water	200.7	
LCS 550-197604/2-A	Lab Control Sample	Total/NA	Water	200.7	
LCSD 550-197604/3-A	Lab Control Sample Dup	Total/NA	Water	200.7	
550-134494-6 MS	FC-CCR-MW71-120219	Total/NA	Water	200.7	
550-134494-6 MSD	FC-CCR-MW71-120219	Total/NA	Water	200.7	

Prep Batch: 198249

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-134494-1	FC-CCR-MW66-120319	Total/NA	Water	245.1	
550-134494-2	FC-CCR-MW67-120219	Total/NA	Water	245.1	
550-134494-3	FC-CCR-MW68-120219	Total/NA	Water	245.1	
550-134494-4	FC-CCR-MW69-120219	Total/NA	Water	245.1	
550-134494-5	FC-CCR-MW70-120319	Total/NA	Water	245.1	
550-134494-6	FC-CCR-MW71-120219	Total/NA	Water	245.1	
550-134494-7	FC-CCR-MW72-120219	Total/NA	Water	245.1	
550-134494-8	FC-CCR-MW73-120219	Total/NA	Water	245.1	
550-134494-9	FC-CCR-MW83-120319	Total/NA	Water	245.1	
550-134494-10	FC-CCR-FD01-120219	Total/NA	Water	245.1	
550-134494-11	FC-CCR-MW84-120319	Total/NA	Water	245.1	
550-134494-12	FC-CCR-MW85-120319	Total/NA	Water	245.1	
550-134494-13	FC-CCR-MW86-120319	Total/NA	Water	245.1	
550-134494-14	FC-CCR-FD02-120319	Total/NA	Water	245.1	
MB 550-198249/1-A	Method Blank	Total/NA	Water	245.1	
LCS 550-198249/2-A	Lab Control Sample	Total/NA	Water	245.1	
LCSD 550-198249/3-A	Lab Control Sample Dup	Total/NA	Water	245.1	
550-134494-6 MS	FC-CCR-MW71-120219	Total/NA	Water	245.1	

Metals (Continued)

Prep Batch: 198249 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-134494-6 MSD	FC-CCR-MW71-120219	Total/NA	Water	245.1	

Analysis Batch: 198264

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-134494-1	FC-CCR-MW66-120319	Total/NA	Water	245.1	198249
550-134494-2	FC-CCR-MW67-120219	Total/NA	Water	245.1	198249
550-134494-3	FC-CCR-MW68-120219	Total/NA	Water	245.1	198249
550-134494-4	FC-CCR-MW69-120219	Total/NA	Water	245.1	198249
550-134494-5	FC-CCR-MW70-120319	Total/NA	Water	245.1	198249
550-134494-6	FC-CCR-MW71-120219	Total/NA	Water	245.1	198249
550-134494-7	FC-CCR-MW72-120219	Total/NA	Water	245.1	198249
550-134494-8	FC-CCR-MW73-120219	Total/NA	Water	245.1	198249
550-134494-9	FC-CCR-MW83-120319	Total/NA	Water	245.1	198249
550-134494-10	FC-CCR-FD01-120219	Total/NA	Water	245.1	198249
550-134494-11	FC-CCR-MW84-120319	Total/NA	Water	245.1	198249
550-134494-12	FC-CCR-MW85-120319	Total/NA	Water	245.1	198249
550-134494-13	FC-CCR-MW86-120319	Total/NA	Water	245.1	198249
550-134494-14	FC-CCR-FD02-120319	Total/NA	Water	245.1	198249
MB 550-198249/1-A	Method Blank	Total/NA	Water	245.1	198249
LCS 550-198249/2-A	Lab Control Sample	Total/NA	Water	245.1	198249
LCSD 550-198249/3-A	Lab Control Sample Dup	Total/NA	Water	245.1	198249
550-134494-6 MS	FC-CCR-MW71-120219	Total/NA	Water	245.1	198249
550-134494-6 MSD	FC-CCR-MW71-120219	Total/NA	Water	245.1	198249

Analysis Batch: 198600

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-134494-8	FC-CCR-MW73-120219	Total/NA	Water	200.7 Rev 4.4	197604
550-134494-9	FC-CCR-MW83-120319	Total/NA	Water	200.7 Rev 4.4	197604
550-134494-10	FC-CCR-FD01-120219	Total/NA	Water	200.7 Rev 4.4	197604
550-134494-11	FC-CCR-MW84-120319	Total/NA	Water	200.7 Rev 4.4	197604
550-134494-12	FC-CCR-MW85-120319	Total/NA	Water	200.7 Rev 4.4	197604
550-134494-13	FC-CCR-MW86-120319	Total/NA	Water	200.7 Rev 4.4	197604
550-134494-14	FC-CCR-FD02-120319	Total/NA	Water	200.7 Rev 4.4	197604

Analysis Batch: 198848

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-134494-1	FC-CCR-MW66-120319	Total/NA	Water	200.7 Rev 4.4	197604
550-134494-2	FC-CCR-MW67-120219	Total/NA	Water	200.7 Rev 4.4	197604
550-134494-3	FC-CCR-MW68-120219	Total/NA	Water	200.7 Rev 4.4	197604
550-134494-4	FC-CCR-MW69-120219	Total/NA	Water	200.7 Rev 4.4	197604
550-134494-5	FC-CCR-MW70-120319	Total/NA	Water	200.7 Rev 4.4	197604
550-134494-6	FC-CCR-MW71-120219	Total/NA	Water	200.7 Rev 4.4	197604
550-134494-7	FC-CCR-MW72-120219	Total/NA	Water	200.7 Rev 4.4	197604
550-134494-8	FC-CCR-MW73-120219	Total/NA	Water	200.7 Rev 4.4	197604
550-134494-9	FC-CCR-MW83-120319	Total/NA	Water	200.7 Rev 4.4	197604
550-134494-10	FC-CCR-FD01-120219	Total/NA	Water	200.7 Rev 4.4	197604
550-134494-11	FC-CCR-MW84-120319	Total/NA	Water	200.7 Rev 4.4	197604
550-134494-12	FC-CCR-MW85-120319	Total/NA	Water	200.7 Rev 4.4	197604
550-134494-13	FC-CCR-MW86-120319	Total/NA	Water	200.7 Rev 4.4	197604
550-134494-14	FC-CCR-FD02-120319	Total/NA	Water	200.7 Rev 4.4	197604
MB 550-197604/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	197604

Metals (Continued)

Analysis Batch: 198848 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 550-197604/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	197604
LCSD 550-197604/3-A	Lab Control Sample Dup	Total/NA	Water	200.7 Rev 4.4	197604
550-134494-6 MS	FC-CCR-MW71-120219	Total/NA	Water	200.7 Rev 4.4	197604
550-134494-6 MSD	FC-CCR-MW71-120219	Total/NA	Water	200.7 Rev 4.4	197604

Analysis Batch: 198924

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-134494-1	FC-CCR-MW66-120319	Total/NA	Water	200.8 LL	197587
550-134494-1	FC-CCR-MW66-120319	Total/NA	Water	200.8 LL	197587
550-134494-2	FC-CCR-MW67-120219	Total/NA	Water	200.8 LL	197587
550-134494-2	FC-CCR-MW67-120219	Total/NA	Water	200.8 LL	197587
550-134494-3	FC-CCR-MW68-120219	Total/NA	Water	200.8 LL	197587
550-134494-3	FC-CCR-MW68-120219	Total/NA	Water	200.8 LL	197587
550-134494-4	FC-CCR-MW69-120219	Total/NA	Water	200.8 LL	197587
550-134494-5	FC-CCR-MW70-120319	Total/NA	Water	200.8 LL	197587
550-134494-6	FC-CCR-MW71-120219	Total/NA	Water	200.8 LL	197587
550-134494-7	FC-CCR-MW72-120219	Total/NA	Water	200.8 LL	197587
550-134494-8	FC-CCR-MW73-120219	Total/NA	Water	200.8 LL	197587
550-134494-9	FC-CCR-MW83-120319	Total/NA	Water	200.8 LL	197587
550-134494-10	FC-CCR-FD01-120219	Total/NA	Water	200.8 LL	197587
550-134494-11	FC-CCR-MW84-120319	Total/NA	Water	200.8 LL	197587
550-134494-12	FC-CCR-MW85-120319	Total/NA	Water	200.8 LL	197587
550-134494-13	FC-CCR-MW86-120319	Total/NA	Water	200.8 LL	197587
550-134494-14	FC-CCR-FD02-120319	Total/NA	Water	200.8 LL	197587
MB 550-197587/1-A	Method Blank	Total/NA	Water	200.8 LL	197587
LCS 550-197587/2-A	Lab Control Sample	Total/NA	Water	200.8 LL	197587
LCSD 550-197587/3-A	Lab Control Sample Dup	Total/NA	Water	200.8 LL	197587
550-134494-6 MS	FC-CCR-MW71-120219	Total/NA	Water	200.8 LL	197587
550-134494-6 MSD	FC-CCR-MW71-120219	Total/NA	Water	200.8 LL	197587

Analysis Batch: 198962

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-134494-6	FC-CCR-MW71-120219	Total/NA	Water	200.7 Rev 4.4	197604
550-134494-7	FC-CCR-MW72-120219	Total/NA	Water	200.7 Rev 4.4	197604
MB 550-197604/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	197604
LCS 550-197604/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	197604
LCSD 550-197604/3-A	Lab Control Sample Dup	Total/NA	Water	200.7 Rev 4.4	197604
550-134494-6 MS	FC-CCR-MW71-120219	Total/NA	Water	200.7 Rev 4.4	197604
550-134494-6 MSD	FC-CCR-MW71-120219	Total/NA	Water	200.7 Rev 4.4	197604

Prep Batch: 199028

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-134494-1	FC-CCR-MW66-120319	Total/NA	Water	200.8	
550-134494-2	FC-CCR-MW67-120219	Total/NA	Water	200.8	
550-134494-3	FC-CCR-MW68-120219	Total/NA	Water	200.8	
550-134494-4	FC-CCR-MW69-120219	Total/NA	Water	200.8	
550-134494-5	FC-CCR-MW70-120319	Total/NA	Water	200.8	
550-134494-6	FC-CCR-MW71-120219	Total/NA	Water	200.8	
550-134494-7	FC-CCR-MW72-120219	Total/NA	Water	200.8	
550-134494-8	FC-CCR-MW73-120219	Total/NA	Water	200.8	
550-134494-9	FC-CCR-MW83-120319	Total/NA	Water	200.8	

Metals (Continued)

Prep Batch: 199028 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-134494-10	FC-CCR-FD01-120219	Total/NA	Water	200.8	
550-134494-11	FC-CCR-MW84-120319	Total/NA	Water	200.8	
550-134494-12	FC-CCR-MW85-120319	Total/NA	Water	200.8	
550-134494-13	FC-CCR-MW86-120319	Total/NA	Water	200.8	
550-134494-14	FC-CCR-FD02-120319	Total/NA	Water	200.8	
MB 550-199028/1-A	Method Blank	Total/NA	Water	200.8	
LCS 550-199028/2-A	Lab Control Sample	Total/NA	Water	200.8	
LCSD 550-199028/3-A	Lab Control Sample Dup	Total/NA	Water	200.8	
550-134494-6 MS	FC-CCR-MW71-120219	Total/NA	Water	200.8	
550-134494-6 MSD	FC-CCR-MW71-120219	Total/NA	Water	200.8	

Analysis Batch: 199413

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-134494-1	FC-CCR-MW66-120319	Total/NA	Water	200.8 LL	199028
550-134494-2	FC-CCR-MW67-120219	Total/NA	Water	200.8 LL	199028
550-134494-3	FC-CCR-MW68-120219	Total/NA	Water	200.8 LL	199028
550-134494-4	FC-CCR-MW69-120219	Total/NA	Water	200.8 LL	199028
550-134494-5	FC-CCR-MW70-120319	Total/NA	Water	200.8 LL	199028
550-134494-6	FC-CCR-MW71-120219	Total/NA	Water	200.8 LL	199028
550-134494-7	FC-CCR-MW72-120219	Total/NA	Water	200.8 LL	199028
550-134494-8	FC-CCR-MW73-120219	Total/NA	Water	200.8 LL	199028
550-134494-9	FC-CCR-MW83-120319	Total/NA	Water	200.8 LL	199028
550-134494-10	FC-CCR-FD01-120219	Total/NA	Water	200.8 LL	199028
550-134494-11	FC-CCR-MW84-120319	Total/NA	Water	200.8 LL	199028
550-134494-12	FC-CCR-MW85-120319	Total/NA	Water	200.8 LL	199028
550-134494-13	FC-CCR-MW86-120319	Total/NA	Water	200.8 LL	199028
550-134494-14	FC-CCR-FD02-120319	Total/NA	Water	200.8 LL	199028
MB 550-199028/1-A	Method Blank	Total/NA	Water	200.8 LL	199028
LCS 550-199028/2-A	Lab Control Sample	Total/NA	Water	200.8 LL	199028
LCSD 550-199028/3-A	Lab Control Sample Dup	Total/NA	Water	200.8 LL	199028
550-134494-6 MS	FC-CCR-MW71-120219	Total/NA	Water	200.8 LL	199028
550-134494-6 MSD	FC-CCR-MW71-120219	Total/NA	Water	200.8 LL	199028

General Chemistry

Analysis Batch: 197607

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-134494-1	FC-CCR-MW66-120319	Total/NA	Water	SM 2540C	
550-134494-2	FC-CCR-MW67-120219	Total/NA	Water	SM 2540C	
550-134494-3	FC-CCR-MW68-120219	Total/NA	Water	SM 2540C	
550-134494-4	FC-CCR-MW69-120219	Total/NA	Water	SM 2540C	
550-134494-5	FC-CCR-MW70-120319	Total/NA	Water	SM 2540C	
550-134494-6	FC-CCR-MW71-120219	Total/NA	Water	SM 2540C	
550-134494-7	FC-CCR-MW72-120219	Total/NA	Water	SM 2540C	
550-134494-8	FC-CCR-MW73-120219	Total/NA	Water	SM 2540C	
550-134494-9	FC-CCR-MW83-120319	Total/NA	Water	SM 2540C	
550-134494-10	FC-CCR-FD01-120219	Total/NA	Water	SM 2540C	
550-134494-11	FC-CCR-MW84-120319	Total/NA	Water	SM 2540C	
550-134494-12	FC-CCR-MW85-120319	Total/NA	Water	SM 2540C	
550-134494-13	FC-CCR-MW86-120319	Total/NA	Water	SM 2540C	
550-134494-14	FC-CCR-FD02-120319	Total/NA	Water	SM 2540C	

General Chemistry (Continued)

Analysis Batch: 197607 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 550-197607/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 550-197607/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 550-197607/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	
550-134494-6 DU	FC-CCR-MW71-120219	Total/NA	Water	SM 2540C	
550-134500-A-1 DU	Duplicate	Total/NA	Water	SM 2540C	

Analysis Batch: 197831

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-134494-1	FC-CCR-MW66-120319	Total/NA	Water	SM 4500 H+ B	
550-134494-2	FC-CCR-MW67-120219	Total/NA	Water	SM 4500 H+ B	
550-134494-3	FC-CCR-MW68-120219	Total/NA	Water	SM 4500 H+ B	
550-134494-4	FC-CCR-MW69-120219	Total/NA	Water	SM 4500 H+ B	
550-134494-5	FC-CCR-MW70-120319	Total/NA	Water	SM 4500 H+ B	
550-134494-6	FC-CCR-MW71-120219	Total/NA	Water	SM 4500 H+ B	
550-134494-7	FC-CCR-MW72-120219	Total/NA	Water	SM 4500 H+ B	
550-134494-8	FC-CCR-MW73-120219	Total/NA	Water	SM 4500 H+ B	
550-134494-9	FC-CCR-MW83-120319	Total/NA	Water	SM 4500 H+ B	
550-134494-10	FC-CCR-FD01-120219	Total/NA	Water	SM 4500 H+ B	
550-134494-11	FC-CCR-MW84-120319	Total/NA	Water	SM 4500 H+ B	
550-134494-12	FC-CCR-MW85-120319	Total/NA	Water	SM 4500 H+ B	
550-134494-13	FC-CCR-MW86-120319	Total/NA	Water	SM 4500 H+ B	
550-134494-14	FC-CCR-FD02-120319	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-197831/13	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-197831/25	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-197831/36	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
550-134494-6 DU	FC-CCR-MW71-120219	Total/NA	Water	SM 4500 H+ B	
550-134500-A-1 DU	Duplicate	Total/NA	Water	SM 4500 H+ B	

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-134494-1

Client Sample ID: FC-CCR-MW66-120319

Lab Sample ID: 550-134494-1

Date Collected: 12/03/19 14:45

Matrix: Water

Date Received: 12/09/19 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	198331	12/17/19 20:52	NEL	TAL PHX
Total/NA	Analysis	300.0		200	198331	12/17/19 21:10	NEL	TAL PHX
Total/NA	Prep	200.7			197604	12/10/19 07:11	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198848	12/23/19 23:39	SRA	TAL PHX
Total/NA	Prep	200.8			197587	12/10/19 05:37	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		2	198924	12/24/19 14:10	ARE	TAL PHX
Total/NA	Prep	200.8			197587	12/10/19 05:37	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		4	198924	12/24/19 14:52	ARE	TAL PHX
Total/NA	Prep	200.8			199028	12/26/19 15:45	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		4	199413	12/31/19 22:04	ARE	TAL PHX
Total/NA	Prep	245.1			198249	12/17/19 14:08	BCV	TAL PHX
Total/NA	Analysis	245.1		1	198264	12/17/19 17:30	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	197607		YET	TAL PHX
					(Start)	12/10/19 08:10		
					(End)	12/11/19 09:50		
Total/NA	Analysis	SM 4500 H+ B		1	197831	12/12/19 14:14	MRR	TAL PHX

Client Sample ID: FC-CCR-MW67-120219

Lab Sample ID: 550-134494-2

Date Collected: 12/03/19 18:59

Matrix: Water

Date Received: 12/09/19 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	198331	12/17/19 21:29	NEL	TAL PHX
Total/NA	Analysis	300.0		200	198331	12/17/19 21:47	NEL	TAL PHX
Total/NA	Prep	200.7			197604	12/10/19 07:11	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198848	12/23/19 23:43	SRA	TAL PHX
Total/NA	Prep	200.8			197587	12/10/19 05:37	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		2	198924	12/24/19 14:12	ARE	TAL PHX
Total/NA	Prep	200.8			197587	12/10/19 05:37	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		4	198924	12/24/19 14:54	ARE	TAL PHX
Total/NA	Prep	200.8			199028	12/26/19 15:45	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		4	199413	12/31/19 22:06	ARE	TAL PHX
Total/NA	Prep	245.1			198249	12/17/19 14:08	BCV	TAL PHX
Total/NA	Analysis	245.1		1	198264	12/17/19 17:31	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	197607		YET	TAL PHX
					(Start)	12/10/19 08:10		
					(End)	12/11/19 09:50		
Total/NA	Analysis	SM 4500 H+ B		1	197831	12/12/19 14:14	MRR	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-134494-1

Client Sample ID: FC-CCR-MW68-120219

Lab Sample ID: 550-134494-3

Date Collected: 12/03/19 17:31

Matrix: Water

Date Received: 12/09/19 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	198331	12/17/19 22:06	NEL	TAL PHX
Total/NA	Analysis	300.0		200	198331	12/17/19 22:24	NEL	TAL PHX
Total/NA	Prep	200.7			197604	12/10/19 07:11	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198848	12/23/19 23:46	SRA	TAL PHX
Total/NA	Prep	200.8			197587	12/10/19 05:37	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		2	198924	12/24/19 14:14	ARE	TAL PHX
Total/NA	Prep	200.8			197587	12/10/19 05:37	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		4	198924	12/24/19 14:56	ARE	TAL PHX
Total/NA	Prep	200.8			199028	12/26/19 15:45	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		4	199413	12/31/19 22:08	ARE	TAL PHX
Total/NA	Prep	245.1			198249	12/17/19 14:08	BCV	TAL PHX
Total/NA	Analysis	245.1		1	198264	12/17/19 17:33	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	197607		YET	TAL PHX
					(Start)	12/10/19 08:10		
					(End)	12/11/19 09:50		
Total/NA	Analysis	SM 4500 H+ B		1	197831	12/12/19 14:14	MRR	TAL PHX

Client Sample ID: FC-CCR-MW69-120219

Lab Sample ID: 550-134494-4

Date Collected: 12/03/19 16:50

Matrix: Water

Date Received: 12/09/19 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	198331	12/17/19 23:19	NEL	TAL PHX
Total/NA	Analysis	300.0		200	198331	12/17/19 23:38	NEL	TAL PHX
Total/NA	Prep	200.7			197604	12/10/19 07:11	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198848	12/23/19 23:50	SRA	TAL PHX
Total/NA	Prep	200.8			197587	12/10/19 05:37	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		2	198924	12/24/19 14:21	ARE	TAL PHX
Total/NA	Prep	200.8			199028	12/26/19 15:45	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		4	199413	12/31/19 22:10	ARE	TAL PHX
Total/NA	Prep	245.1			198249	12/17/19 14:08	BCV	TAL PHX
Total/NA	Analysis	245.1		1	198264	12/17/19 17:34	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	197607		YET	TAL PHX
					(Start)	12/10/19 08:10		
					(End)	12/11/19 09:50		
Total/NA	Analysis	SM 4500 H+ B		1	197831	12/12/19 14:14	MRR	TAL PHX

Client Sample ID: FC-CCR-MW70-120319

Lab Sample ID: 550-134494-5

Date Collected: 12/03/19 15:45

Matrix: Water

Date Received: 12/09/19 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	198331	12/17/19 23:56	NEL	TAL PHX
Total/NA	Analysis	300.0		200	198331	12/18/19 00:14	NEL	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-134494-1

Client Sample ID: FC-CCR-MW70-120319
Date Collected: 12/03/19 15:45
Date Received: 12/09/19 10:20

Lab Sample ID: 550-134494-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			197604	12/10/19 07:11	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198848	12/23/19 23:54	SRA	TAL PHX
Total/NA	Prep	200.8			197587	12/10/19 05:37	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		2	198924	12/24/19 14:23	ARE	TAL PHX
Total/NA	Prep	200.8			199028	12/26/19 15:45	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		4	199413	12/31/19 22:13	ARE	TAL PHX
Total/NA	Prep	245.1			198249	12/17/19 14:08	BCV	TAL PHX
Total/NA	Analysis	245.1		1	198264	12/17/19 17:36	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	197607		YET	TAL PHX
					(Start)	12/10/19 08:10		
					(End)	12/11/19 09:50		
Total/NA	Analysis	SM 4500 H+ B		1	197831	12/12/19 14:14	MRR	TAL PHX

Client Sample ID: FC-CCR-MW71-120219
Date Collected: 12/02/19 15:06
Date Received: 12/09/19 10:20

Lab Sample ID: 550-134494-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	198331	12/18/19 00:33	NEL	TAL PHX
Total/NA	Analysis	300.0		200	198331	12/18/19 01:28	NEL	TAL PHX
Total/NA	Prep	200.7			197604	12/10/19 07:11	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198848	12/23/19 23:36	SRA	TAL PHX
Total/NA	Prep	200.7			197604	12/10/19 07:11	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198962	12/24/19 19:35	SRA	TAL PHX
Total/NA	Prep	200.8			197587	12/10/19 05:37	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		4	198924	12/24/19 14:06	ARE	TAL PHX
Total/NA	Prep	200.8			199028	12/26/19 15:45	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		4	199413	12/31/19 22:02	ARE	TAL PHX
Total/NA	Prep	245.1			198249	12/17/19 14:08	BCV	TAL PHX
Total/NA	Analysis	245.1		1	198264	12/17/19 17:28	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	197607		YET	TAL PHX
					(Start)	12/10/19 08:10		
					(End)	12/11/19 09:50		
Total/NA	Analysis	SM 4500 H+ B		1	197831	12/12/19 14:14	MRR	TAL PHX

Client Sample ID: FC-CCR-MW72-120219
Date Collected: 12/02/19 16:02
Date Received: 12/09/19 10:20

Lab Sample ID: 550-134494-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	198331	12/18/19 03:00	NEL	TAL PHX
Total/NA	Analysis	300.0		200	198331	12/18/19 03:18	NEL	TAL PHX
Total/NA	Prep	200.7			197604	12/10/19 07:11	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198848	12/24/19 00:03	SRA	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-134494-1

Client Sample ID: FC-CCR-MW72-120219

Lab Sample ID: 550-134494-7

Date Collected: 12/02/19 16:02

Matrix: Water

Date Received: 12/09/19 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			197604	12/10/19 07:11	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198962	12/24/19 19:38	SRA	TAL PHX
Total/NA	Prep	200.8			197587	12/10/19 05:37	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		2	198924	12/24/19 14:25	ARE	TAL PHX
Total/NA	Prep	200.8			199028	12/26/19 15:45	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		4	199413	12/31/19 22:15	ARE	TAL PHX
Total/NA	Prep	245.1			198249	12/17/19 14:08	BCV	TAL PHX
Total/NA	Analysis	245.1		1	198264	12/17/19 17:37	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	197607		YET	TAL PHX
					(Start)	12/10/19 08:10		
					(End)	12/11/19 09:50		
Total/NA	Analysis	SM 4500 H+ B		1	197831	12/12/19 14:14	MRR	TAL PHX

Client Sample ID: FC-CCR-MW73-120219

Lab Sample ID: 550-134494-8

Date Collected: 12/02/19 14:08

Matrix: Water

Date Received: 12/09/19 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	198331	12/18/19 03:37	NEL	TAL PHX
Total/NA	Analysis	300.0		200	198331	12/18/19 03:55	NEL	TAL PHX
Total/NA	Prep	200.7			197604	12/10/19 07:11	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198600	12/20/19 02:59	SRA	TAL PHX
Total/NA	Prep	200.7			197604	12/10/19 07:11	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198848	12/24/19 00:07	SRA	TAL PHX
Total/NA	Prep	200.8			197587	12/10/19 05:37	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		2	198924	12/24/19 14:27	ARE	TAL PHX
Total/NA	Prep	200.8			199028	12/26/19 15:45	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		4	199413	12/31/19 22:21	ARE	TAL PHX
Total/NA	Prep	245.1			198249	12/17/19 14:08	BCV	TAL PHX
Total/NA	Analysis	245.1		1	198264	12/17/19 17:39	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	197607		YET	TAL PHX
					(Start)	12/10/19 08:10		
					(End)	12/11/19 09:50		
Total/NA	Analysis	SM 4500 H+ B		1	197831	12/12/19 14:14	MRR	TAL PHX

Client Sample ID: FC-CCR-MW83-120319

Lab Sample ID: 550-134494-9

Date Collected: 12/02/19 09:52

Matrix: Water

Date Received: 12/09/19 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	198331	12/18/19 04:14	NEL	TAL PHX
Total/NA	Analysis	300.0		200	198331	12/18/19 04:32	NEL	TAL PHX
Total/NA	Prep	200.7			197604	12/10/19 07:11	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198600	12/20/19 03:03	SRA	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-134494-1

Client Sample ID: FC-CCR-MW83-120319

Lab Sample ID: 550-134494-9

Date Collected: 12/02/19 09:52

Matrix: Water

Date Received: 12/09/19 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			197604	12/10/19 07:11	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198848	12/24/19 00:10	SRA	TAL PHX
Total/NA	Prep	200.8			197587	12/10/19 05:37	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		2	198924	12/24/19 14:29	ARE	TAL PHX
Total/NA	Prep	200.8			199028	12/26/19 15:45	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		4	199413	12/31/19 22:23	ARE	TAL PHX
Total/NA	Prep	245.1			198249	12/17/19 14:08	BCV	TAL PHX
Total/NA	Analysis	245.1		1	198264	12/17/19 17:40	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	197607		YET	TAL PHX
					(Start)	12/10/19 08:10		
					(End)	12/11/19 09:50		
Total/NA	Analysis	SM 4500 H+ B		1	197831	12/12/19 14:14	MRR	TAL PHX

Client Sample ID: FC-CCR-FD01-120219

Lab Sample ID: 550-134494-10

Date Collected: 12/02/19 14:08

Matrix: Water

Date Received: 12/09/19 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	198331	12/18/19 04:50	NEL	TAL PHX
Total/NA	Analysis	300.0		200	198331	12/18/19 05:09	NEL	TAL PHX
Total/NA	Prep	200.7			197604	12/10/19 07:11	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198600	12/20/19 03:06	SRA	TAL PHX
Total/NA	Prep	200.7			197604	12/10/19 07:11	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198848	12/24/19 00:14	SRA	TAL PHX
Total/NA	Prep	200.8			197587	12/10/19 05:37	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		2	198924	12/24/19 14:31	ARE	TAL PHX
Total/NA	Prep	200.8			199028	12/26/19 15:45	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		4	199413	12/31/19 22:25	ARE	TAL PHX
Total/NA	Prep	245.1			198249	12/17/19 14:08	BCV	TAL PHX
Total/NA	Analysis	245.1		1	198264	12/17/19 17:42	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	197607		YET	TAL PHX
					(Start)	12/10/19 08:10		
					(End)	12/11/19 09:50		
Total/NA	Analysis	SM 4500 H+ B		1	197831	12/12/19 14:14	MRR	TAL PHX

Client Sample ID: FC-CCR-MW84-120319

Lab Sample ID: 550-134494-11

Date Collected: 12/03/19 07:57

Matrix: Water

Date Received: 12/09/19 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	198331	12/18/19 05:27	NEL	TAL PHX
Total/NA	Analysis	300.0		200	198331	12/18/19 05:46	NEL	TAL PHX
Total/NA	Prep	200.7			197604	12/10/19 07:11	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198600	12/20/19 03:10	SRA	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-134494-1

Client Sample ID: FC-CCR-MW84-120319
Date Collected: 12/03/19 07:57
Date Received: 12/09/19 10:20

Lab Sample ID: 550-134494-11
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			197604	12/10/19 07:11	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198848	12/24/19 00:17	SRA	TAL PHX
Total/NA	Prep	200.8			197587	12/10/19 05:37	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		2	198924	12/24/19 14:33	ARE	TAL PHX
Total/NA	Prep	200.8			199028	12/26/19 15:45	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		4	199413	12/31/19 22:27	ARE	TAL PHX
Total/NA	Prep	245.1			198249	12/17/19 14:08	BCV	TAL PHX
Total/NA	Analysis	245.1		1	198264	12/17/19 17:59	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	197607		YET	TAL PHX
					(Start)	12/10/19 08:10		
					(End)	12/11/19 09:50		
Total/NA	Analysis	SM 4500 H+ B		1	197831	12/12/19 14:14	MRR	TAL PHX

Client Sample ID: FC-CCR-MW85-120319
Date Collected: 12/03/19 08:47
Date Received: 12/09/19 10:20

Lab Sample ID: 550-134494-12
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	198331	12/18/19 06:41	NEL	TAL PHX
Total/NA	Analysis	300.0		200	198331	12/18/19 06:59	NEL	TAL PHX
Total/NA	Prep	200.7			197604	12/10/19 07:11	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198600	12/20/19 03:14	SRA	TAL PHX
Total/NA	Prep	200.7			197604	12/10/19 07:11	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198848	12/24/19 00:21	SRA	TAL PHX
Total/NA	Prep	200.8			197587	12/10/19 05:37	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		2	198924	12/24/19 14:35	ARE	TAL PHX
Total/NA	Prep	200.8			199028	12/26/19 15:45	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		4	199413	12/31/19 22:29	ARE	TAL PHX
Total/NA	Prep	245.1			198249	12/17/19 14:08	BCV	TAL PHX
Total/NA	Analysis	245.1		1	198264	12/17/19 18:01	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	197607		YET	TAL PHX
					(Start)	12/10/19 08:10		
					(End)	12/11/19 09:50		
Total/NA	Analysis	SM 4500 H+ B		1	197831	12/12/19 14:14	MRR	TAL PHX

Client Sample ID: FC-CCR-MW86-120319
Date Collected: 12/03/19 13:56
Date Received: 12/09/19 10:20

Lab Sample ID: 550-134494-13
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	198331	12/18/19 07:18	NEL	TAL PHX
Total/NA	Analysis	300.0		200	198331	12/18/19 07:36	NEL	TAL PHX
Total/NA	Prep	200.7			197604	12/10/19 07:11	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198600	12/20/19 03:17	SRA	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-134494-1

Client Sample ID: FC-CCR-MW86-120319

Lab Sample ID: 550-134494-13

Date Collected: 12/03/19 13:56

Matrix: Water

Date Received: 12/09/19 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			197604	12/10/19 07:11	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198848	12/24/19 00:24	SRA	TAL PHX
Total/NA	Prep	200.8			197587	12/10/19 05:37	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		2	198924	12/24/19 14:37	ARE	TAL PHX
Total/NA	Prep	200.8			199028	12/26/19 15:45	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		4	199413	12/31/19 22:31	ARE	TAL PHX
Total/NA	Prep	245.1			198249	12/17/19 14:08	BCV	TAL PHX
Total/NA	Analysis	245.1		1	198264	12/17/19 18:02	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	197607		YET	TAL PHX
					(Start)	12/10/19 08:10		
					(End)	12/11/19 09:50		
Total/NA	Analysis	SM 4500 H+ B		1	197831	12/12/19 14:14	MRR	TAL PHX

Client Sample ID: FC-CCR-FD02-120319

Lab Sample ID: 550-134494-14

Date Collected: 12/03/19 14:45

Matrix: Water

Date Received: 12/09/19 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	198331	12/18/19 07:54	NEL	TAL PHX
Total/NA	Analysis	300.0		200	198331	12/18/19 08:13	NEL	TAL PHX
Total/NA	Prep	200.7			197604	12/10/19 07:11	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198600	12/20/19 03:21	SRA	TAL PHX
Total/NA	Prep	200.7			197604	12/10/19 07:11	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198848	12/24/19 00:28	SRA	TAL PHX
Total/NA	Prep	200.8			197587	12/10/19 05:37	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		2	198924	12/24/19 14:39	ARE	TAL PHX
Total/NA	Prep	200.8			199028	12/26/19 15:45	MGM	TAL PHX
Total/NA	Analysis	200.8 LL		4	199413	12/31/19 22:34	ARE	TAL PHX
Total/NA	Prep	245.1			198249	12/17/19 14:08	BCV	TAL PHX
Total/NA	Analysis	245.1		1	198264	12/17/19 18:04	BCV	TAL PHX
Total/NA	Analysis	SM 2540C		1	197607		YET	TAL PHX
					(Start)	12/10/19 08:10		
					(End)	12/11/19 09:50		
Total/NA	Analysis	SM 4500 H+ B		1	197831	12/12/19 14:14	MRR	TAL PHX

Laboratory References:

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

Accreditation/Certification Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-134494-1

Laboratory: Eurofins TestAmerica, Phoenix

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

Authority	Program	Identification Number	Expiration Date
Arizona	State Program	AZ0728	06-09-20

Method Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-134494-1

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL PHX
200.7 Rev 4.4	Metals (ICP)	40CFR136A	TAL PHX
200.8 LL	Metals (ICP/MS)	EPA	TAL PHX
245.1	Mercury (CVAA)	EPA	TAL PHX
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PHX
SM 4500 H+ B	pH	SM	TAL PHX
200.7	Preparation, Total Metals	EPA	TAL PHX
200.8	Preparation, Total Metals	EPA	TAL PHX
245.1	Preparation, Mercury	EPA	TAL PHX

Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.
EPA = US Environmental Protection Agency
MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
SM = "Standard Methods For The Examination Of Water And Wastewater"

Laboratory References:

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

TestAmerica Phoenix
4645 E Cotton Ctr Blvd Bdg 3
Phoenix, AZ 85040
phone 602.437.3340 fax 623.445.6192

134494

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Jim Edwards	Site Contact: Jim Edwards	Date:	COC No:
APS Four Corners	Tel/Fax: 928-386-0302	Lab Contact: Ken Baker	Carrier:	1 of 2 COCs
PO Box 355, MS 4915	Analysis Turnaround Time			Job No.
Fruitland, NM 87416	Calendar (C) or Work Days (W)			
Phone:	TAT if different from Below 7 Days			
Fax:	☐ 2 weeks			
Project Name: CCR	☐ 1 week			
E-Mail Address:	☐ 2 days			
	☐ 1 day			

550-134494 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	Perform MS / MSD (Y / N)	EPA 200.7 (B, Be, Ca, Li)	EPA 300.0 (Cl, F, SO4)	SM 2450C (TDS)	SM 4500HB (pH)	200.8 (Sb, As, Ba, Cd, Cr, Co, Pb, Mo, Se, Tl)	EPA 245.1 (Hg)	Sample Specific Notes:
FC-CCR-MW66- 120319	12/03/19	14:45	G	W	4	N		X	X	X	X	X	X	low flow -01
FC-CCR-MW67- 120219	12/02/19	18:59	G	W		N		X	X	X	X	X	X	-02
FC-CCR-MW68- 120219	12/02/19	17:31	G	W		N		X	X	X	X	X	X	-03
FC-CCR-MW69- 120219	12/02/19	16:50	G	W		N		X	X	X	X	X	X	-04
FC-CCR-MW70- 120319	12/03/19	15:45	G	W		N		X	X	X	X	X	X	-05
FC-CCR-MW71- 120219	12/02/19	15:06	G	W		N	X	X	X	X	X	X	X	-06
FC-CCR-MW72- 120219	12/02/19	16:02	G	W		N		X	X	X	X	X	X	-07
FC-CCR-MW73- 120219	12/2/19	14:08	G	W		N		X	X	X	X	X	X	-08
FC-CCR-MW83- 120319	12/03/19	09:52	G	W		N		X	X	X	X	X	X	-09
FC-CCR-FD01- 120219	12/2/19	14:08	G	W		N		X	X	X	X	X	X	-10

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Special Instructions/QC Requirements & Comments:
Method 200.8 with collision cell
Radium to be analyzed by Radiation Safety

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Wood	12/06/19 @ 15:30		Wood	12/6/19 1930
	Wood	1021 12/8/19			
			TA-PHX		12-09-19 10:20

Temp 2-0-c, 2-6-c

1/7/2020

TestAmerica Phoenix
4645 E Cotton Ctr Blvd Bdg 3
Phoenix, AZ 85040
phone 602.437.3340 fax 623.445.6192

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

1/7/2020

Client Contact	Project Manager: Jim Edwards	Site Contact: Jim Edwards	Date:	COC No:
APS Four Corners	Tel/Fax: 928-386-0302	Lab Contact: Ken Baker	Carrier:	2 of 2 COCs
PO Box 355, MS 4915	Analysis Turnaround Time			Job No.
Fruitland, NM 87416	Calendar (C) or Work Days (W)			
Phone:	TAT if different from Below 7 Days			SDG No.
Fax:	☒ 2 weeks			
Project Name: CCR	☒ 1 week			
E-Mail Address:	☐ 2 days			
	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	Perform MS / MSD (Y / N)	EPA 200.7 (B, Be, Ca, Li)	200.8 (Sb, As, Ba, Cd, Cr, Co, Pb, Mo, Se, Tl)	EPA 300.0 (Cl, F, SO4)	SM 4500-HB (pH)	SM 2540C (TDS)	EPA 245.1 (Hg)	Sample Specific Notes:
FC-CCR-MW84- 120319	12/03/19	07:57	G	W	4	N		X	X	X	X	X	X	low flow -11
FC-CCR-MW85- 120319	12/03/19	08:47	G	W	|	N		X	X	X	X	X	X	-12
FC-CCR-MW86- 120319	12/03/19	13:56	G	W	|	N		X	X	X	X	X	X	-13
FC-CCR-FD02- 120319	12/03/19	14:45	G	W	|	N		X	X	X	X	X	X	-14

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Special Instructions/QC Requirements & Comments:
Method 200.8 with collision cell
Radium to be analyzed by Radiation Safety

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Wood	12/6/19 19:30		Wood	12/6/19 1930
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Wood	12/8/19 1021			
Relinquished by:	Company:	Date/Time:	Received by: TA-PHX	Company: TA PHX	Date/Time: 12-09-19 10:21
	CDD				

Temp 2-0-C, 2-6-C

Login Sample Receipt Checklist

Client: Arizona Public Service Company

Job Number: 550-134494-1

Login Number: 134494
List Number: 1
Creator: Gravlin, Andrea

List Source: Eurofins TestAmerica, Phoenix

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

eurofins | Environment Testing TestAmerica



ANALYTICAL REPORT

Eurofins TestAmerica, Phoenix
4625 East Cotton Ctr Blvd
Suite 189
Phoenix, AZ 85040
Tel: (602)437-3340

Laboratory Job ID: 550-134500-1
Client Project/Site: CCR

For:
Arizona Public Service Company
PO BOX 188, Ste. 4458
Joseph City, Arizona 86032

Attn: Jim Edwards

Authorized for release by:
12/27/2019 11:24:15 AM

Ken Baker, Project Manager II
(602)659-7624
ken.baker@testamericainc.com

LINKS

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Visit us at: www.testamericainc.com

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

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

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Definitions/Glossary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-134500-1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
D1	Sample required dilution due to matrix.

Metals

Qualifier	Qualifier Description
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated blank spike was acceptable.

General Chemistry

Qualifier	Qualifier Description
D2	Sample required dilution due to high concentration of analyte.
H5	This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.

Glossary

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

Job ID: 550-134500-1

Laboratory: Eurofins TestAmerica, Phoenix

Narrative

Job Narrative
550-134500-1

Comments
No additional comments.

Receipt
The samples were received on 12/9/2019 10:21 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.6º C.

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

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

General Chemistry
Method SM 2540C: The following samples were received with less than 2 days remaining on the holding time or less than one shift (8 hours) remaining on a test with a holding time of 48 hours or less. As such, the laboratory had insufficient time remaining to perform the analysis within holding time: (550-134494-A-6) and (550-134494-A-6 DU).

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

Sample Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-134500-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
550-134500-1	FC-CCR-MW62-120319	Water	12/03/19 13:22	12/09/19 10:21	
550-134500-2	FC-CCR-MW63-120319	Water	12/03/19 10:40	12/09/19 10:21	
550-134500-3	FC-CCR-MW64-120319	Water	12/03/19 11:17	12/09/19 10:21	
550-134500-4	FC-CCR-FD01-120319	Water	12/03/19 10:40	12/09/19 10:21	
550-134500-5	FC-CCR-MW65-120319	Water	12/03/19 12:43	12/09/19 10:21	

Detection Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-134500-1

Client Sample ID: FC-CCR-MW62-120319 — Lab Sample ID: 550-134500-1

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	1.5	D1	0.80		mg/L	2		300.0	Total/NA
Boron	2.1		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	530	M3	2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Total Dissolved Solids	5000	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.2	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW63-120319 — Lab Sample ID: 550-134500-2

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	1.8	D1	0.80		mg/L	2		300.0	Total/NA
Boron	1.5		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	550		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Total Dissolved Solids	4300	D2	40		mg/L	1		SM 2540C	Total/NA
pH	7.1	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW64-120319 — Lab Sample ID: 550-134500-3

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	1.5		0.40		mg/L	1		300.0	Total/NA
Boron	0.56		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	82		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Total Dissolved Solids	720		20		mg/L	1		SM 2540C	Total/NA
pH	7.8	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-FD01-120319 — Lab Sample ID: 550-134500-4

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	1.8	D1	0.80		mg/L	2		300.0	Total/NA
Boron	1.6		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	560		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Total Dissolved Solids	4100	D2	40		mg/L	1		SM 2540C	Total/NA
pH	7.2	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW65-120319 — Lab Sample ID: 550-134500-5

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	1.9		0.40		mg/L	1		300.0	Total/NA
Boron	0.65		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	89		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Total Dissolved Solids	850		20		mg/L	1		SM 2540C	Total/NA
pH	7.6	H5	1.7		SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-MW62-120319

Lab Sample ID: 550-134500-1
Date Collected: 12/03/19 13:22
Matrix: Water
Date Received: 12/09/19 10:21

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	1.5	D1	0.80		mg/L			12/18/19 09:08	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	2.1		0.050		mg/L		12/10/19 07:18	12/23/19 22:33	1
Calcium	530	M3	2.0		mg/L		12/10/19 07:18	12/23/19 22:33	1
Lithium	ND		0.20		mg/L		12/10/19 07:18	12/20/19 03:49	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	5000	D2	100		mg/L			12/10/19 08:10	1
pH	7.2	H5	1.7		SU			12/12/19 14:14	1

Client Sample ID: FC-CCR-MW63-120319

Lab Sample ID: 550-134500-2
Date Collected: 12/03/19 10:40
Matrix: Water
Date Received: 12/09/19 10:21

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	1.8	D1	0.80		mg/L			12/09/19 23:31	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.5		0.050		mg/L		12/10/19 07:18	12/23/19 22:36	1
Calcium	550		2.0		mg/L		12/10/19 07:18	12/23/19 22:36	1
Lithium	ND		0.20		mg/L		12/10/19 07:18	12/20/19 03:53	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	4300	D2	40		mg/L			12/10/19 08:10	1
pH	7.1	H5	1.7		SU			12/12/19 14:14	1

Client Sample ID: FC-CCR-MW64-120319

Lab Sample ID: 550-134500-3
Date Collected: 12/03/19 11:17
Matrix: Water
Date Received: 12/09/19 10:21

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	1.5		0.40		mg/L			12/10/19 00:54	1

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.56		0.050		mg/L		12/10/19 07:18	12/23/19 22:40	1
Calcium	82		2.0		mg/L		12/10/19 07:18	12/23/19 22:40	1
Lithium	ND		0.20		mg/L		12/10/19 07:18	12/20/19 03:56	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	720		20		mg/L			12/10/19 08:10	1
pH	7.8	H5	1.7		SU			12/12/19 14:14	1

Client Sample Results

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-134500-1

Client Sample ID: FC-CCR-FD01-120319

Lab Sample ID: 550-134500-4

Date Collected: 12/03/19 10:40
Matrix: Water
Date Received: 12/09/19 10:21

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	1.8	D1	0.80		mg/L			12/10/19 01:21	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.6		0.050		mg/L		12/10/19 07:18	12/23/19 22:43	1
Calcium	560		2.0		mg/L		12/10/19 07:18	12/23/19 22:43	1
Lithium	ND		0.20		mg/L		12/10/19 07:18	12/20/19 03:59	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	4100	D2	40		mg/L			12/10/19 08:10	1
pH	7.2	H5	1.7		SU			12/12/19 14:14	1

Client Sample ID: FC-CCR-MW65-120319

Lab Sample ID: 550-134500-5

Date Collected: 12/03/19 12:43
Matrix: Water
Date Received: 12/09/19 10:21

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	1.9		0.40		mg/L			12/10/19 01:48	1

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.65		0.050		mg/L		12/10/19 07:18	12/23/19 22:46	1
Calcium	89		2.0		mg/L		12/10/19 07:18	12/23/19 22:46	1
Lithium	ND		0.20		mg/L		12/10/19 07:18	12/20/19 04:02	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	850		20		mg/L			12/10/19 08:10	1
pH	7.6	H5	1.7		SU			12/12/19 14:14	1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 550-197653/2
Matrix: Water
Analysis Batch: 197653

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.40		mg/L			12/09/19 17:08	1

Lab Sample ID: LCS 550-197653/5
Matrix: Water
Analysis Batch: 197653

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride			4.00	4.08		mg/L		102	90 - 110		

Lab Sample ID: LCSD 550-197653/6
Matrix: Water
Analysis Batch: 197653

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride			4.00	4.02		mg/L		101	90 - 110	1	20

Lab Sample ID: 550-134500-3 MS
Matrix: Water
Analysis Batch: 197653

Client Sample ID: FC-CCR-MW64-120319
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride	1.5		4.00	5.52		mg/L		102	80 - 120		

Lab Sample ID: 550-134500-3 MSD
Matrix: Water
Analysis Batch: 197653

Client Sample ID: FC-CCR-MW64-120319
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	1.5		4.00	5.51		mg/L		101	80 - 120	0	20

Lab Sample ID: MB 550-198331/2
Matrix: Water
Analysis Batch: 198331

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.40		mg/L			12/17/19 18:06	1

Lab Sample ID: LCS 550-198331/5
Matrix: Water
Analysis Batch: 198331

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride			4.00	4.09		mg/L		102	90 - 110		

Lab Sample ID: LCSD 550-198331/6
Matrix: Water
Analysis Batch: 198331

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride			4.00	4.10		mg/L		102	90 - 110	0	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: 550-134500-1 MS
Matrix: Water
Analysis Batch: 198331

Client Sample ID: FC-CCR-MW62-120319
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	1.5	D1	8.00	9.93	D1	mg/L		105	80 - 120

Lab Sample ID: 550-134500-1 MSD
Matrix: Water
Analysis Batch: 198331

Client Sample ID: FC-CCR-MW62-120319
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	1.5	D1	8.00	10.1	D1	mg/L		107	80 - 120	1	20

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 550-197605/1-A
Matrix: Water
Analysis Batch: 198601

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 197605

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		0.20		mg/L		12/10/19 07:18	12/20/19 03:34	1

Lab Sample ID: MB 550-197605/1-A
Matrix: Water
Analysis Batch: 198963

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 197605

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.050		mg/L		12/10/19 07:18	12/24/19 19:42	1
Calcium	ND		2.0		mg/L		12/10/19 07:18	12/24/19 19:42	1

Lab Sample ID: LCS 550-197605/2-A
Matrix: Water
Analysis Batch: 198601

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 197605

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Lithium			1.00	0.963		mg/L		96	85 - 115

Lab Sample ID: LCS 550-197605/2-A
Matrix: Water
Analysis Batch: 198847

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 197605

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron			1.00	0.992		mg/L		99	85 - 115
Calcium			21.0	22.1		mg/L		105	85 - 115

Lab Sample ID: LCSD 550-197605/3-A
Matrix: Water
Analysis Batch: 198601

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 197605

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Lithium			1.00	0.952		mg/L		95	85 - 115	1	20

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: LCSD 550-197605/3-A
Matrix: Water
Analysis Batch: 198847

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 197605

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron			1.00	0.987		mg/L		99	85 - 115	0	20
Calcium			21.0	22.0		mg/L		105	85 - 115	0	20

Lab Sample ID: 550-134500-1 MS
Matrix: Water
Analysis Batch: 198601

Client Sample ID: FC-CCR-MW62-120319
Prep Type: Total/NA
Prep Batch: 197605

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Lithium	ND		1.00	1.08		mg/L		98	70 - 130

Lab Sample ID: 550-134500-1 MS
Matrix: Water
Analysis Batch: 198847

Client Sample ID: FC-CCR-MW62-120319
Prep Type: Total/NA
Prep Batch: 197605

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	2.1		1.00	3.05		mg/L		97	70 - 130
Calcium	530	M3	21.0	535	M3	mg/L		32	70 - 130

Lab Sample ID: 550-134500-1 MSD
Matrix: Water
Analysis Batch: 198601

Client Sample ID: FC-CCR-MW62-120319
Prep Type: Total/NA
Prep Batch: 197605

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Lithium	ND		1.00	1.06		mg/L		96	70 - 130	2	20

Lab Sample ID: 550-134500-1 MSD
Matrix: Water
Analysis Batch: 198847

Client Sample ID: FC-CCR-MW62-120319
Prep Type: Total/NA
Prep Batch: 197605

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	2.1		1.00	3.03		mg/L		95	70 - 130	1	20
Calcium	530	M3	21.0	521	M3	mg/L		-35	70 - 130	3	20

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

Lab Sample ID: MB 550-197607/1
Matrix: Water
Analysis Batch: 197607

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		20		mg/L			12/10/19 08:10	1

Lab Sample ID: LCS 550-197607/2
Matrix: Water
Analysis Batch: 197607

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids			1000	960		mg/L		96	90 - 110

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

Lab Sample ID: LCSD 550-197607/3
Matrix: Water
Analysis Batch: 197607

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids			1000	984		mg/L		98	90 - 110	2	10

Lab Sample ID: 550-134500-1 DU
Matrix: Water
Analysis Batch: 197607

Client Sample ID: FC-CCR-MW62-120319
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	5000	D2		5050	D2	mg/L				2	10

Method: SM 4500 H+ B - pH

Lab Sample ID: LCSSRM 550-197831/25
Matrix: Water
Analysis Batch: 197831

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

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.1		SU		101.1	98.5 - 101.5		

Lab Sample ID: LCSSRM 550-197831/36
Matrix: Water
Analysis Batch: 197831

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

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.1		SU		101.4	98.5 - 101.5		

Lab Sample ID: 550-134500-1 DU
Matrix: Water
Analysis Batch: 197831

Client Sample ID: FC-CCR-MW62-120319
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	7.2	H5		7.3	H5	SU				0.3	5
Temperature	13.1	H5		12.9	H5	Degrees C				2	

HPLC/IC

Analysis Batch: 197653

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-134500-2	FC-CCR-MW63-120319	Total/NA	Water	300.0	
550-134500-3	FC-CCR-MW64-120319	Total/NA	Water	300.0	
550-134500-4	FC-CCR-FD01-120319	Total/NA	Water	300.0	
550-134500-5	FC-CCR-MW65-120319	Total/NA	Water	300.0	
MB 550-197653/2	Method Blank	Total/NA	Water	300.0	
LCS 550-197653/5	Lab Control Sample	Total/NA	Water	300.0	
LCSD 550-197653/6	Lab Control Sample Dup	Total/NA	Water	300.0	
550-134500-3 MS	FC-CCR-MW64-120319	Total/NA	Water	300.0	
550-134500-3 MSD	FC-CCR-MW64-120319	Total/NA	Water	300.0	

Analysis Batch: 198331

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-134500-1	FC-CCR-MW62-120319	Total/NA	Water	300.0	
MB 550-198331/2	Method Blank	Total/NA	Water	300.0	
LCS 550-198331/5	Lab Control Sample	Total/NA	Water	300.0	
LCSD 550-198331/6	Lab Control Sample Dup	Total/NA	Water	300.0	
550-134500-1 MS	FC-CCR-MW62-120319	Total/NA	Water	300.0	
550-134500-1 MSD	FC-CCR-MW62-120319	Total/NA	Water	300.0	

Metals

Prep Batch: 197605

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-134500-1	FC-CCR-MW62-120319	Total/NA	Water	200.7	
550-134500-2	FC-CCR-MW63-120319	Total/NA	Water	200.7	
550-134500-3	FC-CCR-MW64-120319	Total/NA	Water	200.7	
550-134500-4	FC-CCR-FD01-120319	Total/NA	Water	200.7	
550-134500-5	FC-CCR-MW65-120319	Total/NA	Water	200.7	
MB 550-197605/1-A	Method Blank	Total/NA	Water	200.7	
LCS 550-197605/2-A	Lab Control Sample	Total/NA	Water	200.7	
LCSD 550-197605/3-A	Lab Control Sample Dup	Total/NA	Water	200.7	
550-134500-1 MS	FC-CCR-MW62-120319	Total/NA	Water	200.7	
550-134500-1 MSD	FC-CCR-MW62-120319	Total/NA	Water	200.7	

Analysis Batch: 198601

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-134500-1	FC-CCR-MW62-120319	Total/NA	Water	200.7 Rev 4.4	197605
550-134500-2	FC-CCR-MW63-120319	Total/NA	Water	200.7 Rev 4.4	197605
550-134500-3	FC-CCR-MW64-120319	Total/NA	Water	200.7 Rev 4.4	197605
550-134500-4	FC-CCR-FD01-120319	Total/NA	Water	200.7 Rev 4.4	197605
550-134500-5	FC-CCR-MW65-120319	Total/NA	Water	200.7 Rev 4.4	197605
MB 550-197605/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	197605
LCS 550-197605/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	197605
LCSD 550-197605/3-A	Lab Control Sample Dup	Total/NA	Water	200.7 Rev 4.4	197605
550-134500-1 MS	FC-CCR-MW62-120319	Total/NA	Water	200.7 Rev 4.4	197605
550-134500-1 MSD	FC-CCR-MW62-120319	Total/NA	Water	200.7 Rev 4.4	197605

Analysis Batch: 198847

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-134500-1	FC-CCR-MW62-120319	Total/NA	Water	200.7 Rev 4.4	197605
550-134500-2	FC-CCR-MW63-120319	Total/NA	Water	200.7 Rev 4.4	197605

QC Association Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-134500-1

Metals (Continued)

Analysis Batch: 198847 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-134500-3	FC-CCR-MW64-120319	Total/NA	Water	200.7 Rev 4.4	197605
550-134500-4	FC-CCR-FD01-120319	Total/NA	Water	200.7 Rev 4.4	197605
550-134500-5	FC-CCR-MW65-120319	Total/NA	Water	200.7 Rev 4.4	197605
LCS 550-197605/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	197605
LCSD 550-197605/3-A	Lab Control Sample Dup	Total/NA	Water	200.7 Rev 4.4	197605
550-134500-1 MS	FC-CCR-MW62-120319	Total/NA	Water	200.7 Rev 4.4	197605
550-134500-1 MSD	FC-CCR-MW62-120319	Total/NA	Water	200.7 Rev 4.4	197605

Analysis Batch: 198963

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 550-197605/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	197605

General Chemistry

Analysis Batch: 197607

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-134500-1	FC-CCR-MW62-120319	Total/NA	Water	SM 2540C	
550-134500-2	FC-CCR-MW63-120319	Total/NA	Water	SM 2540C	
550-134500-3	FC-CCR-MW64-120319	Total/NA	Water	SM 2540C	
550-134500-4	FC-CCR-FD01-120319	Total/NA	Water	SM 2540C	
550-134500-5	FC-CCR-MW65-120319	Total/NA	Water	SM 2540C	
MB 550-197607/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 550-197607/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 550-197607/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	
550-134500-1 DU	FC-CCR-MW62-120319	Total/NA	Water	SM 2540C	

Analysis Batch: 197831

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-134500-1	FC-CCR-MW62-120319	Total/NA	Water	SM 4500 H+ B	
550-134500-2	FC-CCR-MW63-120319	Total/NA	Water	SM 4500 H+ B	
550-134500-3	FC-CCR-MW64-120319	Total/NA	Water	SM 4500 H+ B	
550-134500-4	FC-CCR-FD01-120319	Total/NA	Water	SM 4500 H+ B	
550-134500-5	FC-CCR-MW65-120319	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-197831/25	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-197831/36	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
550-134500-1 DU	FC-CCR-MW62-120319	Total/NA	Water	SM 4500 H+ B	

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-134500-1

Client Sample ID: FC-CCR-MW62-120319

Lab Sample ID: 550-134500-1

Date Collected: 12/03/19 13:22

Matrix: Water

Date Received: 12/09/19 10:21

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	198331	12/18/19 09:08	NEL	TAL PHX
Total/NA	Prep	200.7			197605	12/10/19 07:18	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198601	12/20/19 03:49	SRA	TAL PHX
Total/NA	Prep	200.7			197605	12/10/19 07:18	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198847	12/23/19 22:33	SRA	TAL PHX
Total/NA	Analysis	SM 2540C		1	197607		YET	TAL PHX
						(Start) 12/10/19 08:10		
						(End) 12/11/19 09:50		
Total/NA	Analysis	SM 4500 H+ B		1	197831	12/12/19 14:14	MRR	TAL PHX

Client Sample ID: FC-CCR-MW63-120319

Lab Sample ID: 550-134500-2

Date Collected: 12/03/19 10:40

Matrix: Water

Date Received: 12/09/19 10:21

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	197653	12/09/19 23:31	NEL	TAL PHX
Total/NA	Prep	200.7			197605	12/10/19 07:18	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198601	12/20/19 03:53	SRA	TAL PHX
Total/NA	Prep	200.7			197605	12/10/19 07:18	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198847	12/23/19 22:36	SRA	TAL PHX
Total/NA	Analysis	SM 2540C		1	197607		YET	TAL PHX
						(Start) 12/10/19 08:10		
						(End) 12/11/19 09:50		
Total/NA	Analysis	SM 4500 H+ B		1	197831	12/12/19 14:14	MRR	TAL PHX

Client Sample ID: FC-CCR-MW64-120319

Lab Sample ID: 550-134500-3

Date Collected: 12/03/19 11:17

Matrix: Water

Date Received: 12/09/19 10:21

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	197653	12/10/19 00:54	NEL	TAL PHX
Total/NA	Prep	200.7			197605	12/10/19 07:18	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198601	12/20/19 03:56	SRA	TAL PHX
Total/NA	Prep	200.7			197605	12/10/19 07:18	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198847	12/23/19 22:40	SRA	TAL PHX
Total/NA	Analysis	SM 2540C		1	197607		YET	TAL PHX
						(Start) 12/10/19 08:10		
						(End) 12/11/19 09:50		
Total/NA	Analysis	SM 4500 H+ B		1	197831	12/12/19 14:14	MRR	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-134500-1

Client Sample ID: FC-CCR-FD01-120319

Lab Sample ID: 550-134500-4

Date Collected: 12/03/19 10:40

Matrix: Water

Date Received: 12/09/19 10:21

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	197653	12/10/19 01:21	NEL	TAL PHX
Total/NA	Prep	200.7			197605	12/10/19 07:18	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198601	12/20/19 03:59	SRA	TAL PHX
Total/NA	Prep	200.7			197605	12/10/19 07:18	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198847	12/23/19 22:43	SRA	TAL PHX
Total/NA	Analysis	SM 2540C		1	197607		YET	TAL PHX
						(Start) 12/10/19 08:10		
						(End) 12/11/19 09:50		
Total/NA	Analysis	SM 4500 H+ B		1	197831	12/12/19 14:14	MRR	TAL PHX

Client Sample ID: FC-CCR-MW65-120319

Lab Sample ID: 550-134500-5

Date Collected: 12/03/19 12:43

Matrix: Water

Date Received: 12/09/19 10:21

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	197653	12/10/19 01:48	NEL	TAL PHX
Total/NA	Prep	200.7			197605	12/10/19 07:18	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198601	12/20/19 04:02	SRA	TAL PHX
Total/NA	Prep	200.7			197605	12/10/19 07:18	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	198847	12/23/19 22:46	SRA	TAL PHX
Total/NA	Analysis	SM 2540C		1	197607		YET	TAL PHX
						(Start) 12/10/19 08:10		
						(End) 12/11/19 09:50		
Total/NA	Analysis	SM 4500 H+ B		1	197831	12/12/19 14:14	MRR	TAL PHX

Laboratory References:

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

Accreditation/Certification Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-134500-1

Laboratory: Eurofins TestAmerica, Phoenix

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

Authority	Program	Identification Number	Expiration Date
Arizona	State Program	AZ0728	06-09-20

Method Summary

Client: Arizona Public Service Company
Project/Site: CCR

Job ID: 550-134500-1

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL PHX
200.7 Rev 4.4	Metals (ICP)	40CFR136A	TAL PHX
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PHX
SM 4500 H+ B	pH	SM	TAL PHX
200.7	Preparation, Total Metals	EPA	TAL PHX

Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.
EPA = US Environmental Protection Agency
MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
SM = "Standard Methods For The Examination Of Water And Wastewater"

Laboratory References:

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

TestAmerica Phoenix
4645 E Cotton Ctr Blvd Bdg 3
Phoenix, AZ 85040
phone 602.437.3340 fax 623.445.6192

134500

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Jim Edwards	Site Contact: Jim Edwards	Date:	COC No:
APS Four Corners	Tel/Fax: 928-386-0302	Lab Contact: Ken Baker	Carrier:	1 of 1 COCs
PO Box 355, MS 4915	Analysis Turnaround Time			Job No.
Fruitland, NM 87416	Calendar (C) or Work Days (W)			
Phone:	TAT if different from Below 7 Days			SDG No.
Fax:	☐ 2 weeks			
Project Name: CCR	☑ 1 week			
E-Mail Address:	☐ 2 days			
	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	Perform MS / MSD (Y / N)	EPA 200.7 (B, Ca, Li)	EPA 300.0 (F)	SM 2540C (TDS)	SM 4500-HB (pH)	Sample Specific Notes:
FC-CCR-MW62- 120319	12/03/19	13:22	G	W	2	N	X	X	X	X	X	Low flow -01
FC-CCR-MW63- 120319	12/03/19	10:40	G	W	2	N		X	X	X	X	-02
FC-CCR-MW64- 120319	12/03/19	11:17	G	W	2	N		X	X	X	X	-03
FC-CCR-FD01-120319	12/03/19	10:40	G	W	2	N		X	X	X	X	-04
FC-CCR-MW65- 120319	12/03/19	12:43	G	W	2	N		X	X	X	X	-05

550-134500 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Wood	12/06/19 19:30		Wood	12/6/19 1930
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Wood	1021 12/8/19			
Relinquished by:	Company:	Date/Time:	Received by: TA-PHX	Company:	Date/Time: 10:24 12-09-19
	CDM			TA-PHX	

TAT 2-C-c

12/27/2019

Login Sample Receipt Checklist

Client: Arizona Public Service Company

Job Number: 550-134500-1

Login Number: 134500
List Number: 1
Creator: Gravlin, Andrea

List Source: Eurofins TestAmerica, Phoenix

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

APPENDIX D

2019 DATA VALIDATION REPORT

2019 DATA VALIDATION REPORT

CCR Rule Compliance Groundwater Monitoring Data
Four Corners Power Plant, Arizona Public Service
Farmington, New Mexico

Prepared by:

Wood Environment & Infrastructure Solutions, Inc.
4600 East Washington Street, Suite 600
Phoenix, Arizona 85034-1917
(602) 733-6000

January 31, 2020

Project No. 1420192017.****.03

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Table 2 Field Duplicate Detections

Table 3 Qualifiers Added During Data Validation

APPENDICES

Appendix A Data Assessment Checklists by Sample Delivery Group

ACRONYMS

%	percent
APS	Arizona Public Service Company
BTV(s)	background threshold value(s)
CCR	coal combustion residuals
CLP	Contract Laboratory Program
COC	chain of custody
EPA	United States Environmental Protection Agency
GWPS(s)	Groundwater Protection Standard(s)
ID	identification
LCS	laboratory control sample
LCSD	laboratory control sample
MCL	maximum contaminant level
mg/L	milligrams per liter
MS	matrix spike
MSD	matrix spike duplicate
QC	quality control
RL	reporting limit
RPD	relative percent difference
SAP	sampling and analysis plan
SDG	sample delivery group
SM	Standard Method
TDS	total dissolved solids
Wood	Wood Environment & Infrastructure Solutions, Inc.

DATA VALIDATION REPORT
Arizona Public Service Four Corners
Farmington, New Mexico

1.0 INTRODUCTION

Arizona Public Service (APS) collected groundwater Detection and Assessment Monitoring samples to support Coal Combustion Residuals (CCR) Rule Compliance during the 2019 calendar year (the reporting period) at the APS Four Corners Power Plant, located near Farmington, New Mexico. This report presents the standard methods used to validate reporting period data and documents the results of the data validation process in summary tables and checklists generated as the samples were collected throughout the year.

2.0 DATA VALIDATION METHODOLOGY

Wood Environment & Infrastructure Solutions, Inc. (Wood) performed a United States Environmental Protection Agency (EPA) Stage 2A validation on samples collected by APS during the 2019 calendar year. This is equivalent to a Level I data evaluation as defined in the project sampling and analysis plan (SAP). The Stage 2A validation includes review of the quality control (QC) results in laboratory analytical reports and does not include review or validation of the raw analytical data. Data validation activities have been performed in general accordance with:

- APS, 2018. Sampling and Analysis Plan, Coal Combustion Residual (CCR) Groundwater Monitoring, Four Corners Power Plant, Arizona Public Service, Farmington, New Mexico, (originally prepared by AECOM, Inc. in December 2015 and updated by APS in January 2018).
- EPA, 2004. SW 846 Test Methods for Evaluating Solid Wastes, Update IIIB.
- EPA, 2017. EPA Contract Laboratory Program (CLP) National Functional Guidelines for Inorganic Superfund Data Review, EPA 540-R-2017-001.

The CLP guidelines were written specifically for the CLP, and have been modified for the purposes of data reviews conducted during the reporting period where they differ from method-specific QC requirements.

During each groundwater monitoring round conducted during the reporting period, the laboratory's certified analytical report and supporting documentation were reviewed to assess the following:

- Data package and electronic data deliverable completeness;

- Chain of custody (COC) compliance;
- Holding time compliance;
- Presence or absence of laboratory contamination as demonstrated by laboratory blanks;
- Accuracy and bias as demonstrated by recovery of laboratory control sample (LCS) and matrix spike (MS) samples;
- Analytical precision as relative percent difference (RPD) of analyte concentration between laboratory duplicates, LCS/LCS duplicates (LCSDs), or MSs/MS duplicates (MSDs);
- Insofar as possible, the degree of conformance to method requirements and good laboratory practices.

Appendix A presents data assessment checklists generated for each sample delivery group submitted to the analytical laboratory during the reporting period. The laboratory performing the analyses as well as the methods of analysis are presented in the individual checklists. Table 1 presents a comprehensive listing of reporting period samples and Table 2 summarizes field duplicate detections at concentrations greater than analytical reporting limits.

In general, it is important to recognize that no analytical data are guaranteed to be correct, even if all QC audits are passed. Strict QC serves to increase confidence in data, but any reported value may potentially contain error.

3.0 EXPLANATION OF DATA QUALITY INDICATORS

Summary explanations of the specific data quality indicators reviewed during data validation are presented below.

3.1 LABORATORY CONTROL SAMPLE RECOVERIES

LCSs are aliquots of analyte free matrices that are spiked with the analytes of interest for an analytical method, or a representative subset of those analytes. The spiked matrix is then processed through the same analytical procedures as the samples it accompanies. LCS recovery is an indication of a laboratory's ability to successfully perform an analytical method in an interference free matrix.

3.2 MATRIX SPIKE RECOVERIES

MSs and MSDs are prepared by adding known amounts of the analytes of interest for an analytical method, or a representative subset of those analytes, to an aliquot of sample. The spiked sample is

then processed through the same extraction, concentration, cleanup, and analytical procedures as the unspiked samples in an analytical batch.

MS recovery and precision are an indication of a laboratory's ability to successfully recover an analyte in the matrix of a specific sample or closely related sample matrices. It is important not to apply MS results for any specific sample to other samples without understanding how the sample matrices are related.

3.3 BLANK CONCENTRATIONS

Blank samples are aliquots of analyte free matrix that are used as negative controls to verify that the sample collection, storage, preparation, and analysis system does not produce false positive results.

Laboratory blanks are processed by the laboratory using exactly the same procedures as the field samples. Target analytes should not be found in laboratory blanks.

When target analytes are detected in blanks, analyte concentrations in associated samples less than five times the concentration detected in the blank will be U qualified as being not detected.

3.4 LABORATORY DUPLICATES

Laboratory duplicate analysis verifies acceptable method precision by the laboratory at the time of preparation and analysis and/or sampling precision at the time of collection.

4.0 DEFINITIONS OF DATA VALIDATION QUALIFIERS

The following qualifiers may be added to the data during data validation:

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

R The sample result is rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

5.0 CHAIN OF CUSTODY AND SAMPLE RECEIPT CONDITION DOCUMENTATION

Unless otherwise noted in the Data Assessment Checklists included in Appendix A, the samples were received at the laboratories under proper COC, intact, properly preserved, and at temperatures less than the SAP-specified maximum of 6 degrees Celsius.

6.0 SPECIFIC DATA VALIDATION FINDINGS

Results for groundwater monitoring samples collected in 2019 may be considered usable with the limitations and exceptions summarized in Table 3. The following sections identify requirements used in data assessment.

6.1 METALS BY EPA METHODS 200.7, 200.8, AND 245.1

6.1.1 Holding Times

Samples must be analyzed for metals within the SAP-specified holding time of 28 days for mercury and 180 days for additional metals.

6.1.2 Laboratory Blanks

Target analytes must not be detected in the laboratory blanks associated with the analysis of site samples.

6.1.3 Laboratory Control Sample Accuracy and Precision

LCS and LCSD recoveries must be within the laboratory-specified 85 to 115 percent (%) limits and RPDs between the LCS and LCSD results must be less than the laboratory-specified maximum of 20%.

6.1.4 Matrix Spikes/Matrix Spike Duplicates

Laboratories performed MS and MSD analysis on the project samples specified in the Data Assessment Checklists included in Appendix A. MS/MSD recoveries must be within laboratory-specified limits of 70 to 130% and RPDs between MS and MSD results must be less than the laboratory-specified maximum of 20%.

6.1.5 Analytical Sensitivity

RLs for antimony, arsenic, barium, beryllium, cadmium, chromium, mercury, selenium, and thallium must be sufficiently low to meet the National Primary Drinking Water Regulation Maximum Contamination Limits (MCLs). RLs or cobalt, lead, lithium, and molybdenum must be sufficiently low to meet alternative Groundwater Protection Standards (GWPSs).

Boron and calcium are not EPA-regulated analytes in groundwater and it is not possible to evaluate the RLs for these analytes against the National Primary Drinking Water Regulation MCLs.

6.2 ANIONS BY EPA METHOD 300.0

6.2.1 Holding Times

Samples must be analyzed for anions within the SAP-specified holding time of 28 days.

6.2.2 Laboratory Blanks

Fluoride, chloride, and sulfate must not be detected in the laboratory blanks associated with the analysis of these samples.

6.2.3 Laboratory Control Samples

LCS and LCSD recoveries must be within the laboratory-specified limits of 90 to 110% and RPDs between the LCS and LCSD results must be less than the laboratory-specified maximum values.

6.2.4 Matrix Spikes/Matrix Spike Duplicates

Laboratories performed MS and MSD analysis on the project samples specified in the Data Assessment Checklists included in Appendix A. Recoveries must be within the laboratory-specified limits of 80 to 120%, and RPDs between MS and MSD results must be less than the laboratory-specified limit of 20%.

6.2.5 Laboratory Duplicates

Laboratories performed duplicate analysis on the project samples specified in the Data Assessment Checklists included in Appendix A. The RPDs between duplicate results must be less than the laboratory-specified 20% limit.

6.2.6 Analytical Sensitivity

Fluoride RLs must be sufficiently low to meet the 4 mg/L MCL. Chloride and sulfate are not EPA-regulated analytes in groundwater and it is not possible to evaluate the RLs for these analytes against the Primary Drinking Water Regulation MCLs.

There are applicable CCR Groundwater Monitoring Program Background Threshold Values (BTVs) for fluoride, chloride, and sulfate for the site. Analytical sensitivity must also be evaluated for these site-specific comparison criteria.

6.3 TOTAL DISSOLVED SOLIDS BY SM 2540C

6.3.1 Holding Times

All samples must be analyzed for TDS within the SAP-specified holding time of 7 days.

6.3.2 Laboratory Blanks

TDS must not be detected in the laboratory blanks at concentrations above the reporting limit.

6.3.3 Laboratory Control Sample Accuracy and Precision

LCS and LCSD recoveries must be within the laboratory-specified limits of 90 to 110% and RPDs between the LCS and LCSD results must be less than the laboratory-specified maximum of 10%.

6.3.4 Laboratory Duplicates

Laboratories performed duplicate analysis for TDS on the project samples specified in the Data Assessment Checklists included in Appendix A. RPDs between primary sample and laboratory duplicate results must be less than the laboratory-specified 10% limit.

6.4 PH BY SM 4500B

6.4.1 Holding Times

All samples must be analyzed for pH within 15 minutes of sample collection.

6.4.2 Laboratory Control Sample Accuracy

LCS recoveries must be within the laboratory-specified limits of 98.5 to 101.5%.

6.4.3 Laboratory Duplicates

Laboratories performed duplicate analysis for pH on the project samples specified in the Data Assessment Checklists included in Appendix A. RPDs between primary sample and laboratory duplicate results must be less than the laboratory-specified 5% limit.

6.5 RADIUM BY EPA METHODS 903.0 AND 904.0

6.5.1 Holding Time

All samples must be analyzed for radium within the EPA-recommended holding time of 6 months.

6.5.2 Laboratory Blanks

Radium must not be detected in the laboratory blanks at concentrations above the reporting limit.

6.5.3 Laboratory Control Sample Accuracy

LCS and LCSD recoveries must be within laboratory-specified limits.

6.5.4 Carrier Accuracy

Carrier recoveries must be within the laboratory-specified 40 to 110% limits.

6.5.5 Analytical Sensitivity

Total radium RLs must be sufficiently low to meet the MCL of 5 picocuries per liter. Pending development of applicable CCR Groundwater Monitoring Program BTVs and/or GPSs for the site, analytical sensitivity must also be evaluated for these site-specific comparison criteria.

7.0 FIELD DUPLICATES

APS collected field duplicate samples of the specified field original samples as specified in Table 1. Target analyte detections are summarized in Table 2. Precision values must be less than the SAP-specified maximum of 20%, or the differences between the detected concentrations must be less than the RLs.

8.0 SUMMARY AND CONCLUSIONS

Data are usable with the addition of qualifiers as presented in Table 3.

REFERENCES

APS, 2018. Sampling and Analysis Plan CCR Groundwater Monitoring Four Corners Power Plant Arizona Public Service, Farmington, New Mexico. Originally prepared by AECOM in December 2015 and updated by APS in January 2018.

EPA, 2017. EPA Contract Laboratory Program (CLP) National Functional Guidelines for Inorganic Superfund Data Review, EPA 540-R-2017-001.

EPA, 2004. SW 846 Test Methods for Evaluating Solid Wastes, Update IIIB.

LIMITATIONS

This report was prepared exclusively for Arizona Public Service by Wood Environment & Infrastructure Solutions, Inc. The quality of information, conclusions, and estimates contained herein is consistent with the level of effort involved in Wood services and based on: i) information available at the time of preparation, ii) data supplied by outside sources, and iii) the assumptions, conditions, and qualifications set forth in this report. This data validation report is intended to be used by Arizona Public Service for the Four Corners Power Plant site only, subject to the terms and conditions of its contract with Wood. Any other use of, or reliance on, this report by any third party is at that party's sole risk.

TABLES

TABLE 1
FIELD SAMPLES SUBMITTED TO ANALYTICAL LABORATORIES
Coal Combustion Residuals Rule
2019 Compliance Monitoring Groundwater Data

Sampling Program	CCR Unit	Collection Date and Time	Field Sample Identification	Eurofins TestAmerica Sample Identification	RSE Sample Identification	Notes
Assessment	Multiunit 1	3/19/2019 9:25	FC-CCR-MW49A-031919	550-119824-1	61892	---
Assessment	Multiunit 1	3/19/2019 16:43	FC-CCR-MW61-031919	550-119824-2	61893	---
Assessment	Multiunit 1	3/18/2019 18:50	FC-CCR-MW74-031819	550-119824-3	61894	Logged in by Eurofins as FC-CCR-MW74-031919
Assessment	Multiunit 1	3/19/2019 17:43	FC-CCR-MW75-031919	550-119824-4	61895	---
Assessment	Multiunit 1	3/20/2019 12:58	FC-CCR-MW7-032019	550-119824-5	61896	Logged in by Eurofins as FC-CCR-MW7-031919
Assessment	Multiunit 1	3/20/2019 13:59	FC-CCR-MW8-032019	550-119824-6	61897	Logged in by Eurofins as FC-CCR-MW8-031919
Assessment	Multiunit 1	3/20/2019 16:22	FC-CCR-MW87-032019	550-119824-7	61898	Logged in by Eurofins as FC-CCR-MW87-031919
Assessment	Multiunit 1	3/19/2019 12:20	FC-CCR-MW6-031919	550-119824-8	61899	---
Assessment	Multiunit 1	3/19/2019 15:40	FC-CCR-MW38R-031919	550-119824-9	61900	---
Assessment	Multiunit 1	3/19/2019 14:33	FC-CCR-MW57-031919	550-119824-10	61901	---
Assessment	Multiunit 1	3/19/2019 13:35	FC-CCR-MW17R-031919	550-119824-11	61886	---
Assessment	Multiunit 1	3/20/2019 11:07	FC-CCR-MW15-032019	550-119829-1	61887	---
Assessment	Multiunit 1	3/19/2019 18:40	FC-CCR-DMX6-031919	550-119829-2	61888	---
Assessment	Multiunit 1	3/20/2019 12:04	FC-CCR-MW16-032019	550-119829-3	61889	---
Assessment	Multiunit 1	3/20/2019 15:17	FC-CCR-MW56-032019	550-119829-4	61890	---
Assessment	Multiunit 1	3/19/2019 10:56	FC-CCR-DMX4-031919	550-119829-5	61891	---
Assessment	URS	3/17/2019 16:21	FC-CCR-MW84-031719	550-119831-1	61902	---
Assessment	URS	3/20/2019 17:53	FC-CCR-MW85-032019	550-119831-2	61903	---
Assessment	URS	3/18/2019 13:04	FC-CCR-MW86-031819	550-119831-3	61904	---
Assessment	URS	3/18/2019 14:14	FC-CCR-MW66-031819	550-119833-1	61905	---
Assessment	URS	3/17/2019 15:05	FC-CCR-MW67-031719	550-119833-2	61906	---
Assessment	URS	3/17/2019 12:52	FC-CCR-MW68-031719	550-119833-3	61907	---
Assessment	URS	3/17/2019 13:59	FC-CCR-MW69-031719	550-119833-4	61908	---
Assessment	URS	3/18/2019 16:04	FC-CCR-MW70-031819	550-119833-5	61909	---

TABLE 1
FIELD SAMPLES SUBMITTED TO ANALYTICAL LABORATORIES
Coal Combustion Residuals Rule
2019 Compliance Monitoring Groundwater Data

Sampling Program	CCR Unit	Collection Date and Time	Field Sample Identification	Eurofins TestAmerica Sample Identification	RSE Sample Identification	Notes
Assessment	URS/CWTP	3/18/2019 11:09	FC-CCR-MW71-031819	550-119833-6	61910	---
Assessment	URS/CWTP	3/17/2019 10:50	FC-CCR-MW72-031719	550-119833-7	61911	---
Assessment	URS/CWTP	3/18/2019 17:40	FC-CCR-MW73-031819	550-119833-8	61912	---
Assessment	URS/CWTP	3/18/2019 9:43	FC-CCR-MW83-031819	550-119833-9	61913	---
Assessment	URS	3/20/2019 17:53	FC-CCR-FD01-032019	550-119833-10	61914	Field duplicate of FC-CCR-MW85-032019
Detection	CWTP	5/7/2019 11:30	FC-CCR-MW62-5719	550-122532-1	--	---
Detection	CWTP	5/7/2019 11:59	FC-CCR-MW63-5719	550-122532-2	--	---
Detection	CWTP	5/7/2019 12:30	FC-CCR-MW64-5719	550-122532-3	--	---
Detection	CWTP	5/7/2019 12:30	FC-CCR-FD03-5719	550-122532-4	--	Field duplicate of FC-CCR-MW64-5719
Detection	CWTP	5/7/2019 9:14	FC-CCR-MW65-5719	550-122532-5	--	---
Assessment	URS	5/7/2019 10:39	FC-CCR-MW66-5719	550-122531-1	62278	---
Assessment	URS	5/7/2019 16:37	FC-CCR-MW67-5719	550-122531-2	62279	---
Assessment	URS	5/7/2019 14:46	FC-CCR-MW68-5719	550-122531-3	62280	---
Assessment	URS	5/7/2019 15:39	FC-CCR-MW69-5719	550-122531-4	62281	---
Assessment	URS	5/7/2019 13:09	FC-CCR-MW70-5719	550-122531-5	62282	---
Assessment	URS/CWTP	5/6/2019 20:11	FC-CCR-MW71-5619	550-122531-6	62283	Logged in by Eurofins as FC-CCR-MW71-5719, MS/MSD
Assessment	URS/CWTP	5/7/2019 14:03	FC-CCR-MW72-5719	550-122531-7	62284	---
Assessment	URS/CWTP	5/6/2019 19:18	FC-CCR-MW73-5619	550-122531-8	62285	---
Assessment	URS	5/6/2019 18:19	FC-CCR-MW83-5619	550-122531-9	62286	---
Assessment	URS	5/6/2019 18:19	FC-CCR-FD01-5619	550-122531-10	62287	Field duplicate of FC-CCR-MW83-5619
Assessment	URS	5/7/2019 16:11	FC-CCR-MW84-5719	550-122531-11	62288	---
Assessment	URS	5/7/2019 17:19	FC-CCR-MW85-5719	550-122531-12	62289	---
Assessment	URS	5/7/2019 9:54	FC-CCR-MW86-5719	550-122531-13	62290	---
Assessment	URS	5/7/2019 9:54	FC-CCR-FD02-5719	550-122531-14	62291	Field duplicate of FC-CCR-MW86-5719
Assessment	Multiunit 1	5/14/2019 19:12	FC-CCR-MW49A-51419	550-122988-1	62250	---
Assessment	Multiunit 1	5/13/2019 19:49	FC-CCR-MW61-51319	550-122988-2	62251	---

TABLE 1
FIELD SAMPLES SUBMITTED TO ANALYTICAL LABORATORIES
Coal Combustion Residuals Rule
2019 Compliance Monitoring Groundwater Data

Sampling Program	CCR Unit	Collection Date and Time	Field Sample Identification	Eurofins TestAmerica Sample Identification	RSE Sample Identification	Notes
Assessment	Multiunit 1	5/13/2019 18:59	FC-CCR-MW74-51319	550-122988-3	62252	---
Assessment	Multiunit 1	5/13/2019 20:19	FC-CCR-MW75-51319	550-122988-4	62253	---
Assessment	Multiunit 1	5/14/2019 8:49	FC-CCR-MW7-51419	550-122988-5	62254	---
Assessment	Multiunit 1	5/14/2019 7:52	FC-CCR-MW8-51419	550-122988-6	62255	---
Assessment	Multiunit 1	5/14/2019 12:18	FC-CCR-MW87-51419	550-122988-7	62256	---
Assessment	Multiunit 1	5/14/2019 14:38	FC-CCR-MW6-51419	550-122988-8	62257	---
Assessment	Multiunit 1	5/14/2019 16:17	FC-CCR-MW38R-51419	550-122988-9	62258	---
Assessment	Multiunit 1	5/14/2019 14:25	FC-CCR-MW57-51419	550-122988-10	62259	---
Assessment	Multiunit 1	5/14/2019 18:01	FC-CCR-MW17R-51419	550-122988-11	62261	---
Assessment	Multiunit 1	5/14/2019 18:01	FC-CCR-FD01-51419	550-122988-12	62260	Field duplicate of MW17R-51419
Assessment	Multiunit 1	5/14/2019 10:46	FC-CCR-MW15-51419	550-122988-13	62262	---
Assessment	Multiunit 1	5/14/2019 11:28	FC-CCR-DMX6-51419	550-122988-14	62263	---
Assessment	Multiunit 1	5/14/2019 9:27	FC-CCR-MW16-51419	550-122988-15	62264	---
Assessment	Multiunit 1	5/14/2019 9:27	FC-CCR-FD02-51419	550-122988-16	62266	Field duplicate of MW16-51419
Assessment	Multiunit 1	5/14/2019 17:04	FC-CCR-MW56-51419	550-122988-17	62265	---
Assessment	Multiunit 1	5/14/2019 13:17	FC-CCR-DMX4-51419	550-122988-18	62267	---
Assessment	Multiunit 1	11/19/2019 8:07	FC-CCR-MW49A-111919	550-133678-1	63373	---
Assessment	Multiunit 1	11/19/2019 9:38	FC-CCR-MW61-111919	550-133678-2	63374	---
Assessment	Multiunit 1	11/19/2019 10:15	FC-CCR-MW75-111919	550-133678-3	63375	---
Assessment	Multiunit 1	11/19/2019 11:56	FC-CCR-MW7-111919	550-133678-4	63376	---
Assessment	Multiunit 1	11/19/2019 12:29	FC-CCR-MW8-111919	550-133678-5	63377	---
Assessment	Multiunit 1	11/19/2019 17:25	FC-CCR-MW87-111919	550-133678-6	63378	---
Assessment	Multiunit 1	11/19/2019 15:43	FC-CCR-MW6-111919	550-133678-7	63379	---
Assessment	Multiunit 1	11/19/2019 13:09	FC-CCR-MW38R-111919	550-133678-8	63380	---
Assessment	Multiunit 1	11/19/2019 13:50	FC-CCR-MW57-111919	550-133678-9	63381	---
Assessment	Multiunit 1	11/19/2019 13:09	FC-CCR-FD01-111919	550-133678-10	63382	Field duplicate of FC-CCR-MW38R-111919
Assessment	Multiunit 1	11/19/2019 14:02	FC-CCR-MW17R-111919	550-133678-11	63383	---
Assessment	Multiunit 1	11/19/2019 16:46	FC-CCR-MW15-111919	550-133678-12	63384	---

TABLE 1
FIELD SAMPLES SUBMITTED TO ANALYTICAL LABORATORIES
Coal Combustion Residuals Rule
2019 Compliance Monitoring Groundwater Data

Sampling Program	CCR Unit	Collection Date and Time	Field Sample Identification	Eurofins TestAmerica Sample Identification	RSE Sample Identification	Notes
Assessment	Multiunit 1	11/19/2019 18:11	FC-CCR-DMX6-111919	550-133678-13	63385	---
Assessment	Multiunit 1	11/19/2019 19:31	FC-CCR-MW16-111919	550-133678-14	63386	---
Assessment	Multiunit 1	11/19/2019 15:01	FC-CCR-MW56-111919	550-133678-15	63387	---
Assessment	Multiunit 1	11/19/2019 17:25	FC-CCR-FD02-111919	550-133678-16	63388	Field duplicate of FC-CCR-MW87-111919
Assessment	Multiunit 1	11/19/2019 16:34	FC-CCR-DMX4-111919	550-133678-17	63389	---
Assessment	URS	12/3/2019 14:45	FC-CCR-MW66-120319	550-134494-1		
Assessment	URS	12/2/2019 18:59	FC-CCR-MW67-120219	550-134494-2		Logged in with a sample date of 12/03/19
Assessment	URS	12/2/2019 17:31	FC-CCR-MW68-120219	550-134494-3		Logged in with a sample date of 12/03/19
Assessment	URS	12/2/2019 16:50	FC-CCR-MW69-120219	550-134494-4		Logged in with a sample date of 12/03/19
Assessment	URS	12/3/2019 15:45	FC-CCR-MW70-120319	550-134494-5		
Assessment	URS/CWTP	12/2/2019 15:06	FC-CCR-MW71-120219	550-134494-6		
Assessment	URS/CWTP	12/2/2019 16:02	FC-CCR-MW72-120219	550-134494-7		
Assessment	URS/CWTP	12/2/2019 14:08	FC-CCR-MW73-120219	550-134494-8		
Assessment	URS/CWTP	12/3/2019 9:52	FC-CCR-MW83-120319	550-134494-9		Logged in with a sample date of 12/02/19
Assessment	URS/CWTP	12/2/2019 14:08	FC-CCR-FD01-120219	550-134494-10		Field duplicate of FC-CCR-MW73-120219
Assessment	URS	12/3/2019 7:57	FC-CCR-MW84-120319	550-134494-11		
Assessment	URS	12/3/2019 8:47	FC-CCR-MW85-120319	550-134494-12		
Assessment	URS	12/3/2019 13:56	FC-CCR-MW86-120319	550-134494-13		
Assessment	URS	12/3/2019 14:45	FC-CCR-FD02-120319	550-134494-14		Field duplicate of FC-CCR-MW66-120319
Detection	CWTP	12/3/2019 13:22	FC-CCR-MW62-120319	550-134500-1		
Detection	CWTP	12/3/2019 10:40	FC-CCR-MW63-120319	550-134500-2		
Detection	CWTP	12/3/2019 11:17	FC-CCR-MW64-120319	550-134500-3		

TABLE 1
FIELD SAMPLES SUBMITTED TO ANALYTICAL LABORATORIES
Coal Combustion Residuals Rule
2019 Compliance Monitoring Groundwater Data

Sampling Program	CCR Unit	Collection Date and Time	Field Sample Identification	Eurofins TestAmerica Sample Identification	RSE Sample Identification	Notes
Detection	CWTP	12/3/2019 10:40	FC-CCR-FD01-120319	550-134500-4		Field duplicate of FC-CCR-MW63-120319
Detection	CWTP	12/3/2019 12:43	FC-CCR-MW65-120319	550-134500-5		

TABLE 2
FIELD DUPLICATE DETECTIONS
Coal Combustion Residuals Rule
2019 Compliance Monitoring Groundwater Data

Analyte	Reporting Limit	Primary Result	Duplicate Result	RPD	Notes
FC-CCR-MW85-032019 and FC-CCR-FD01-032019					
Lithium	0.20 mg/L	0.25	0.25	0.0%	
Arsenic	0.00050 mg/L	0.0043	0.0041	4.8%	
Barium	0.00050 mg/L	0.016	0.017	6.1%	
Chromium	0.0010 mg/L	0.0028	0.0010 U	NC	J/UJ-FD
Molybdenum	0.00050 mg/L	0.0052	0.0045	14%	
Selenium	0.00050 mg/L	0.16	0.16	0.0%	
Thallium	0.00010 mg/L	0.00023	0.00023	0.0%	
Ra-228	0.8 pCi/L	0.8 ± 0.3	< 0.7	NC	
Total Radium	0.8 pCi/L	0.8 ± 0.3	< 0.7	NC	
FC-CCR-MW83-5619 and FC-CCR-FD01-5619					
Fluoride	0.80 mg/L	1.0	1.1	9.5%	
Boron	0.050 mg/L	1.8	1.8	0.0%	
Calcium	2.0 mg/L	240	240	0.0%	
Lithium	0.20 mg/L	0.20 U	0.20	NC	± RL
Arsenic	0.00050 mg/L	0.0017	0.0017	0.0%	
Barium	0.00050 mg/L	0.032	0.032	0.0%	
Molybdenum	0.00050 mg/L	0.037	0.035	5.6%	
Selenium	0.00050 mg/L	0.0014	0.0013	7.4%	
Total Dissolved Solids	20 mg/L	2,300	2,500	8.3%	
pH	1.7 S.U.	7.5	7.5	0.0%	
FC-CCR-MW86-5719 and FC-CCR-FD02-5719					
Fluoride	0.80 mg/L	0.80	0.80 U	NC	± RL
Boron	0.050 mg/L	54	54	0.0%	
Calcium	2.0 mg/L	380	380	0.0%	
Lithium	0.20 mg/L	0.29	0.29	0.0%	
Arsenic	0.00050 mg/L	0.00096	0.0013	30%	± RL
Barium	0.0010 mg/L	0.014	0.013	7.4%	
Cobalt	0.00050 mg/L	0.0018	0.0018	0.0%	
Molybdenum	0.00050 mg/L	0.0036	0.0036	0.0%	
Selenium	0.00050 mg/L	0.0091	0.010	9.4%	
Thallium	0.00010 mg/L	0.00025	0.00025	0.0%	
Total Dissolved Solids	100 mg/L	8,900	9,000	1.1%	
pH	1.7 S.U.	7.4	7.4	0.0%	
Radium 228	0.8 pCi/L	1.1 ± 0.3	1.1 ± 0.3	0.0%	
Total Radium	0.8 pCi/L	1.1 ± 0.3	1.1 ± 0.3	0.0%	
FC-CCR-MW64-5719 and FC-CCR-FD03-5719					
Fluoride	0.40 mg/L	1.4	1.4	0.0%	
Boron	0.050 mg/L	0.49	0.48	2.1%	
Calcium	2.0 mg/L	89	88	1.1%	
Total Dissolved Solids	20 mg/L	790	780	1.3%	
pH	1.7 S.U.	8.0	8.0	0.0%	

TABLE 2
FIELD DUPLICATE DETECTIONS
Coal Combustion Residuals Rule
2019 Compliance Monitoring Groundwater Data

Analyte	Reporting Limit	Primary Result	Duplicate Result	RPD	Notes
FC-CCR-MW17R-51419 and FC-CCR-FD01-51419					
Chloride	200 mg/L	390	380	2.6%	
Sulfate	200 mg/L	4,000	3,900	2.5%	
Boron	0.050 mg/L	33	33	0.0%	
Calcium	2.0 mg/L	440	430	2.3%	
Lithium	0.20 mg/L	0.42	0.41	2.4%	
Barium	0.00050 mg/L	0.017	0.018	5.7%	
Cadmium	0.00010 mg/L	0.0013	0.0014	7.4%	
Cobalt	0.00050 mg/L	0.064	0.064	0.0%	
Lead	0.00050 mg/L	0.0022	0.0022	0.0%	
Molybdenum	0.00050 mg/L	0.0014	0.0013	7.4%	
Thallium	0.00010 mg/L	0.00022	0.00022	0.0%	
Total Dissolved Solids	100 mg/L	6,200	6,300	1.6%	
pH	1.7 S.U.	7.5	7.5	0.0%	
Radium 228	0.8 pCi/L	1.7 ± 0.4	1.2 ± 0.3	34%	± RL
Total Radium	0.8 pCi/L	1.7 ± 0.4	1.2 ± 0.3	34%	± RL
FC-CCR-MW16-51419 and FC-CCR-FD02-51419					
Chloride	300 mg/L	1,300	1,000	26%	± RL
Sulfate	300 mg/L	11,000	10,000	10%	
Boron	0.050 mg/L	6.6	6.6	0.0%	
Calcium	2.0 mg/L	410	410	0.0%	
Lithium	0.20 mg/L	1.3	1.3	0.0%	
Arsenic	0.00050 mg/L	0.0017	0.0012	34%	± RL
Barium	0.00050 mg/L	0.021	0.021	0.0%	
Cadmium	0.00010 mg/L	0.00013	0.00015	14%	
Cobalt	0.00050 mg/L	0.0054	0.0052	3.8%	
Molybdenum	0.00050 mg/L	0.0018	0.0018	0.0%	
Selenium	0.00050 mg/L	0.050	0.048	4.1%	
Thallium	0.00010 mg/L	0.00040	0.00041	2.5%	

TABLE 2
FIELD DUPLICATE DETECTIONS
Coal Combustion Residuals Rule
2019 Compliance Monitoring Groundwater Data

Analyte	Reporting Limit	Primary Result	Duplicate Result	RPD	Notes
Total Dissolved Solids	200 mg/L	17,000	17,000	0.0%	
pH	1.7 S.U.	7.2	7.2	0.0%	
Radium 228	0.8 pCi/L	1.9 ± 0.4	1.7 ± 0.4	11%	
Total Radium	0.8 pCi/L	1.9 ± 0.4	1.7 ± 0.4	11%	
FC-CCR-MW38R-111919 and FC-CCR-FD01-111919					
Chloride	150 mg/L	270	270	0%	
Sulfate	300 mg/L	4,000	4,000	0%	
Boron	0.050 mg/L	26	27	3.8%	
Calcium	2.0 mg/L	450	450	0%	
Lithium	0.20 mg/L	0.37	0.37	0%	
Arsenic	0.00050 mg/L	0.00050 U	0.00064	NC	± RL
Barium	0.00050 mg/L	0.020	0.019	5.1%	
Cadmium	0.00010 mg/L	0.00013	0.00015	14%	
Chromium	0.0010 mg/L	0.0011	0.0011	0%	
Cobalt	0.00050 mg/L	0.23	0.23	0%	
Molybdenum	0.00050 mg/L	0.0050	0.0049	2.0%	
Selenium	0.00050 mg/L	0.0010	0.00080	22%	± RL
Total Dissolved Solids	100 mg/L	6,100	5,900	3.3%	
pH	1.7 S.U.	7.5	7.5	0%	
FC-CCR-MW87-111919 and FC-CCR-FD02-111919					
Chloride	400 mg/L	1,600	1,700	6.1%	
Sulfate	400 mg/L	18,000	18,000	0%	
Boron	0.050 mg/L	2.4	2.4	0%	
Calcium	2.0 mg/L	420	440	4.7%	
Lithium	0.20 mg/L	1.2	1.3	8%	
Arsenic	0.0010 mg/L	0.0028	0.0014	67%	J-FD
Barium	0.00050 mg/L	0.015	0.015	0%	
Cadmium	0.00010 mg/L	0.00024	0.00024	0%	
Cobalt	0.00050 mg/L	0.0037	0.0036	2.7%	
Molybdenum	0.00050 mg/L	0.030	0.028	6.9%	
Selenium	0.00050 mg/L	0.015	0.018	18%	
Thallium	0.00010 mg/L	0.00018	0.00017	5.7%	
Total Dissolved Solids	200 mg/L	27,000	26,000	3.8%	
pH	1.7 S.U.	7.3	7.4	1.4%	
Radium 226	0.5 pCi/L	1.0 ± 0.2	0.5 U	NC	± RL
Radium 228	0.8 pCi/L	2.2 ± 0.4	1.7 ± 0.4	26%	± RL
Total Radium	0.8 pCi/L	3.2 ± 0.4	1.7 ± 0.4	61%	J-FD
FC-CCR-MW73-120219 and FC-CCR-FD01-120219					
Chloride	400 mg/L	520	500	3.9%	
Sulfate	400 mg/L	7,100	6,900	2.9%	
Boron	0.050 mg/L	1.6	1.7	6.1%	
Calcium	2.0 mg/L	460	480	4.3%	

TABLE 2
FIELD DUPLICATE DETECTIONS
Coal Combustion Residuals Rule
2019 Compliance Monitoring Groundwater Data

Analyte	Reporting Limit	Primary Result	Duplicate Result	RPD	Notes
Lithium	0.20 mg/L	0.23	0.23	0%	
Barium	0.00050 mg/L	0.020	0.020	0%	
Cobalt	0.00050 mg/L	0.0040	0.0039	2.5%	
Molybdenum	0.00050 mg/L	0.0020	0.0021	4.9%	
Selenium	0.00050 mg/L	0.0086	0.0094	8.9%	
Thallium	0.00010 mg/L	0.00022	0.00021	4.7%	
Total Dissolved Solids	100 mg/L	11,000	11,000	0%	
pH	1.7 S.U.	7.1	7.0	1.4%	
FC-CCR-MW66-120319 and FC-CCR-FD02-120319					
Chloride	400 mg/L	1,800	1,800	0.0%	
Fluoride	0.80 mg/L	22	22	0.0%	
Sulfate	400 mg/L	12,000	14,000	15%	
Boron	0.050 mg/L	130	150	14%	
Calcium	2.0 mg/L	430	460	6.7%	
Lithium	0.20 mg/L	0.32	0.33	3.1%	
Arsenic	0.0015 mg/L	0.0020 U	0.0013	NC	± RL
Barium	0.0010 mg/L	0.024	0.021	13%	
Cobalt	0.0015 mg/L	0.012	0.011	8.7%	
Molybdenum	0.0010 mg/L	0.023	0.020	14%	
Selenium	0.0015 mg/L	0.0020 U	0.0020	NC	± RL
Thallium	0.00020 mg/L	0.0010	0.00083	19%	
Total Dissolved Solids	100 mg/L	19,000	19,000	0%	
pH	1.7 S.U.	7.2	7.3	1.4%	
FC-CCR-MW63-120319 and FC-CCR-FD01-120319					
Fluoride	0.80 mg/L	1.8	1.8	0%	
Boron	0.050 mg/L	1.5	1.6	6.5%	
Calcium	2.0 mg/L	550	560	1.8%	
Total Dissolved Solids	40 mg/L	4,300	4,100	4.8%	
pH	1.7 S.U.	7.1	7.2	1.4%	

Notes:
mg/L = milligrams per liter
NC = not calculable
pCi/L = picoCuries per liter
S.U. = standard units

Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
U = The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
UJ = The analyte was analyzed for, but was not detected. The reported quantitation limit is

TABLE 2
FIELD DUPLICATE DETECTIONS
Coal Combustion Residuals Rule
2019 Compliance Monitoring Groundwater Data

Analyte	Reporting Limit	Primary Result	Duplicate Result	RPD	Notes

approximate and may be inaccurate or imprecise.

Reason Code:

FD = Imprecision between primary and field duplicate results.

TABLE 3
QUALIFIERS ADDED DURING DATA VALIDATION
Coal Combustion Residuals Rule
2019 Compliance Monitoring Groundwater Data

Sample Identification	Sample Delivery Group	Analyte	Result	Qualifier and Reason Code
FC-CCR-MW49A-031919	550-119824	Barium	0.027 mg/L	J BS
FC-CCR-MW49A-031919	550-119824	Selenium	0.0018 mg/L	J HM
FC-CCR-MW75-031919	550-119824	Barium	0.019 mg/L	J BS
FC-CCR-MW15-032019	550-119829	Selenium	0.00071 mg/L	J HM
FC-CCR-MW84-031719	550-119831	Selenium	0.0050 mg/L	J HM
FC-CCR-MW85-032019	550-119831	Chromium	0.0028 mg/L	J FD
FC-CCR-FD01-032019	550-119833	Chromium	0.0010 mg/L	UJ FD
FC-CCR-MW66-031819	550-119833	Selenium	0.0024 mg/L	J HM
FC-CCR-FD01-5619	550-122531	pH	7.5 S.U.	J HT
FC-CCR-FD02-5719	550-122531	pH	7.4 S.U.	J HT
FC-CCR-MW66-5719	550-122531	pH	7.2 S.U.	J HT
FC-CCR-MW66-5719	550-122531	Selenium	0.0021 mg/L	J HM
FC-CCR-MW67-5719	550-122531	pH	7.3 S.U.	J HT
FC-CCR-MW68-5719	550-122531	pH	7.2 S.U.	J HT
FC-CCR-MW69-5719	550-122531	pH	7.3 S.U.	J HT
FC-CCR-MW69-5719	550-122531	Selenium	0.029 mg/L	J HM
FC-CCR-MW70-5719	550-122531	pH	7.1 S.U.	J HT
FC-CCR-MW71-5619	550-122531	pH	7.5 S.U.	J HT
FC-CCR-MW72-5719	550-122531	pH	7.2 S.U.	J HT
FC-CCR-MW73-5619	550-122531	pH	7.2 S.U.	J HT
FC-CCR-MW83-5619	550-122531	pH	7.5 S.U.	J HT
FC-CCR-MW84-5719	550-122531	pH	7.2 S.U.	J HT
FC-CCR-MW85-5719	550-122531	pH	7.3 S.U.	J HT
FC-CCR-MW86-5719	550-122531	pH	7.4 S.U.	J HT
FC-CCR-FD03-5719	550-122532	pH	8.0 S.U.	J HT
FC-CCR-MW62-5719	550-122532	pH	7.2 S.U.	J HT
FC-CCR-MW63-5719	550-122532	pH	7.2 S.U.	J HT
FC-CCR-MW64-5719	550-122532	pH	8.0 S.U.	J HT
FC-CCR-MW65-5719	550-122532	pH	7.9 S.U.	J HT
FC-CCR-DMX4-51419	550-122988	pH	7.6 S.U.	J HT
FC-CCR-DMX6-51419	550-122988	pH	7.2 S.U.	J HT
FC-CCR-FD01-51419	550-122988	pH	7.5 S.U.	J HT
FC-CCR-FD02-51419	550-122988	pH	7.2 S.U.	J HT
FC-CCR-MW15-51419	550-122988	pH	7.0 S.U.	J HT
FC-CCR-MW16-51419	550-122988	pH	7.2 S.U.	J HT
FC-CCR-MW17R-51419	550-122988	pH	7.5 S.U.	J HT
FC-CCR-MW38R-51419	550-122988	pH	7.7 S.U.	J HT
FC-CCR-MW49A-51419	550-122988	pH	7.6 S.U.	J HT
FC-CCR-MW56-51419	550-122988	pH	7.1 S.U.	J HT
FC-CCR-MW57-51419	550-122988	pH	7.4 S.U.	J HT
FC-CCR-MW61-51319	550-122988	pH	8.6 S.U.	J HT

TABLE 3
QUALIFIERS ADDED DURING DATA VALIDATION
Coal Combustion Residuals Rule
2019 Compliance Monitoring Groundwater Data

Sample Identification	Sample Delivery Group	Analyte	Result	Qualifier and Reason Code
FC-CCR-MW6-51419	550-122988	pH	7.3 S.U.	J HT
FC-CCR-MW74-51319	550-122988	pH	7.7 S.U.	J HT
FC-CCR-MW7-51419	550-122988	pH	7.4 S.U.	J HT
FC-CCR-MW75-51319	550-122988	pH	8.4 S.U.	J HT
FC-CCR-MW8-51419	550-122988	pH	7.4 S.U.	J HT
FC-CCR-MW87-51419	550-122988	pH	7.4 S.U.	J HT
FC-CCR-DMX4-111919	550-133678	pH	7.7 S.U.	J HT
FC-CCR-DMX6-111919	550-133678	pH	7.2 S.U.	J HT
FC-CCR-FD01-111919	550-133678	pH	7.5 S.U.	J HT
FC-CCR-FD02-111919	550-133678	Arsenic	0.0014 mg/L	J FD
FC-CCR-FD02-111919	550-133678	pH	7.2 S.U.	J HT
FC-CCR-MW15-111919	550-133678	pH	6.9 S.U.	J HT
FC-CCR-MW16-111919	550-133678	pH	7.1 S.U.	J HT
FC-CCR-MW17R-111919	550-133678	pH	7.4 S.U.	J HT
FC-CCR-MW38R-111919	550-133678	pH	7.5 S.U.	J HT
FC-CCR-MW49A-111919	550-133678	pH	7.5 S.U.	J HT
FC-CCR-MW49A-111919	550-133678	Selenium	0.0010 mg/L	J HM
FC-CCR-MW56-111919	550-133678	pH	7.4 S.U.	J HT
FC-CCR-MW57-111919	550-133678	pH	7.3 S.U.	J HT
FC-CCR-MW61-111919	550-133678	pH	8.6 S.U.	J HT
FC-CCR-MW6-111919	550-133678	pH	7.3 S.U.	J HT
FC-CCR-MW7-111919	550-133678	pH	7.3 S.U.	J HT
FC-CCR-MW75-111919	550-133678	pH	8.3 S.U.	J HT
FC-CCR-MW8-111919	550-133678	pH	7.1 S.U.	J HT
FC-CCR-MW87-111919	550-133678	Arsenic	0.0028 mg/L	J FD
FC-CCR-MW87-111919	550-133678	pH	7.3 S.U.	J HT
FC-CCR-FD01-120219	550-134494	pH	7.0 S.U.	J HT
FC-CCR-FD01-120219	550-134494	Total Dissolved Solids	11,000 mg/L	J HT
FC-CCR-FD02-120319	550-134494	pH	7.3 S.U.	J HT
FC-CCR-MW66-120319	550-134494	pH	7.2 S.U.	J HT
FC-CCR-MW67-120219	550-134494	pH	7.4 S.U.	J HT
FC-CCR-MW67-120219	550-134494	Total Dissolved Solids	20,000 mg/L	J HT
FC-CCR-MW68-120219	550-134494	pH	7.0 S.U.	J HT
FC-CCR-MW68-120219	550-134494	Total Dissolved Solids	15,000 mg/L	J HT
FC-CCR-MW69-120219	550-134494	pH	7.2 S.U.	J HT
FC-CCR-MW69-120219	550-134494	Total Dissolved Solids	13,000 mg/L	J HT
FC-CCR-MW70-120319	550-134494	pH	7.0 S.U.	J HT
FC-CCR-MW71-120219	550-134494	pH	7.2 S.U.	J HT
FC-CCR-MW71-120219	550-134494	Total Dissolved Solids	16,000 mg/L	J HT
FC-CCR-MW72-120219	550-134494	pH	7.1 S.U.	J HT
FC-CCR-MW72-120219	550-134494	Total Dissolved Solids	16,000 mg/L	J HT

TABLE 3
QUALIFIERS ADDED DURING DATA VALIDATION
Coal Combustion Residuals Rule
2019 Compliance Monitoring Groundwater Data

Sample Identification	Sample Delivery Group	Analyte	Result	Qualifier and Reason Code
FC-CCR-MW73-120219	550-134494	pH	7.1 S.U.	J HT
FC-CCR-MW73-120219	550-134494	Total Dissolved Solids	11,000 mg/L	J HT
FC-CCR-MW83-120319	550-134494	pH	7.4 S.U.	J HT
FC-CCR-MW84-120319	550-134494	pH	7.0 S.U.	J HT
FC-CCR-MW85-120319	550-134494	pH	7.0 S.U.	J HT
FC-CCR-MW86-120319	550-134494	pH	7.1 S.U.	J HT
FC-CCR-FD01-120319	550-134500	pH	7.2 S.U.	J HT
FC-CCR-MW62-120319	550-134500	pH	7.2 S.U.	J HT
FC-CCR-MW63-120319	550-134500	pH	7.1 S.U.	J HT
FC-CCR-MW64-120319	550-134500	pH	7.8 S.U.	J HT
FC-CCR-MW65-120319	550-134500	pH	7.6 S.U.	J HT
FC-CCR-FD02-111919		Total Radium	1.7 ± 0.4 pCi/L	J FD
FC-CCR-MW87-111919		Total Radium	3.2 ± 0.4 pCi/L	J FD

Notes:
mg/L = milligrams per liter
pCi/L = picoCuries per liter
S.U. = standard units

Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
UJ = The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

Reason codes:
BS = Laboratory control sample recovery is outside of limits. Result may be biased.
FD = Imprecision between primary sample and field duplicate results.
HM = High matrix spike recovery. Result may be biased high.
HT = The maximum recommended hold time was exceeded and the result should be considered an estimated value.

APPENDIX A

Data Assessment Checklists by Sample Delivery Group

APS Four Corners CCR Data Review

Laboratory Name:	Eurofins TestAmerica Phoenix		
Sample Delivery Group:	550-133678-1	**Review Date:**	01/03/2020
Validator's Name:	Marie Bevier	**Reviewed By:**	Caprielle Larsen

Sample Summary:

Field Sample Identification	Collection Date and Time	Laboratory Sample Identification	Notes
FC-CCR-MW49A-111919	11/19/19 08:07	550-133678-1	
FC-CCR-MW61-111919	11/19/19 09:38	550-133678-2	
FC-CCR-MW75-111919	11/19/19 10:15	550-133678-3	
FC-CCR-MW7-111919	11/19/19 11:56	550-133678-4	
FC-CCR-MW8-111919	11/19/19 12:29	550-133678-5	
FC-CCR-MW87-111919	11/19/19 17:25	550-133678-6	
FC-CCR-MW6-111919	11/19/19 15:43	550-133678-7	
FC-CCR-MW38R-111919	11/19/19 13:09	550-133678-8	
FC-CCR-MW57-111919	11/19/19 13:50	550-133678-9	
FC-CCR-FD01-111919	11/19/19 13:09	550-133678-10	Field duplicate of FC-CCR-MW38R-111919
FC-CCR-MW17R-111919	11/19/19 14:28	550-133678-11	
FC-CCR-MW15-111919	11/19/19 18:46	550-133678-12	
FC-CCR-DMX6-111919	11/19/19 18:11	550-133678-13	
FC-CCR-MW16-111919	11/19/19 19:31	550-133678-14	
FC-CCR-FD02-111919	11/19/19 17:25	550-133678-15	Field duplicate of FC-CCR-MW87-111919
FC-CCR-MW56-111919	11/19/19 15:01	550-133678-16	
FC-CCR-DMX4-111919	11/19/19 16:34	550-133678-17	

Analytical Methods:

Analyte	Analyte Group	Method
Beryllium, Boron, Calcium, Lithium	Metals	EPA 200.7
Antimony, Arsenic, Barium, Cadmium, Chromium, Cobalt, Lead, Molybdenum, Selenium, Thallium	Metals	EPA 200.8
Mercury	Metals	EPA 245.1
Chloride, Fluoride, Sulfate	Anions	EPA 300.0
Total Dissolved Solids	General Chemistry	SM 2540C
pH	General Chemistry	SM 4500 H^+ B

Qualifier Definitions:

J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

R The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

U The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

UJ The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

Sample Receipt Condition:

COC Signed and Complete? (Yes) No

If No, provide details.

Sample Login Matched COC? (Yes) No

If no, provide details.

Sample receipt temperature ≤ 6°C? (Yes) No

1. Samples analyzed for metals within 180 days of sampling? (Yes) No

2. Samples analyzed for mercury, chloride, fluoride, and sulfate within 28 days of sampling?
(Yes) No

3. Samples analyzed for total dissolved solids within 7 days of sampling?
(Yes) No

4. Samples analyzed for pH within 15 minutes of sampling?
Yes (No)

If No:

Sample ID	Analysis	Time Between Collection And Analysis	Effect on data usability
FC-CCR-MW49A-111919	pH	6 days, 10 hours, 38 minutes	J-HT
FC-CCR-MW61-111919	pH	6 days, 9 hours, 7 minutes	J-HT
FC-CCR-MW75-111919	pH	6 days, 8 hours, 30 minutes	J-HT
FC-CCR-MW7-111919	pH	6 days, 6 hours, 49 minutes	J-HT
FC-CCR-MW8-111919	pH	6 days, 6 hours, 16 minutes	J-HT
FC-CCR-MW87-111919	pH	6 days, 1 hour, 20 minutes	J-HT
FC-CCR-MW6-111919	pH	6 days, 3 hours, 2 minutes	J-HT
FC-CCR-MW38R-111919	pH	6 days 5 hours, 36 minutes	J-HT
FC-CCR-MW57-111919	pH	6 days 4 hours, 55 minutes	J-HT
FC-CCR-FD01-111919	pH	6 days, 5 hours, 36 minutes	J-HT
FC-CCR-MW17R-111919	pH	6 days, 4 hours, 43 minutes	J-HT
FC-CCR-MW15-111919	pH	6 days, 1 hour, 59 minutes	J-HT
FC-CCR-DMX6-111919	pH	6 days, 34 minutes	J-HT
FC-CCR-MW16-111919	pH	5 days, 23 hours, 14 minutes	J-HT
FC-CCR-MW56-111919	pH	10 days, 1 hour, 34 minutes	J-HT
FC-CCR-FD02-111919	pH	9 days, 23 hours, 10 minutes	J-HT
FC-CCR-DMX4-111919	pH	10 days, 1 minute	J-HT

Note:

HT = The maximum recommended hold time was exceeded, and the result should be considered an estimated value.

5. Target analytes detected in the blanks? Yes (No)

If Yes:

Detected Analyte	Concentration	Samples with concentrations less than 5 times the blank detection

6. LCS recoveries within laboratory-specified limits? (Yes) No

If No:

Analyte	Recovery	Affected Samples	Effect on Data Usability

7. MS performed on a project-specific sample? (Yes) No

If Yes:

Spiked Sample ID	Spiked Analyte(s)
FC-CCR-MW49A-111919	Chloride, Fluoride, Sulfate. Beryllium, Boron, Calcium, Lithium, Potassium, Magnesium, Sodium, Antimony, Barium, Cadmium, Chromium, Cobalt, Lead, Molybdenum, Selenium, Thallium, Arsenic, Mercury

a. Are MS recoveries and/or precision within laboratory specified limits?

Yes (No) Not Applicable

If No:

Sample ID	Analyte	RPD or Recovery	Accuracy or Recovery Limits	Effect on Data Usability
FC-CCR-MW49A-111919	Boron	65%, 68%	70 – 130%	None [A]
	Calcium	14%, 24%	70 – 130%	None [A]
	Magnesium	42%, 13%	70 – 130%	None [A]
	Sodium	-292%, -277%	70 – 130%	None [A]
	Selenium	140%, 138%	70 – 130%	J-HM
	Mercury	135%, 132%	70 – 130%	None [B]

Notes:

[A] = It is not possible to assess data usability for this analyte because the concentration detected in the unspiked native sample was more than four times the spike concentration.

[B] = The analyte was not detected in the unspiked native sample and data usability Is not adversely affected by the potential high analytical bias.

HM = High matrix spike recovery. Result may be biased high.

8. Field duplicate collected? (Yes) No

If Yes:

Parent Sample	Field Duplicate
FC-CCR-MW38R-111919	FC-CCR-FD01-111919
FC-CCR-MW87-111919	FC-CCR-FD02-111919

a. Is the RPD between primary and duplicate results ≤ 20% or is the difference between analyte concentrations ≤ the reporting limit? Yes (No) Not Applicable

If No:

Analyte	Reporting Limit	Primary Result	Duplicate Result	RPD	Notes
FC-CCR-MW38R-111919 and FC-CCR-FD01-111919					
Chloride	150 mg/L	270	270	0%	
Sulfate	300 mg/L	4,000	4,000	0%	
Boron	0.050 mg/L	26	27	3.8%	
Calcium	2.0 mg/L	450	450	0%	
Lithium	0.20 mg/L	0.37	0.37	0%	
Arsenic	0.00050 mg/L	0.00050 U	0.00064	NC	± RL
Barium	0.00050 mg/L	0.020	0.019	5.1%	
Cadmium	0.00010 mg/L	0.00013	0.00015	14%	
Chromium	0.0010 mg/L	0.0011	0.0011	0%	
Cobalt	0.00050 mg/L	0.23	0.23	0%	
Molybdenum	0.00050 mg/L	0.0050	0.0049	2.0%	
Selenium	0.00050 mg/L	0.0010	0.00080	22%	± RL
Total Dissolved Solids	100 mg/L	6,100	5,900	3.3%	
pH	1.7 S.U.	7.5	7.5	0%	

Analyte	Reporting Limit	Primary Result	Duplicate Result	RPD	Notes
FC-CCR-MW86-5719 and FC-CCR-FD02-5719					
Chloride	400 mg/L	1,600	1,700	6.1%	
Sulfate	400 mg/L	18,000	18,000	0%	
Boron	0.050 mg/L	2.4	2.4	0%	
Calcium	2.0 mg/L	420	440	4.7%	
Lithium	0.20 mg/L	1.2	1.3	8%	
Arsenic	0.0010 mg/L	0.0028	0.0014	67%	J-FD
Barium	0.00050 mg/L	0.015	0.015	0%	
Cadmium	0.00010 mg/L	0.00024	0.00024	0%	
Cobalt	0.00050 mg/L	0.0037	0.0036	2.7%	
Molybdenum	0.00050 mg/L	0.030	0.028	6.9%	
Selenium	0.00050 mg/L	0.015	0.018	18%	
Thallium	0.00010 mg/L	0.00018	0.00017	5.7%	
Total Dissolved Solids	200 mg/L	27,000	26,000	3.8%	
pH	1.7 S.U.	7.3	7.4	1.4%	

Notes:

NC = not calculable

±RL = The difference between results was less than the reporting limit, indicating acceptable precision.

FD = Imprecision between primary and field duplicate results

9. Did the laboratory perform duplicate analyses on project-specific samples?

(Yes) No

If Yes:

Sample ID	Analysis
FC-CCR-MW49A-111919	Total Dissolved Solids, pH
FC-CCR-MW17R-111919	Total Dissolved Solids
FC-CCR-MW8-111919	pH
FC-CCR-FD02-111919	pH

a. Is the RPD between duplicate results within laboratory-specified limits or is the difference between analyte concentrations less than the reporting limit?

(Yes) No Not Applicable

If No:

Sample ID	Analyte	Effect on Data Usability

10. Are non-detect results sufficiently low to meet EPA primary drinking water criteria and/or Alternative GWPS?

Yes (No)

Analyte	List	MCL	Alternative GWPS	Units
Antimony	Appendix IV	0.006	--	mg/L
Arsenic	Appendix IV	0.010	--	mg/L
Barium	Appendix IV	2	--	mg/L
Beryllium	Appendix IV	0.004	--	mg/L
Boron	Appendix III	--	--	mg/L
Cadmium	Appendix IV	0.005	--	mg/L
Calcium	Appendix III	--	--	mg/L
Chloride	Appendix III	--	--	mg/L
Chromium	Appendix IV	0.1	--	mg/L
Cobalt	Appendix IV	--	0.006	mg/L
Fluoride	Appendix III/IV	4.0	0.8	mg/L
Lead	Appendix IV	--	0.015	mg/L
Lithium	Appendix IV	--	0.040	mg/L
Mercury	Appendix IV	0.002	--	mg/L
Molybdenum	Appendix IV	--	0.1	mg/L
pH	Appendix III	--	--	S.U.
Radium 226 + Radium 228	Appendix IV	5	--	pCi/L
Selenium	Appendix IV	0.05	--	mg/L
Sulfate	Appendix III	--	--	mg/L
Total Dissolved Solids	Appendix III	--	--	mg/L
Thallium	Appendix IV	0.002	--	mg/L

If No, list affected samples and analytes.

Sample ID	Analyte	Reporting Limit
FC-CCR-MW49A-111919	Lithium	0.20 mg/L
FC-CCR-FD01-111919	Lithium	0.20 mg/L
FC-CCR-MW17R-111919	Lithium	0.20 mg/L
FC-CCR-MW15-111919	Lithium	0.20 mg/L
FC-CCR-DMX6-111919	Lithium	0.20 mg/L
FC-CCR-MW16-111919	Lithium	0.20 mg/L
FC-CCR-FD02-111919	Lithium	0.20 mg/L
FC-CCR-MW56-111919	Lithium	0.20 mg/L
FC-CCR-DMX4-111919	Lithium	0.20 mg/L
FC-CCR-MW61-111919	Lithium	0.20 mg/L
FC-CCR-MW75-111919	Lithium	0.20 mg/L
FC-CCR-MW7-111919	Lithium	0.20 mg/L
FC-CCR-MW8-111919	Lithium	0.20 mg/L
FC-CCR-MW87-111919	Lithium	0.20 mg/L
FC-CCR-MW6-111919	Lithium	0.20 mg/L

Sample ID	Analyte	Reporting Limit
FC-CCR-MW38R-111919	Lithium	0.20 mg/L
FC-CCR-MW57-111919	Lithium	0.20 mg/L

APS Four Corners CCR Data Review

Laboratory Name:	Eurofins TestAmerica Phoenix		
Sample Delivery Group:	550-134494-1	**Review Date:**	01/08/2020
Validator's Name:	Marie Bevier	**Reviewed By:**	Caprielle Larsen

Sample Summary:

Field Sample Identification	Collection Date and Time	Laboratory Sample Identification	Notes
FC-CCR-MW66-120319	12/03/19 14:45	550-134494-1	
FC-CCR-MW67-120219	12/02/19 18:59	550-134494-2	Logged in with a sample date of 12/03/19
FC-CCR-MW68-120219	12/02/19 17:31	550-134494-3	Logged in with a sample date of 12/03/19
FC-CCR-MW69-120219	12/02/19 16:50	550-134494-4	Logged in with a sample date of 12/03/19
FC-CCR-MW70-120319	12/03/19 15:45	550-134494-5	
FC-CCR-MW71-120219	12/02/19 15:06	550-134494-6	
FC-CCR-MW72-120219	12/02/19 16:02	550-134494-7	
FC-CCR-MW73-120219	12/02/19 14:08	550-134494-8	
FC-CCR-MW83-120319	12/03/19 09:52	550-134494-9	Logged in with a sample date of 12/02/19
FC-CCR-FD01-120219	12/02/19 14:08	550-134494-10	Field duplicate of FC-CCR-MW73-120219
FC-CCR-MW84-120319	12/03/19 07:57	550-134494-11	
FC-CCR-MW85-120319	12/03/19 08:47	550-134494-12	
FC-CCR-MW86-120319	12/03/19 13:56	550-134494-13	
FC-CCR-FD02-120319	12/03/19 14:45	550-134494-14	Field duplicate of FC-CCR-MW66-120319

Analytical Methods:

Analyte	Analyte Group	Method
Beryllium, Boron, Calcium, Lithium	Metals	EPA 200.7
Antimony, Arsenic, Barium, Cadmium, Chromium, Cobalt, Lead, Molybdenum, Selenium, Thallium	Metals	EPA 200.8
Mercury	Metals	EPA 245.1
Chloride, Fluoride, Sulfate	Anions	EPA 300.0
Total Dissolved Solids	General Chemistry	SM 2540C
pH	General Chemistry	SM 4500 H^+ B

Qualifier Definitions:

J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

R The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

U The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

UJ The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

Sample Receipt Condition:

COC Signed and Complete? (Yes) No

If No, provide details.

Sample Login Matched COC? Yes (No)

If no, provide details.

According to the COC, samples FC-CCR-MW67, FC-CCR-MW68-120219, and FC-CCR-MW69-120219 were collected on 2 December 2019; however, the laboratory logged these samples with collection dates of 3 December 2019. Similarly, the COC indicates that sample FC-CCR-MW83-120319 was collected on 3 December 2019; however, the laboratory logged the sample with a collection date of 2 December 2019.

Sample receipt temperature ≤ 6°C? (Yes) No

1. Samples analyzed for metals within 180 days of sampling? (Yes) No

2. Samples analyzed for mercury, chloride, fluoride, and sulfate within 28 days of sampling?

   (Yes) No

3. Samples analyzed for total dissolved solids within 7 days of sampling?

   Yes (No)

4. Samples analyzed for pH within 15 minutes of sampling?

   Yes (No)

If No:

Sample ID	Analysis	Time Between Collection And Analysis	Effect on data usability
FC-CCR-MW66-120319	pH	8 days, 23 hours, 29 minutes	J-HT
FC-CCR-MW67-120219	Total Dissolved Solids	8 Days	J-HT
FC-CCR-MW67-120219	pH	9 days, 19 hours, 15 minutes	J-HT
FC-CCR-MW68-120219	Total Dissolved Solids	8 Days	J-HT
FC-CCR-MW68-120219	pH	9 days, 6 hours, 29 minutes	J-HT
FC-CCR-MW69-120219	Total Dissolved Solids	8 Days	J-HT
FC-CCR-MW69-120219	pH	9 days, 21 hours, 24 minutes	J-HT
FC-CCR-MW70-120319	pH	8 days, 22 hours, 29 minutes	J-HT
FC-CCR-MW71-120219	Total Dissolved Solids	8 Days	J-HT
FC-CCR-MW71-120219	pH	9 days, 23 hours, 8 minutes	J-HT
FC-CCR-MW72-120219	Total Dissolved Solids	8 Days	J-HT
FC-CCR-MW72-120219	pH	9 days, 22 hours, 12 minutes	J-HT
FC-CCR-MW73-120219	Total Dissolved Solids	8 Days	J-HT
FC-CCR-MW73-120219	pH	10 days, 6 minutes	J-HT
FC-CCR-MW83-120319	pH	10 days, 4 hours, 22 minutes	J-HT
FC-CCR-FD01-120219	Total Dissolved Solids	8 Days	J-HT
FC-CCR-FD01-120219	pH	10 days, 6 minutes	J-HT
FC-CCR-MW84-120319	pH	9 days, 6 hours, 17 minutes	J-HT
FC-CCR-MW85-120319	pH	9 days, 5 hours, 27 minutes	J-HT
FC-CCR-MW86-120319	pH	9 days, 18 minutes	J-HT
FC-CCR-FD02-120319	pH	8 days, 23 hours, 29 minutes	J-HT

Note:

HT = The maximum recommended hold time was exceeded, and the result should be considered an estimated value.

5. Target analytes detected in the blanks? Yes (No)

If Yes:

Detected Analyte	Concentration	Samples with concentrations less than 5 times the blank detection

6. LCS recoveries within laboratory-specified limits? (Yes) No

If No:

Analyte	Recovery	Affected Samples	Effect on Data Usability

7. MS performed on a project-specific sample? (Yes) No

If Yes:

Spiked Sample ID	Spiked Analyte(s)
FC-CCR-MW71-120219	Fluoride, Chloride, Sulfate, Beryllium, Calcium, Lithium, Boron, Antimony, Arsenic, Barium, Cadmium, Cobalt, Lead, Molybdenum, Selenium, Thallium, Chromium, Mercury

a. Are MS recoveries and/or precision within laboratory specified limits?

Yes (No) Not Applicable

If No:

Sample ID	Analyte	RPD or Recovery	Accuracy or Recovery Limits	Effect on Data Usability
FC-CCR-MW71-120219	Calcium	-19%, -23%	70 – 130%	None [A]

Note:

[A] = It is not possible to assess data usability for this analyte because the concentration detected in the unspiked native sample was more than four times the spike concentration.

8. Field duplicate collected? (Yes) No

If Yes:

Parent Sample	Field Duplicate
FC-CCR-MW73-120219	FC-CCR-FD01-120219
FC-CCR-MW66-120319	FC-CCR-FD02-120319

a. Is the RPD between primary and duplicate results ≤ 20% or is the difference between analyte concentrations ≤ the reporting limit? (Yes) No Not Applicable

If No:

Analyte	Reporting Limit	Primary Result	Duplicate Result	RPD	Notes
FC-CCR-MW73-120219 and FC-CCR-FD01-120219					
Chloride	400 mg/L	520	500	3.9%	
Sulfate	400 mg/L	7,100	6,900	2.9%	
Boron	0.050 mg/L	1.6	1.7	6.1%	
Calcium	2.0 mg/L	460	480	4.3%	
Lithium	0.20 mg/L	0.23	0.23	0%	
Barium	0.00050 mg/L	0.020	0.020	0%	
Cobalt	0.00050 mg/L	0.0040	0.0039	2.5%	
Molybdenum	0.00050 mg/L	0.0020	0.0021	4.9%	
Selenium	0.00050 mg/L	0.0086	0.0094	8.9%	
Thallium	0.00010 mg/L	0.00022	0.00021	4.7%	
Total Dissolved Solids	100 mg/L	11,000	11,000	0%	
pH	1.7 S.U.	7.1	7.0	1.4%	

Analyte	Reporting Limit	Primary Result	Duplicate Result	RPD	Notes
FC-CCR-MW66-120319 and FC-CCR-FD02-120319					
Chloride	400 mg/L	1,800	1,800	0.0%	
Fluoride	0.80 mg/L	22	22	0.0%	
Sulfate	400 mg/L	12,000	14,000	15%	
Boron	0.050 mg/L	130	150	14%	
Calcium	2.0 mg/L	430	460	6.7%	
Lithium	0.20 mg/L	0.32	0.33	3.1%	
Arsenic	0.0015 mg/L	0.0020 U	0.0013	NC	± RL
Barium	0.0010 mg/L	0.024	0.021	13%	
Cobalt	0.0015 mg/L	0.012	0.011	8.7%	
Molybdenum	0.0010 mg/L	0.023	0.020	14%	
Selenium	0.0015 mg/L	0.0020 U	0.0020	NC	± RL
Thallium	0.00020 mg/L	0.0010	0.00083	19%	
Total Dissolved Solids	100 mg/L	19,000	19,000	0%	
pH	1.7 S.U.	7.2	7.3	1.4%	

Notes:

NC = not calculable
±RL = The difference between results was less than the reporting limit, indicating acceptable precision.

9. Did the laboratory perform duplicate analyses on project-specific samples?

(Yes) No

If Yes:

Sample ID	Analysis
FC-CCR-MW71-120219	Total Dissolved Solids, pH

a. Is the RPD between duplicate results within laboratory-specified limits or is the difference between analyte concentrations less than the reporting limit?

(Yes) No Not Applicable

If No:

Sample ID	Analyte	Effect on Data Usability

10. Are non-detect results sufficiently low to meet EPA primary drinking water criteria and/or Alternative GWPS?

Yes (No)

Analyte	List	MCL	Alternative GWPS	Units
Antimony	Appendix IV	0.006	--	mg/L
Arsenic	Appendix IV	0.010	--	mg/L
Barium	Appendix IV	2	--	mg/L
Beryllium	Appendix IV	0.004	--	mg/L
Boron	Appendix III	--	--	mg/L
Cadmium	Appendix IV	0.005	--	mg/L
Calcium	Appendix III	--	--	mg/L
Chloride	Appendix III	--	--	mg/L
Chromium	Appendix IV	0.1	--	mg/L
Cobalt	Appendix IV	--	0.006	mg/L
Fluoride	Appendix III/IV	4.0	0.8	mg/L
Lead	Appendix IV	--	0.015	mg/L
Lithium	Appendix IV	--	0.040	mg/L
Mercury	Appendix IV	0.002	--	mg/L
Molybdenum	Appendix IV	--	0.1	mg/L
pH	Appendix III	--	--	S.U.
Radium 226 + Radium 228	Appendix IV	5	--	pCi/L
Selenium	Appendix IV	0.05	--	mg/L
Sulfate	Appendix III	--	--	mg/L
Total Dissolved Solids	Appendix III	--	--	mg/L
Thallium	Appendix IV	0.002	--	mg/L

If No, list affected samples and analytes.

Sample ID	Analyte	Reporting Limit
FC-CCR-MW83-120319	Lithium	0.20
FC-CCR-MW84-120319	Lithium	0.20

APS Four Corners CCR Data Review

Laboratory Name:	Eurofins TestAmerica Phoenix		
Sample Delivery Group:	550-134500-1	**Review Date:**	01/08/2020
Validator's Name:	Marie Bevier	**Reviewed By:**	Caprielle Larsen

Sample Summary:

Field Sample Identification	Collection Date and Time	Laboratory Sample Identification	Notes
FC-CCR-MW62-120319	12/03/19 13:22	550-134500-1	
FC-CCR-MW63-120319	12/03/19 10:40	550-134500-2	
FC-CCR-MW64-120319	12/03/19 11:17	550-134500-3	
FC-CCR-FD01-120319	12/03/19 10:40	550-134500-4	Field duplicate of FC-CCR-MW63-120319
FC-CCR-MW65-120319	12/03/19 12:43	550-134500-5	

Analytical Methods:

Analyte	Analyte Group	Method
Boron, Calcium, Lithium	Metals	EPA 200.7
Fluoride	Anions	EPA 300.0
Total Dissolved Solids	General Chemistry	SM 2540C
pH	General Chemistry	SM 4500 H^+ B

Qualifier Definitions:

J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

R The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

U The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

UJ The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

Sample Receipt Condition:

COC Signed and Complete? (Yes) No

If No, provide details.

Sample Login Matched COC? (Yes) No

If no, provide details.

Sample receipt temperature ≤ 6°C? (Yes) No

1. Samples analyzed for metals within 180 days of sampling? (Yes) No

2. Samples analyzed for fluoride within 28 days of sampling?

(Yes) No

3. Samples analyzed for total dissolved solids within 7 days of sampling?

(Yes) No

4. Samples analyzed for pH within 15 minutes of sampling?

Yes (No)

If No:

Sample ID	Analysis	Time Between Collection And Analysis	Effect on data usability
FC-CCR-MW62-120319	pH	9 days, 52 minutes	J-HT
FC-CCR-MW63-120319	pH	9 Days, 3 Hours, 34 minutes	J-HT
FC-CCR-MW64-120319	pH	9 days, 2 hours, 57 minutes	J-HT
FC-CCR-FD01-120319	pH	9 Days, 3 Hours, 34 Minutes	J-HT
FC-CCR-MW65-120319	pH	9 days, 1 hour, 31 minutes	J-HT

Note:

HT = The maximum recommended hold time was exceeded, and the result should be considered an estimated value.

5. Target analytes detected in the blanks? Yes (No)

If Yes:

Detected Analyte	Concentration	Samples with concentrations less than 5 times the blank detection

6. LCS recoveries within laboratory-specified limits? (Yes) No

If No:

Analyte	Recovery	Affected Samples	Effect on Data Usability

7. MS performed on a project-specific sample? (Yes) No

If Yes:

Spiked Sample ID	Spiked Analyte(s)
FC-CCR-MW64-120319	Fluoride
FC-CCR-MW62-120319	Fluoride, Lithium, Boron, Calcium

a. Are MS recoveries and/or precision within laboratory specified limits?

Yes (No) Not Applicable

If No:

Sample ID	Analyte	RPD or Recovery	Accuracy or Recovery Limits	Effect on Data Usability
FC-CCR-MW62-120319	Calcium	32%, -35%	70 – 130%	None [A]

Note:

[A] = It is not possible to assess data usability for this analyte because the concentration detected in the unspiked native sample was more than four times the spike concentration.

8. Field duplicate collected? (Yes) No

If Yes:

Parent Sample	Field Duplicate
FC-CCR-MW63-120319	FC-CCR-FD01-120319

a. Is the RPD between primary and duplicate results ≤ 20% or is the difference between analyte concentrations ≤ the reporting limit? (Yes) No Not Applicable

If No:

Analyte	Reporting Limit	Primary Result	Duplicate Result	RPD	Notes
FC-CCR-MW63-120319 and FC-CCR-FD01-120319					
Fluoride	0.80 mg/L	1.8	1.8	0%	
Boron	0.050 mg/L	1.5	1.6	6.5%	
Calcium	2.0 mg/L	550	560	1.8%	
Total Dissolved Solids	40 mg/L	4,300	4,100	4.8%	
pH	1.7 S.U.	7.1	7.2	1.4%	

9. Did the laboratory perform duplicate analyses on project-specific samples?

(Yes) No

If Yes:

Sample ID	Analysis
FC-CCR-MW62-120319	Total Dissolved Solids, pH

a. Is the RPD between duplicate results within laboratory-specified limits or is the difference between analyte concentrations less than the reporting limit?

(Yes) No Not Applicable

If No:

Sample ID	Analyte	Effect on Data Usability

10. Are non-detect results sufficiently low to meet EPA primary drinking water criteria and/or Alternative GWPS?

Yes (No)

Analyte	List	MCL	Alternative GWPS	Units
Antimony	Appendix IV	0.006	--	mg/L
Arsenic	Appendix IV	0.010	--	mg/L
Barium	Appendix IV	2	--	mg/L
Beryllium	Appendix IV	0.004	--	mg/L
Boron	Appendix III	--	--	mg/L
Cadmium	Appendix IV	0.005	--	mg/L
Calcium	Appendix III	--	--	mg/L
Chloride	Appendix III	--	--	mg/L
Chromium	Appendix IV	0.1	--	mg/L
Cobalt	Appendix IV	--	0.006	mg/L
Fluoride	Appendix III/IV	4.0	0.8	mg/L
Lead	Appendix IV	--	0.015	mg/L
Lithium	Appendix IV	--	0.040	mg/L
Mercury	Appendix IV	0.002	--	mg/L
Molybdenum	Appendix IV	--	0.1	mg/L
pH	Appendix III	--	--	S.U.
Radium 226 + Radium 228	Appendix IV	5	--	pCi/L
Selenium	Appendix IV	0.05	--	mg/L
Sulfate	Appendix III	--	--	mg/L
Total Dissolved Solids	Appendix III	--	--	mg/L
Thallium	Appendix IV	0.002	--	mg/L

If No, list affected samples and analytes.

Sample ID	Analyte	Reporting Limit
FC-CCR-MW62-120319	Lithium	0.20
FC-CCR-MW63-120319	Lithium	0.20
FC-CCR-MW64-120319	Lithium	0.20
FC-CCR-FD01-120319	Lithium	0.20
FC-CCR-MW65-120319	Lithium	0.20

APPENDIX E

WOOD TECHNICAL MEMORANDUM DOCUMENTING THE STATISTICAL ANALYSIS OF APPENDIX III CONSTITUENT DATA COLLECTED FROM THE CWTP IN NOVEMBER 2018

Technical Memorandum

To:	Michele Robertson, RG Pamela Norris	**File No:**	1420192014.****.2
From:	Natalie Chrisman Lazarr, PE Carla Landrum, PhD	**cc:**	File
Date:	April 15, 2019		

Subject: **CCR GROUNDWATER DETECTION MONITORING**
EVALUATION OF NOVEMBER 2018 DATA COLLECTED FROM THE CWTP
Arizona Public Service Four Corners Power Plant – Fruitland, New Mexico

1.0 INTRODUCTION

This Technical Memorandum (Tech Memo) documents an evaluation of detection monitoring data collected in November 2018 from the Combined Waste Treatment Pond (CWTP) located at the Arizona Public Service (APS) Four Corners Power Plant (FCPP) in Fruitland, New Mexico. The information in this Tech Memo is inclusive of the CWTP CCR Groundwater Detection Monitoring findings declared in the June 2018 Technical Memorandum (June 2018 Tech Memo) (Wood, 2018a). The evaluation consists of comparing CWTP compliance (i.e., downgradient) sample data to Appendix III background threshold values (BTVs) using the prediction limit statistical method declared in the *Statistical Analysis of Initial Detection Monitoring Appendix III Constituent Data* Technical Memorandum (January 2018 Tech Memo) (Amec Foster Wheeler Environment and Infrastructure, Inc. [Amec Foster Wheeler], 2018). This Tech Memo, as well as the June 2018 Tech Memo and the January 2018 Tech Memo, were prepared pursuant to the Coal Combustion Residuals (CCR) Rule and the *Statistical Data Analysis Work Plan* (Wood, 2018b) developed for the site.

2.0 EVALUATION

Table 1 presents the concentrations of Appendix III constituents in samples collected from CWTP compliance monitoring wells MW-62, MW-63, MW-64 and MW-65 on November 2, 2018. APS recognizes this sampling event as the second detection monitoring event of 2018 at the CWTP. Applicable BTVs are presented in Table 1 for comparison.

2.1 Historical Updates to Background Threshold Values

The June 2018 Tech Memo declares updates to the CWTP BTVs for fluoride and pH and these updates are reflected in Table 1. The June 2018 Tech Memo provides clarification and justification for these BTV updates.

2.2 Exceedance Assessment

Table 1 indicates the November 2018 sample concentrations for chloride, sulfate and total dissolved solids are less than their respective BTVs. At the current time, there is insufficient evidence to declare an initial exceedance for these constituents.

Boron exhibits an initial exceedance at MW-62 for the November 2018 sampling event. In accordance with the rationale presented in the January 2018 Tech Memo which is based on the US EPA's Unified Guidance

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(U.S. EPA, 2009), this exceedance triggers a 1 of 3 resampling strategy to confirm that the November 2018 exceedance is not a false positive exceedance. Historically, this well triggered a 1 of 3 resampling strategy in response to an initial exceedance for boron on October 17, 2017 (Amec Foster Wheeler, 2018). The June 3, 2018 sampling event nullified the October 17, 2017 initial exceedance because the boron concentration was below the respective BTV (Wood, 2018a).

For calcium, there are initial exceedances in samples collected from MW-62 and MW-63 for the November 2018 sampling event. A 1 of 2 resampling strategy is in effect for calcium at the CWTP. The technical basis for the 1 of 2 resampling strategy is put forth in the January 2018 Tech Memo and the US EPA's Unified Guidance (U.S. EPA, 2009). Initial exceedances of calcium at MW-62 and MW-63 previously triggered 1 of 2 resampling during the initial statistical analysis of detection monitoring data documented in the January 2018 Tech Memo. The April 6, 2018 sampling event nullified these initial exceedances because the calcium concentrations were less than the respective BTV (Wood, 2018c)

The Double Quantification Rule (DQR) is in effect for fluoride. The DQR states that a confirmed exceedance is declared if downgradient wells exhibit quantifiable measurements at or above the reporting limit in two consecutive sample and resample events (U.S. EPA, 2009, page 6-11). The June 2018 Tech Memo documented detectable fluoride concentrations in all downgradient wells, thereby declaring an initial exceedance for fluoride at these wells (Wood 2018a). Table 1 indicates that downgradient monitoring wells MW-62, MW-63 and MW-64 exhibit detectable fluoride concentrations above the 0.8 mg/L reporting limit for the November 2018 sampling event. The detectable fluoride concentrations in these downgradient wells for the consecutive June 2018 and November 2018 sampling events provide enough evidence to declare a statistically significant increase (SSI) over the fluoride BTV at the CWTP.

For pH, the June 2018 sampling event triggered a 1 of 2 resampling strategy for monitoring wells MW-64 and MW-65 because pH values at these monitoring locations exceeded the upper BTV for this constituent. The initial exceedance in pH triggered resampling to confirm the June 2018 pH exceedances are not false positives. The technical basis for the 1 of 2 resampling strategy is put forth in the January 2018 Tech Memo and the US EPA's Unified Guidance (U.S. EPA, 2009). Table 1 shows the November 2018 pH sample values in MW-64 and MW-65 exceed the upper BTV for this constituent. Because pH values in MW-64 and MW-65 exceed the upper BTV for the consecutive June 2018 and November 2018 sampling events, there is sufficient evidence to declare an SSI over background for pH at the CWTP.

3.0 RECOMMENDATIONS

The initial exceedances for boron and calcium, in addition to the SSI declarations for fluoride and pH, under the detection monitoring program warrant further action at the CWTP. Without other SSI declarations for the unit, resampling for boron and calcium would be recommended. However, given the past initial exceedances for boron and calcium and the fluoride and pH SSI declarations, we recommend that an alternative source demonstration (ASD) be conducted to evaluate boron, calcium, fluoride, and pH at the CWTP. The ASD must be completed within 90 days following the date of this Tech Memo. If there is enough evidence to conclude that the declared SSIs and initial exceedances are due to an alternative source, then the CWTP is in compliance and can continue with detection monitoring.

As part of the ASD investigation, the adequacy and representativeness of background warrants further investigation. Currently, the statistical analysis assumes the CWTP is observing the same groundwater type as background monitoring wells MW-71, MW-72 and MW-73. Documented spatial heterogeneity at the FCPP suggests that there might be more than one groundwater type observed between the CWTP downgradient wells and the designated background wells. To help investigate if groundwater types are

similar between background and downgradient monitoring wells at the CWTP, we recommend performing statistical "fingerprinting" analysis (e.g. multivariate chemical correlation analysis) and updating statistical temporal trend analysis (for chemical constituents and groundwater elevations) in all monitoring wells as part of a comprehensive ASD plan. If the ASD indicates there is more than one groundwater type sampled between background and downgradient monitoring wells and/or there are differences between background and compliance wells in analyte concentrations that are not present in CCR Unit, then the stated statistical assumption is not valid and the interwell detection monitoring statistical comparisons are not valid. Intrawell statistical comparisons are more appropriate for sites where adequate and representative background cannot be established.

4.0 REFERENCES

Amec Foster Wheeler Environment and Infrastructure, Inc. (Amec Foster Wheeler; now known as Wood Environment and Infrastructure Solutions, Inc. [Wood]), 2018. *Statistical Analysis of Initial Detection Monitoring Appendix III Constituent Data*. Arizona Public Service Four Corners Power Plant – Fruitland, New Mexico. Technical Memorandum dated January 12, 2018 and revised August 20, 2018.

U.S. Environmental Protection Agency (U.S. EPA), 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance. EPA 530/R-09-007. Environmental Protection Agency Office of Resource Conservation and Recovery.

Wood, 2018a. CWTP Detection Monitoring – Evaluation of June 2018 Resampling Data. Arizona Public Service Four Corners Power Plant – Fruitland, New Mexico. Technical Memorandum dated October 15, 2018.

Wood, 2018b. *Statistical Data Analysis Work Plan*. Coal Combustion Residual Rule Groundwater Monitoring System Compliance. Four Corners Power Plant, Fruitland, New Mexico. Report prepared for Arizona Public Service. Updated October 15, 2018.

Wood, 2018c. CWTP Detection Monitoring – Evaluation of April 2018 Resampling Data. Arizona Public Service Four Corners Power Plant – Fruitland, New Mexico. Technical Memorandum dated April 25, 2018.

TABLES

Table 1
Detection Monitoring Data Collected from the CWTP in 2018

Well	Sample Date	Boron[1] (mg/L)	Calcium (mg/L)	Chloride (mg/L)	Fluoride[2] (mg/L)	Sulfate (mg/L)	TDS (mg/L)	pH[3] (S.U.)
MW-62	10/13/2017	**2.2**	---	---	---	---	---	---
	4/6/2018	**2.1**	---	---	---	---	---	---
	6/3/2018	1.8	490	120	**1.6**	3500	5900	6.59
	11/2/2018	**2.4**	**550**	110	**1.5**	3300	5600	6.46
MW-63	6/3/2018	1.4	510	90	**1.7**	2600	4500	6.76
	11/2/2018	1.9	**550**	88	**1.9**	2800	4300	6.66
MW-64	6/3/2018	0.48	85	50	**1.4**	390	800	**7.54**
	11/2/2018	0.64	88	50	**1.4**	350	760	**7.43**
MW-65	6/3/2018	0.62	98	52	**1.9**	480	1000	**7.22**
	11/2/2018	0.77	100	51	**1.9**	420	940	**7.18**
Not to Exceed Upper BTV		*1.9*	*540*	*710*	*0.8*	*13,000*	*20,000*	*7.04*
Not to Exceed Lower BTV		---	---	---	---	---	---	*6.33*

Notes:
BTV = Background Threshold Value
mg/L = milligrams per liter
S.U. = standard units
TDS = total dissolved solids

2.2 *Concentration exceeds applicable BTV*

[1] A 1 of 3 resampling strategy was implemented after intial review of Appendix III constituent data (Amec Foster Wheeler, 2018). The October 2107 and April 2018 concentrations exceeded the BTV (Wood, 2018) but the June 2018 concentration was less than the BTV. On this basis, there was insufficient evidence to declare a statistically significant increase over background as all three sample results must exceed the BTV to declare an exceedance at that time.

[2] Fluoride was not detected (with a reporting limit of 0.8 mg/L) in background well samples (i.e., MW-71, MW-72, and MW-73) collected in June 2018 and in November 2018. Since the Double Quantification Rule (DQR) is in effect and the reporting limits for both the background and downgradient wells were consistent, the detected concentrations in downgradient wells represent a confirmed exceedance for fluoride over background.

[3] Grouped background sample data (MW-71, MW-72 and MW-73) supported a statistically significant ($p<0.05$) decreasing temporal trend in pH prior to June 2018, meaning pH values change over time. Trend testing subsequent to incorporating the June 2018 sampling data indicate the trend is no longer statistically signficant ($p<0.05$). Therefore, the upper and lower BTVs reflect a traditional parametric prediction limit calculation with a 1 of 2 resampling strategy. Elevated pH values at MW-64 and MW-65 represent an intial exceedance.

APPENDIX F

WOOD TECHNICAL MEMORANDUM DOCUMENTING THE STATISTICAL ANALYSIS OF APPENDIX III CONSTITUENT DATA COLLECTED FROM THE CWTP IN MAY 2019

Technical Memorandum

To:	Michele Robertson, RG Pamela Norris	**File No:**	14-2018-2040
From:	Tim Glover	**Reviewed by:**	Natalie Chrisman Lazarr, PE Louis S. Venne, PhD
Date:	October 15, 2019		

Subject: **CCR GROUNDWATER DETECTION MONITORING**
STATISTICAL ANALYSIS AND RESULTS FOR THE CWTP
APPENDIX III CONSTITUENT DATA COLLECTED THROUGH MAY 2019
Arizona Public Service Four Corners Power Plant – Fruitland, New Mexico

1.0 INTRODUCTION

This Technical Memorandum (Tech Memo) documents the ongoing statistical evaluation of detection monitoring (i.e., Appendix III constituent) groundwater data associated with the Combined Waste Treatment Pond (CWTP) unit located at the Arizona Public Service (APS) Four Corners Power Plant (FCPP) in Fruitland, New Mexico.

Recent analysis of Appendix III constituent data collected from CWTP compliance wells in November 2018 declared statistically significant increases over respective Background Threshold Values (BTVs) for fluoride (at MW-62, MW-63, MW-64, and MW-65) and pH (at MW-64 and MW-65) and initial exceedances over BTVs for boron and calcium (at MW-62 and MW-63) on April 15, 2019 (Wood Environment & Infrastructure Solutions, Inc. [Wood], 2019a). An Alternative Source Demonstration (ASD) prepared thereafter (Wood, 2019b) concluded that the exceedances were not due to a release from the CWTP but were attributable to:

- The varying presence of fill materials at the compliance and background monitoring locations for fluoride;
- Surface-groundwater interactions for pH; and
- Spatial and temporal heterogeneity in the compliance and background well sample concentrations of boron and calcium.

The ASD recommended that various BTV updates, interwell comparisons, and intrawell comparisons be performed going forward depending on the constituent.

The statistical evaluation documented herein incorporates the results of detection monitoring at the CWTP in May 2019 and the recommendations presented in the ASD. The following sections present data inputs, statistical methods, results and recommendations for the subject analysis.

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2.0 DATA INPUTS

The CWTP groundwater monitoring well network consists of three background monitoring wells (MW-71, MW-72, and MW-73) and four compliance (i.e., downgradient), monitoring wells (M-62, M-63, MW-64 and M-65). The period of evaluation for this CWTP Appendix III constituent statistical analysis ranges from November 2015 through May 2019 and includes the minimum of eight initial, or baseline, sampling rounds required by the Coal Combustion Residuals (CCR) Rule and four subsequent sampling rounds of detection monitoring. Due principally to the CCR Rule requirement that a minimum of eight initial rounds of data be collected from the site prior to October 17, 2017, the frequency of sample collection prior to this date is short and variable (e.g., biweekly to quarterly sampling).

This data evaluation includes 19 to 21 sample results for boron, calcium, chloride, fluoride, sulfate, total dissolved solids (TDS), and pH at each compliance monitoring well and background wells MW-71 and MW-72; sample numbers vary due to constituent and well specific resampling efforts. Sample numbers range from 13 to 15 for background well MW-73 since monitoring at this well began later than other wells (i.e., February 2017). The first, second, third, and fourth rounds of detection monitoring at the CWTP were conducted in November 2017, June 2018, November 2018, and May 2019, respectively; all Appendix III constituents were evaluated in collected samples during these monitoring events with the exception of chloride and sulfate in May 2019 due the inadvertent exclusion of these analytes on the Chain of Custody in the field.

Appendix A contains the contents of the ProUCL data upload tables for the subject analysis. The Appendix III analytes are listed by name or chemical symbol as column headers in the ProUCL data upload table. By ProUCL convention (United States Environmental Protection Agency [USEPA], 2015), each analyte has a corresponding data column (indicated with a "D_" prefix) that indicates if the analyte was detected or not at a concentration that exceeds the analytical reporting limit, where detectable concentrations are symbolized by a "1" and non-detectable concentrations are symbolized by a "0." The detection frequency is 100% for all compliance well sample data listed in Appendix A.

3.0 METHODS

The statistical methods and analysis approach used to evaluate collected CWTP Appendix III constituent data are documented in the *Statistical Data Analysis Work Plan* (SDAWP) (Wood, 2018) prepared for the site. Using these methods and the referenced USEPA Unified Guidance (2009), new upper prediction limits (UPLs) for select constituents based on the recommendations of the ASD were calculated:

- A new boron BTV based on available data collected from background wells MW-71 and MW-72 for interwell comparison to data collected from compliance wells MW-64 and MW-65;
- A new boron BTV based on available data collected from background well MW-73 for interwell comparison to data collected from compliance wells MW-62 and MW-63;
- A new calcium BTV based on available data collected from background wells MW-71, MW-72, and MW-73 for interwell comparison to data collected from all compliance wells;
- New fluoride UPLs based on baseline data (November 2015 to October 2017) collected from each compliance well for intrawell analyses; and
- New pH UPLs based on baseline data (November 2015 to October 2017) collected from MW-64 and MW-65 for intrawell analyses.

The new UPLs and calculation methods are presented in Table 1.

Prior to comparing sample concentrations to corresponding BTVs or intrawell UPLs to assess whether a statistically significant increase over background is indicated, exploratory data analysis (EDA) including preparation of box plots, goodness of fit testing, Mann-Kendall trend testing, and outlier testing was performed.

4.0 RESULTS

Table 1 summarizes previously calculated BTVs (Wood, 2018b and Wood, 2018c) and the new BTVs and intrawell UPLs for each Appendix III constituent. Table 1 also identifies the type of resampling strategy in effect by constituent.

Table 2 summarizes: 1) which Appendix III constituents exhibit exceedances above their respective BTVs/intrawell UPL by compliance well and 2) which constituents exhibit statistically significant temporal trends.

Appendix B contains the raw ProUCL EDA outputs as reference for the following statistical findings:

Monitoring Well MW-62. As documented in previous statistical analyses reports (Wood, 2018b and Wood, 2018c), there have been past initial exceedances at this monitoring well identified for boron, calcium, and fluoride. The fluoride exceedance was declared in April 2019 (Wood, 2019a) and evaluated with an ASD. Using the newly calculated BTVs for boron and calcium as well as the new fluoride intrawell UPL, the only constituent that exceeded applicable criteria in May 2019 was calcium. Chloride and pH data collected through May 2019 at this well show statistically significant decreasing trends.

Monitoring Well MW-63. Like MW-62, past initial exceedances at MW-63 have been identified for boron, calcium, and fluoride (Wood, 2018b and Wood, 2018c). The fluoride exceedance was declared in April 2019 (Wood, 2019a) and evaluated with an ASD. Using the newly calculated BTVs for boron and calcium as well as the new fluoride intrawell UPL, the only constituent that exceeded applicable criteria in May 2019 was calcium. Based on an evaluation of MW-63 data collected through May 2019, calcium concentrations show a statistically significant increasing trend while chloride and pH values show a decreasing trend.

Monitoring Well MW-64. Initial exceedances at MW-64 have been identified for pH and fluoride (Wood, 2018b and Wood 2018c). Fluoride and pH exceedances were declared in April 2019 (Wood, 2019a) and evaluated with an ASD. Using the newly calculated BTVs for boron and calcium as well as the new fluoride and pH intrawell UPLs, there were no constituents that exceeded applicable criteria in May 2019. Sulfate showed a significant increasing trend at this well.

Monitoring Well MW-65. Like MW-64, initial exceedances at MW-65 have been identified for pH and fluoride (Wood, 2018b and Wood 2018c). Fluoride and pH exceedances were declared in April 2019 (Wood, 2019a) and evaluated with an ASD. Using the newly calculated BTVs for boron and calcium as well as the new fluoride and pH intrawell UPLs, there were no constituents that exceeded applicable criteria in May 2019. Based on an evaluation of MW-65 data collected through May 2019, boron, pH and TDS values have decreasing trends in this well.

5.0 CONCLUSIONS AND RECOMMENDATIONS

This statistical analysis results in the following conclusions and recommendations for the CWTP detection monitoring statistical analysis:

- There is sufficient evidence to declare initial exceedances for calcium at MW-62 and MW-63. Analysis of this exceedance using the 1 of 2 resampling strategy in place for calcium during the next scheduled Detection Monitoring event in November 2019 is recommended.
- It is notable that the newly calculated BTV for calcium (525 mg/L) is lower than the previously calculated BTV for calcium (540 mg/L) and that the calcium concentrations observed in May 2019 at both compliance wells were 540 mg/L. There is an increasing trend at MW-63 but no trend at MW-62. As the only constituent indicating this behavior, additional assessment of alternative sources for the calcium exceedance is suggested.
- Trend testing after each sampling round should continue to assess changes in temporal trend significance.
- Statistical method selection and background threshold values should be updated after 1-2 years of future sampling events.

6.0 REFERENCES

United States Environmental Protection Agency (U.S. EPA), 2009. *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance*. EPA 530/R-09-007. Environmental Protection Agency Office of Resource Conservation and Recovery.

U.S. EPA, 2015. *ProUCL (Version 5.1.1) User Guide, Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations*. EPA/600/R-07/041. Washington D.C. October 2015.

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Wood, 2018b. *Statistical Analysis of Initial Detection Monitoring Appendix III Constituent Data.* Arizona Public Service Four Corners Power Plant – Fruitland, New Mexico. Technical Memorandum dated January 12, 2018 and revised August 20, 2018.

Wood, 2018c. *CCR Groundwater Detection Monitoring Evaluation of June 2018 Data Collected from the CWTP.* Arizona Public Service Four Corners Power Plant – Fruitland, New Mexico. Technical Memorandum dated October 15, 2018.

Wood, 2019a. *CCR Groundwater Detection Monitoring Evaluation of November 2018 Data Collected from the CWTP*. Arizona Public Service Four Corners Power Plant – Fruitland, New Mexico. Technical Memorandum dated April 15, 2019.

Wood, 2019b. *Alternative Source Demonstration for Boron, Calcium, Fluoride and pH at the CWTP*. Arizona Public Service Four Corners Power Plant – Fruitland, New Mexico. Technical Memorandum dated July 15, 2019.

ATTACHMENTS

Table 1 – BTVs and Intrawell UPLs for the Four Corners CWTP
Table 2 – CWTP Downgradient Sample Data Summary

Appendix A – ProUCL Data Upload Table
Appendix B – ProUCL EDA Output Files

TABLES

Table 1
BTVs and Intrawell UPLs for the Four Corners CWTP
Appendix III Statistical Analysis

Background Wells	Dates Corresponding to Data Used to Derive UPL	Constituent	BTV (Calculation Method)	Units	Resampling Strategy[1]	Reference
MW-71 and MW-72	3/5/2016-5/6/2019	Boron	0.69 (NP-UPL)[2]	mg/L	1 of 3	*New BTV*
MW-73	2/2/2017-5/6/2019	Boron	2.0 (NP-UPL)[3]	mg/L	1 of 3	*New BTV*
MW-71, MW-72, and MW-73	3/5/2016-5/6/2019	Calcium	525 (P-UPL)	mg/L	1 of 2	*New BTV*
MW-71, MW-72, and MW-73	3/5/2016-10/13/2017	Chloride	710 (P-UPL)	mg/L	1 of 2	Wood, 2018b
MW-71, MW-72, and MW-73	3/5/2016-6/3/2018	pH (upper limit)	7.04 (P-UPL)[3]	SU	1 of 2	Wood, 2018c
MW-71, MW-72, and MW-73	3/5/2016-6/3/2018	pH (lower limit)	6.33 (P-LPL)	SU	1 of 2	Wood, 2018c
MW-71, MW-72, and MW-73	3/5/2016-10/13/2017	Sulfate	13,000 (NP-UPL)	mg/L	1 of 3	Wood, 2018b
MW-71, MW-72, and MW-73	3/5/2016-10/13/2017	TDS	20,000 (NP-UPL)	mg/L	1 of 3	Wood, 2018b

Compliance Well	Dates Corresponding to Data Used to Derive UPL	Constituent	Intrawell UPL (Calculation Method[1])	Units	Resampling Strategy[2]	Reference
MW-62	11/9/2015-10/13/2017	Fluoride	1.6 (NP-UPL)	mg/L	1 of 3	*New UPL*
MW-63	11/4/2015-10/13/2017	Fluoride	2.3 (P-UPL)	mg/L	1 of 3	*New UPL*
MW-64	11/5/2015-10/13/2017	Fluoride	1.5 (NP-UPL)	mg/L	1 of 3	*New UPL*
MW-64	11/5/2015-10/13/2017	pH	7.68 (P-UPL)	SU	1 of 2	*New UPL*
MW-64	11/5/2015-10/13/2017	pH	7.25 (P-LPL)	SU	1 of 2	*New UPL*
MW-65	11/5/2015-10/13/2017	Fluoride	2.0 (NP-UPL)	mg/L	1 of 3	*New UPL*
MW-65	11/5/2015-10/13/2017	pH	8.27 (NP-UPL)	SU	1 of 3	*New UPL*
MW-65	11/5/2015-10/13/2017	pH	6.96 (NP-LPL)	SU	1 of 3	*New UPL*

Notes:
BTV = background threshold value
CWTP = Combined Waste Treatment Pond
LPL = Lower Prediction Limit
mg/L = milligrams per liter
NP = Non Parametric
P = Parametric
SU = standard units
UPL = Upper Prediction Limit

[1] A 1 of 2 resampling strategy is in place for parametric prediction limits. A 1 of 3 resampling strategy is in place for non-parametric prediction limits and the limit represents the maximum concentration value of the data set (i.e., maximum order statistic).

[2] Only applicable to MW-64 and MW-65

[3] Only applicable to MW-62 and MW-63

Table 2
Four Corners CWTP Downgradient Sample Data Summary
Appendix III Statistical Analysis

Well	Sample_ID	SampDate	Constituent Concentration						
			Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS
MW-62	FC-CCR-MW62-110915	11/9/2015	*2.1*	*520*	*150*	*1.6*	*6.63*	*3600*	*6700*
MW-62	FC-CCR-MW-62-042716	4/27/2016	*2.0*	*530*	*150*	*1.6*	*6.77*	*3200*	*6100*
MW-62	FC-CCR-MW62-616	6/5/2016	*2.0*	*510*	*140*	*1.5*	*6.50*	*3300*	*5900*
MW-62	FC-CCR-MW62-816	8/20/2016	*2.3*	*530*	*120*	*1.5*	*7.40*	*3300*	*5800*
MW-62	FC-CCR-MW62-916	9/12/2016	*2.5*	*570*	*130*	*1.5*	*6.73*	*3300*	*2400*
MW-62	FC-CCR-MW62-1016	10/19/2016	*2.2*	*480*	*120*	*1.2*	*6.57*	*3300*	*6000*
MW-62	FC-CCR-MW62-117	2/1/2017	*2.1*	*510*	*110*	*1.4*	*6.68*	*3400*	*5600*
MW-62	FC-CCR-MW62-41617	4/16/2017	*1.9*	*500*	*120*	*1.2*	*6.64*	*3300*	*5900*
MW-62	FC-CCR-MW62-5117	5/1/2017	*1.9*	*520*	*110*	*3.3*	*6.64*	*3800*	*5800*
MW-62	FC-CCR-MW62-52917	5/29/2017	*1.9*	*570*	*120*	*1.2*	*6.50*	*3500*	*5500*
MW-62	FC-CCR-MW62-62117	6/21/2017	*1.9*	*520*	*120*	*1.4*	*6.54*	*3600*	*5700*
MW-62	FC-CCR-MW62-72117	7/21/2017	*2.1*	*540*	*99*	*1.5*	*6.69*	*3300*	*5400*
MW-62	FC-CCR-MW62-8917	8/9/2017	*2.2*	*540*	*110*	*1.4*	*6.41*	*3400*	*5400*
MW-62	FC-CCR-MW62-81617	8/16/2017	*2.1*	*590*	*110*	*1.6*	*6.36*	*3200*	*5400*
MW-62	FC-CCR-MW62-9917	9/9/2017	*2.3*	*570*	*120*	*1.5*	*6.41*	*3300*	*5500*
MW-62	FC-CCR-MW62-101317	10/13/2017	*2.2*	*520*	*130*	*1.5*	*6.46*	*3300*	*5600*
MW-62	FC-CCR-MW62-113017	11/30/2017	2.3	570	130	1.4	6.43	3400	5900
MW-62	FC-CCR-MW62-4618	4/6/2018	2.1	520	--	--	6.70	--	--
MW-62	FC-CCR-MW-62-6318	6/3/2018	1.8	490	120	1.6	6.59	3500	5900
MW-62	FC-CCR-MW62-11218	11/2/2018	2.4	550	110	1.5	6.46	3300	5600
MW-62	FC-CCR-MW62-5719-01	5/7/2019	1.8	**540**	--	1.4	6.65	--	5800
		Units:	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*SU*	*mg/L*	*mg/L*
		BTV or Intrawell UPL [1,2]:	***2.0***	***525***	*710*	***1.6***	*7.04/6.33*	*13,000*	*20,000*
		Temporal Trend [3]:	*None*	*None*	*Decreasing*	*None*	*Decreasing*	*None*	*None*

Table 2
Four Corners CWTP Downgradient Sample Data Summary
Appendix III Statistical Analysis

Well	Sample_ID	SampDate	Constituent Concentration						
			Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS
MW-63	FC-CCR-MW63-110415	11/4/2015	*1.6*	*420*	*77*	*2.4*	*6.86*	*2800*	*4100*
MW-63	FC-CCR-MW-63-042716	4/27/2016	*1.3*	*500*	*100*	*2.0*	*6.88*	*2300*	*4300*
MW-63	FC-CCR-MW63-616	6/5/2016	*1.4*	*500*	*110*	*1.9*	*6.70*	*2500*	*4400*
MW-63	FC-CCR-MW63-816	8/20/2016	*1.9*	*530*	*98*	*1.9*	*6.92*	*2800*	*4700*
MW-63	FC-CCR-MW63-916	9/12/2016	*2.0*	*550*	*110*	*2.1*	*7.03*	*2800*	*4700*
MW-63	FC-CCR-MW63-1016	10/19/2016	*1.7*	*470*	*100*	*1.8*	*6.82*	*2700*	*4500*
MW-63	FC-CCR-MW63-117	1/31/2017	*1.4*	*510*	*95*	*2.0*	*6.67*	*2600*	*4200*
MW-63	FC-CCR-MW63-41717	4/17/2017	*1.4*	*520*	*98*	*1.6*	*6.78*	*2600*	*4400*
MW-63	FC-CCR-MW63-5217	5/2/2017	*1.4*	*510*	*92*	*2.5*	*6.79*	*4300*	*4300*
MW-63	FC-CCR-MW63-52817	5/28/2017	*1.5*	*550*	*98*	*1.6*	*6.80*	*2700*	*4300*
MW-63	FC-CCR-MW63-62117	6/21/2017	*1.6*	*520*	*100*	*1.9*	*6.78*	*2900*	*4400*
MW-63	FC-CCR-MW63-72117	7/21/2017	*1.8*	*530*	*98*	*2.0*	*6.87*	*2900*	*4600*
MW-63	FC-CCR-MW63-8917	8/9/2017	*1.9*	*530*	*97*	*1.9*	*6.56*	*2900*	*4500*
MW-63	FC-CCR-MW63-81617	8/16/2017	*1.8*	*580*	*100*	*2.1*	*6.53*	*2700*	*4500*
MW-63	FC-CCR-MW63-9917	9/9/2017	*2.0*	*540*	*97*	*2.0*	*6.83*	*2700*	*4300*
MW-63	FC-CCR-MW63-101317	10/13/2017	*1.8*	*500*	*90*	*2.0*	*6.69*	*2700*	*4300*
MW-63	FC-CCR-MW63-113017	11/30/2017	1.7	560	91	1.8	6.72	2700	4500
MW-63	FC-CCR-MW63-4618	4/6/2018	1.3	530	--	--	6.75	--	--
MW-63	FC-CCR-MW-63-6318	6/3/2018	1.4	510	90	1.7	6.76	2600	4500
MW-63	FC-CCR-MW63-112818	11/2/2018	1.9	550	88	1.9	6.66	2800	4300
MW-63	FC-CCR-MW63-5719-02	5/7/2019	1.3	**540**	--	1.6	6.63	--	4400
		Units:	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*SU*	*mg/L*	*mg/L*
		BTV or Intrawell UPL [1,2]:	***2.0***	***525***	*710*	***2.3***	*7.04/6.33*	*13,000*	*20,000*
		Temporal Trend [3]:	*None*	*Increasing*	*Decreasing*	*None*	*Decreasing*	*None*	*None*

Table 2
Four Corners CWTP Downgradient Sample Data Summary
Appendix III Statistical Analysis

Well	Sample_ID	SampDate	Constituent Concentration						
			Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS
MW-64	FC-CCR-MW64-110515	11/5/2015	*0.64*	*87*	*49*	*1.5*	*7.64*	*320*	*780*
MW-64	FC-CCR-MW-64-042716	4/27/2016	*0.62*	*90*	*53*	*1.4*	*7.50*	*340*	*810*
MW-64	FC-CCR-MW64-616	6/5/2016	*0.58*	*86*	*52*	*1.4*	*7.29*	*350*	*800*
MW-64	FC-CCR-MW64-816	8/20/2016	*0.65*	*89*	*46*	*1.3*	*7.68*	*330*	*790*
MW-64	FC-CCR-MW64-916	9/12/2016	*0.67*	*90*	*52*	*1.5*	*7.54*	*320*	*790*
MW-64	FC-CCR-MW64-1016	10/19/2016	*0.64*	*83*	*53*	*1.5*	*7.52*	*330*	*790*
MW-64	FC-CCR-MW64-117	1/31/2017	*0.61*	*85*	*48*	*1.4*	*7.38*	*340*	*800*
MW-64	FC-CCR-MW64-41717	4/17/2017	*0.58*	*85*	*51*	*1.4*	*7.53*	*870*	*800*
MW-64	FC-CCR-MW64-5217	5/2/2017	*0.55*	*86*	*44*	*1.3*	*7.47*	*340*	*780*
MW-64	FC-CCR-MW64-52817	5/28/2017	*0.55*	*93*	*51*	*1.5*	*7.45*	*380*	*780*
MW-64	FC-CCR-MW64-62117	6/21/2017	*0.55*	*86*	*51*	*1.4*	*7.50*	*390*	*770*
MW-64	FC-CCR-MW64-72117	7/21/2017	*0.59*	*88*	*52*	*1.5*	*7.61*	*370*	*790*
MW-64	FC-CCR-MW64-8917	8/9/2017	*0.61*	*89*	*52*	*1.5*	*7.31*	*380*	*890*
MW-64	FC-CCR-MW64-81617	8/16/2017	*0.58*	*89*	*53*	*1.5*	*7.29*	*360*	*790*
MW-64	FC-CCR-MW64-9917	9/9/2017	*0.67*	*90*	*53*	*1.5*	*7.36*	*350*	*810*
MW-64	FC-CCR-MW64-101317	10/13/2017	*0.62*	*82*	*52*	*1.4*	*7.42*	*360*	*790*
MW-64	FC-CCR-MW64-113017	11/30/2017	0.64	90	52	1.4	7.37	350	780
MW-64	FC-CCR-MW-64-6318	6/3/2018	0.48	85	50	1.4	7.54	390	800
MW-64	FC-CCR-MW64-11218	11/2/2018	0.64	88	50	1.4	7.43	350	760
MW-64	FC-CCR-MW64-5719-03	5/7/2019	0.49	89	--	1.4	7.41	--	790
		Units:	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*SU*	*mg/L*	*mg/L*
		BTV or Intrawell UPL [1,2]:	***0.69***	***525***	*710*	***1.5***	***7.68/7.25***	*13,000*	*20,000*
		Temporal Trend [3]:	*None*	*None*	*None*	*None*	*None*	*Increasing*	*None*

Table 2
Four Corners CWTP Downgradient Sample Data Summary
Appendix III Statistical Analysis

Well	Sample_ID	SampDate	Constituent Concentration						
			Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS
MW-65	FC-CCR-MW65-110515	11/5/2015	*0.86*	*100*	*52*	*2.0*	*7.50*	*440*	*1000*
MW-65	FC-CCR-MW-65-042716	4/27/2016	*0.76*	*110*	*55*	*1.8*	*7.29*	*460*	*1100*
MW-65	FC-CCR-MW65-616	6/5/2016	*0.75*	*100*	*54*	*2.0*	*7.08*	*460*	*1100*
MW-65	FC-CCR-MW65-816	8/20/2016	*0.79*	*100*	*52*	*1.7*	*8.27*	*450*	*1000*
MW-65	FC-CCR-MW65-916	9/12/2016	*0.83*	*110*	*54*	*2.0*	*7.52*	*480*	*1100*
MW-65	FC-CCR-MW65-1016	10/19/2016	*0.77*	*95*	*54*	*2.0*	*7.36*	*450*	*1000*
MW-65	FC-CCR-MW65-117	2/1/2017	*0.76*	*96*	*51*	*1.8*	*7.35*	*410*	*970*
MW-65	FC-CCR-MW65-41617	4/16/2017	*0.83*	*120*	*60*	*1.8*	*7.21*	*490*	*1300*
MW-65	FC-CCR-MW65-5117	5/1/2017	*0.79*	*110*	*58*	*1.6*	*7.24*	*500*	*1100*
MW-65	FC-CCR-MW65-52917	5/29/2017	*0.98*	*160*	*77*	*1.8*	*7.10*	*790*	*1500*
MW-65	FC-CCR-MW65-62117	6/21/2017	*0.92*	*140*	*68*	*1.9*	*7.06*	*710*	*1400*
MW-65	FC-CCR-MW65-72117	7/21/2017	*0.76*	*110*	*53*	*2.0*	*7.31*	*470*	*1000*
MW-65	FC-CCR-MW65-8917	8/9/2017	*0.76*	*110*	*53*	*2.0*	*7.15*	*500*	*1000*
MW-65	FC-CCR-MW65-81617	8/16/2017	*0.75*	*110*	*53*	*2.0*	*6.96*	*500*	*1000*
MW-65	FC-CCR-MW65-9917	9/9/2017	*0.80*	*110*	*53*	*2.0*	*7.04*	*450*	*1000*
MW-65	FC-CCR-MW65-101317	10/13/2017	*0.75*	*92*	*52*	*1.9*	*7.13*	*400*	*960*
MW-65	FC-CCR-MW65-113017	11/30/2017	0.79	100	53	2.0	7.21	410	990
MW-65	FC-CCR-MW-65-6318	6/3/2018	0.62	98	52	1.9	7.22	480	1000
MW-65	FC-CCR-MW65-11218	11/2/2018	0.77	100	51	1.9	7.18	420	940
MW-65	FC-CCR-MW65-5719-05	5/7/2019	0.60	100	--	1.7	7.13	--	970
		Units:	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*SU*	*mg/L*	*mg/L*
		BTV or Intrawell UPL [1,2]:	***0.69***	***525***	*710*	***2.0***	***8.27/6.96***	*13,000*	*20,000*
		Temporal Trend [3]:	*Decreasing*	*None*	*None*	*None*	*Decreasing*	*None*	*Decreasing*

Table 2
Four Corners CWTP Downgradient Sample Data Summary
Appendix III Statistical Analysis

Well	Sample_ID	SampDate	Constituent Concentration						
			Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS

Notes:

BTV = background threshold value

mg/L = milligrams per liter

TDS = total dissolved solids

UPL = upper prediction limit

SU = standard units

0.75	Value from baseline monitoring period (November 2015 thru October 2017)
	Reported value in current sampling round (May 2019) exceeds the BTV or UPL
	Statistically significant increasing trend present
	Statistically significant decreasing trend present
None	Insufficient evidence to identify a trend

[1] New values calculated for this sampling round presented in bolded red text; see Table 1 for relevant BTV and Intrawell UPL information

[2] For pH, values presented refer to the Upper Prediction Limit/Lower Prediction Limit, respectively

[3] Temporal trends evaluated with Mann-Kendall trend tests ($p<0.05$); tied values (sequential sample concentrations

APPENDIX A

PROUCL DATA UPLOAD TABLE

Appendix A - PROUCL DATA UPLOAD TABLE

StationName	QC_SampleID	SampDate	NumDate	Boron	D_Boron	Calcium	D_Calcium	Chloride	D_Chloride	Fluoride	D_Fluoride	Sulfate	D_Sulfate	DissolvedSolids	D_DissolvedSolids	Field_pH	D_Field_pH
MW-62	FC-CCR-MW62-110915	11/9/2015 0:00	42317.00	2.1	1	520	1	150	1	1.6	1	3600	1	6700	1	6.63	1
MW-62	FC-CCR-MW-62-042716	4/27/2016 0:00	42487.00	2	1	530	1	150	1	1.6	1	3200	1	6100	1	6.77	1
MW-62	FC-CCR-MW62-616	6/5/2016 0:00	42526.00	2	1	510	1	140	1	1.5	1	3300	1	5900	1	6.50	1
MW-62	FC-CCR-MW62-816	8/20/2016 0:00	42602.00	2.3	1	530	1	120	1	1.5	1	3300	1	5800	1	7.40	1
MW-62	FC-CCR-MW62-916	9/12/2016 0:00	42625.00	2.5	1	570	1	130	1	1.5	1	3300	1	2400	1	6.73	1
MW-62	FC-CCR-MW62-1016	10/19/2016 0:00	42662.00	2.2	1	480	1	120	1	1.2	1	3300	1	6000	1	6.57	1
MW-62	FC-CCR-MW62-117	2/1/2017 0:00	42767.00	2.1	1	510	1	110	1	1.4	1	3400	1	5600	1	6.68	1
MW-62	FC-CCR-MW62-41617	4/16/2017 0:00	42841.00	1.9	1	500	1	120	1	1.2	1	3300	1	5900	1	6.64	1
MW-62	FC-CCR-MW62-5117	5/1/2017 0:00	42856.00	1.9	1	520	1	110	1	3.3	1	3800	1	5800	1	6.64	1
MW-62	FC-CCR-MW62-52917	5/29/2017 0:00	42884.00	1.9	1	570	1	120	1	1.2	1	3500	1	5500	1	6.50	1
MW-62	FC-CCR-MW62-62117	6/21/2017 0:00	42907.00	1.9	1	520	1	120	1	1.4	1	3600	1	5700	1	6.54	1
MW-62	FC-CCR-MW62-72117	7/21/2017 0:00	42937.00	2.1	1	540	1	99	1	1.5	1	3300	1	5400	1	6.69	1
MW-62	FC-CCR-MW62-8917	8/9/2017 0:00	42956.00	2.2	1	540	1	110	1	1.4	1	3400	1	5400	1	6.41	1
MW-62	FC-CCR-MW62-81617	8/16/2017 0:00	42963.00	2.1	1	590	1	110	1	1.6	1	3200	1	5400	1	6.36	1
MW-62	FC-CCR-MW62-9917	9/9/2017 0:00	42987.00	2.3	1	570	1	120	1	1.5	1	3300	1	5500	1	6.41	1
MW-62	FC-CCR-MW62-101317	10/13/2017 0:00	43021.00	2.2	1	520	1	130	1	1.5	1	3300	1	5600	1	6.46	1
MW-62	FC-CCR-MW62-113017	11/30/2017 0:00	43069.00	2.3	1	570	1	130	1	1.4	1	3400	1	5900	1	6.43	1
MW-62	FC-CCR-MW62-4618	4/6/2018 0:00	43196.00	2.1	1	520	1	--	--	--	--	--	--	--	--	6.70	1
MW-62	FC-CCR-MW-62-6318	6/3/2018 0:00	43254.00	1.8	1	490	1	120	1	1.6	1	3500	1	5900	1	6.59	1
MW-62	FC-CCR-MW62-11218	11/2/2018 0:00	43406.00	2.4	1	550	1	110	1	1.5	1	3300	1	5600	1	6.46	1
MW-62	FC-CCR-MW62-5719-01	5/7/2019 0:00	43592.00	1.8	1	540	1	--	--	1.4	1	--	--	5800	1	6.65	1
MW-63	FC-CCR-MW63-110415	11/4/2015 0:00	42312.00	1.6	1	420	1	77	1	2.4	1	2800	1	4100	1	6.86	1
MW-63	FC-CCR-MW-63-042716	4/27/2016 0:00	42487.00	1.3	1	500	1	100	1	2	1	2300	1	4300	1	6.88	1
MW-63	FC-CCR-MW63-616	6/5/2016 0:00	42526.00	1.4	1	500	1	110	1	1.9	1	2500	1	4400	1	6.70	1
MW-63	FC-CCR-MW63-816	8/20/2016 0:00	42602.00	1.9	1	530	1	98	1	1.9	1	2800	1	4700	1	6.92	1
MW-63	FC-CCR-MW63-916	9/12/2016 0:00	42625.00	2	1	550	1	110	1	2.1	1	2800	1	4700	1	7.03	1
MW-63	FC-CCR-MW63-1016	10/19/2016 0:00	42662.00	1.7	1	470	1	100	1	1.8	1	2700	1	4500	1	6.82	1
MW-63	FC-CCR-MW63-117	1/31/2017 0:00	42766.00	1.4	1	510	1	95	1	2	1	2600	1	4200	1	6.67	1
MW-63	FC-CCR-MW63-41717	4/17/2017 0:00	42842.00	1.4	1	520	1	98	1	1.6	1	2600	1	4400	1	6.78	1
MW-63	FC-CCR-MW63-5217	5/2/2017 0:00	42857.00	1.4	1	510	1	92	1	2.5	1	4300	1	4300	1	6.79	1
MW-63	FC-CCR-MW63-52817	5/28/2017 0:00	42883.00	1.5	1	550	1	98	1	1.6	1	2700	1	4300	1	6.80	1
MW-63	FC-CCR-MW63-62117	6/21/2017 0:00	42907.00	1.6	1	520	1	100	1	1.9	1	2900	1	4400	1	6.78	1
MW-63	FC-CCR-MW63-72117	7/21/2017 0:00	42937.00	1.8	1	530	1	98	1	2	1	2900	1	4600	1	6.87	1
MW-63	FC-CCR-MW63-8917	8/9/2017 0:00	42956.00	1.9	1	530	1	97	1	1.9	1	2900	1	4500	1	6.56	1
MW-63	FC-CCR-MW63-81617	8/16/2017 0:00	42963.00	1.8	1	580	1	100	1	2.1	1	2700	1	4500	1	6.53	1
MW-63	FC-CCR-MW63-9917	9/9/2017 0:00	42987.00	2	1	540	1	97	1	2	1	2700	1	4300	1	6.83	1
MW-63	FC-CCR-MW63-101317	10/13/2017 0:00	43021.00	1.8	1	500	1	90	1	2	1	2700	1	4300	1	6.69	1
MW-63	FC-CCR-MW63-113017	11/30/2017 0:00	43069.00	1.7	1	560	1	91	1	1.8	1	2700	1	4500	1	6.72	1
MW-63	FC-CCR-MW63-4618	4/6/2018 0:00	43196.00	1.3	1	530	1	--	--	--	--	--	--	--	--	6.75	1
MW-63	FC-CCR-MW-63-6318	6/3/2018 0:00	43254.00	1.4	1	510	1	90	1	1.7	1	2600	1	4500	1	6.76	1
MW-63	FC-CCR-MW63-112818	11/2/2018 0:00	43406.00	1.9	1	550	1	88	1	1.9	1	2800	1	4300	1	6.66	1
MW-63	FC-CCR-MW63-5719-02	5/7/2019 0:00	43592.00	1.3	1	540	1	--	--	1.6	1	--	--	4400	1	6.63	1
MW-64	FC-CCR-MW64-110515	11/5/2015 0:00	42313.00	0.64	1	87	1	49	1	1.5	1	320	1	780	1	7.64	1

Appendix A - PROUCL DATA UPLOAD TABLE

StationName	QC_SampleID	SampDate	NumDate	Boron	D_Boron	Calcium	D_Calcium	Chloride	D_Chloride	Fluoride	D_Fluoride	Sulfate	D_Sulfate	DissolvedSolids	D_DissolvedSolids	Field_pH	D_Field_pH
MW-64	FC-CCR-MW-64-042716	4/27/2016 0:00	42487.00	0.62	1	90	1	53	1	1.4	1	340	1	810	1	7.50	1
MW-64	FC-CCR-MW64-616	6/5/2016 0:00	42526.00	0.58	1	86	1	52	1	1.4	1	350	1	800	1	7.29	1
MW-64	FC-CCR-MW64-816	8/20/2016 0:00	42602.00	0.65	1	89	1	46	1	1.3	1	330	1	790	1	7.68	1
MW-64	FC-CCR-MW64-916	9/12/2016 0:00	42625.00	0.67	1	90	1	52	1	1.5	1	320	1	790	1	7.54	1
MW-64	FC-CCR-MW64-1016	10/19/2016 0:00	42662.00	0.64	1	83	1	53	1	1.5	1	330	1	790	1	7.52	1
MW-64	FC-CCR-MW64-117	1/31/2017 0:00	42766.00	0.61	1	85	1	48	1	1.4	1	340	1	800	1	7.38	1
MW-64	FC-CCR-MW64-41717	4/17/2017 0:00	42842.00	0.58	1	85	1	51	1	1.4	1	870	1	800	1	7.53	1
MW-64	FC-CCR-MW64-5217	5/2/2017 0:00	42857.00	0.55	1	86	1	44	1	1.3	1	340	1	780	1	7.47	1
MW-64	FC-CCR-MW64-52817	5/28/2017 0:00	42883.00	0.55	1	93	1	51	1	1.5	1	380	1	780	1	7.45	1
MW-64	FC-CCR-MW64-62117	6/21/2017 0:00	42907.00	0.55	1	86	1	51	1	1.4	1	390	1	770	1	7.50	1
MW-64	FC-CCR-MW64-72117	7/21/2017 0:00	42937.00	0.59	1	88	1	52	1	1.5	1	370	1	790	1	7.61	1
MW-64	FC-CCR-MW64-8917	8/9/2017 0:00	42956.00	0.61	1	89	1	52	1	1.5	1	380	1	890	1	7.31	1
MW-64	FC-CCR-MW64-81617	8/16/2017 0:00	42963.00	0.58	1	89	1	53	1	1.5	1	360	1	790	1	7.29	1
MW-64	FC-CCR-MW64-9917	9/9/2017 0:00	42987.00	0.67	1	90	1	53	1	1.5	1	350	1	810	1	7.36	1
MW-64	FC-CCR-MW64-101317	10/13/2017 0:00	43021.00	0.62	1	82	1	52	1	1.4	1	360	1	790	1	7.42	1
MW-64	FC-CCR-MW64-113017	11/30/2017 0:00	43069.00	0.64	1	90	1	52	1	1.4	1	350	1	780	1	7.37	1
MW-64	FC-CCR-MW-64-6318	6/3/2018 0:00	43254.00	0.48	1	85	1	50	1	1.4	1	390	1	800	1	7.54	1
MW-64	FC-CCR-MW64-11218	11/2/2018 0:00	43406.00	0.64	1	88	1	50	1	1.4	1	350	1	760	1	7.43	1
MW-64	FC-CCR-MW64-5719-03	5/7/2019 0:00	43592.00	0.49	1	89	1	--	--	1.4	1	--	--	790	1	7.41	1
MW-65	FC-CCR-MW65-110515	11/5/2015 0:00	42313.00	0.86	1	100	1	52	1	2	1	440	1	1000	1	7.50	1
MW-65	FC-CCR-MW-65-042716	4/27/2016 0:00	42487.00	0.76	1	110	1	55	1	1.8	1	460	1	1100	1	7.29	1
MW-65	FC-CCR-MW65-616	6/5/2016 0:00	42526.00	0.75	1	100	1	54	1	2	1	460	1	1100	1	7.08	1
MW-65	FC-CCR-MW65-816	8/20/2016 0:00	42602.00	0.79	1	100	1	52	1	1.7	1	450	1	1000	1	8.27	1
MW-65	FC-CCR-MW65-916	9/12/2016 0:00	42625.00	0.83	1	110	1	54	1	2	1	480	1	1100	1	7.52	1
MW-65	FC-CCR-MW65-1016	10/19/2016 0:00	42662.00	0.77	1	95	1	54	1	2	1	450	1	1000	1	7.36	1
MW-65	FC-CCR-MW65-117	2/1/2017 0:00	42767.00	0.76	1	96	1	51	1	1.8	1	410	1	970	1	7.35	1
MW-65	FC-CCR-MW65-41617	4/16/2017 0:00	42841.00	0.83	1	120	1	60	1	1.8	1	490	1	1300	1	7.21	1
MW-65	FC-CCR-MW65-5117	5/1/2017 0:00	42856.00	0.79	1	110	1	58	1	1.6	1	500	1	1100	1	7.24	1
MW-65	FC-CCR-MW65-52917	5/29/2017 0:00	42884.00	0.98	1	160	1	77	1	1.8	1	790	1	1500	1	7.10	1
MW-65	FC-CCR-MW65-62117	6/21/2017 0:00	42907.00	0.92	1	140	1	68	1	1.9	1	710	1	1400	1	7.06	1
MW-65	FC-CCR-MW65-72117	7/21/2017 0:00	42937.00	0.76	1	110	1	53	1	2	1	470	1	1000	1	7.31	1
MW-65	FC-CCR-MW65-8917	8/9/2017 0:00	42956.00	0.76	1	110	1	53	1	2	1	500	1	1000	1	7.15	1
MW-65	FC-CCR-MW65-81617	8/16/2017 0:00	42963.00	0.75	1	110	1	53	1	2	1	500	1	1000	1	6.96	1
MW-65	FC-CCR-MW65-9917	9/9/2017 0:00	42987.00	0.8	1	110	1	53	1	2	1	450	1	1000	1	7.04	1
MW-65	FC-CCR-MW65-101317	10/13/2017 0:00	43021.00	0.75	1	92	1	52	1	1.9	1	400	1	960	1	7.13	1
MW-65	FC-CCR-MW65-113017	11/30/2017 0:00	43069.00	0.79	1	100	1	53	1	2	1	410	1	990	1	7.21	1
MW-65	FC-CCR-MW-65-6318	6/3/2018 0:00	43254.00	0.62	1	98	1	52	1	1.9	1	480	1	1000	1	7.22	1
MW-65	FC-CCR-MW65-11218	11/2/2018 0:00	43406.00	0.77	1	100	1	51	1	1.9	1	420	1	940	1	7.18	1
MW-65	FC-CCR-MW65-5719-05	5/7/2019 0:00	43592.00	0.6	1	100	1	--	--	1.7	1	--	--	970	1	7.13	1
MW-71	FC-CCR-MW-71-030516	3/5/2016 0:00	42434.00	0.44	1	450	1	660	1	0.05	0	8500	1	13000	1	7.73	1
MW-71	FC-CCR-MW-71-042616	4/26/2016 0:00	42486.00	0.69	1	470	1	670	1	2	0	13000	1	21000	1	6.58	1
MW-71	FC-CCR-MW71-616	6/6/2016 0:00	42527.00	0.7	1	460	1	750	1	0.4	0	13000	1	20000	1	6.47	1
MW-71	FC-CCR-MW71-816	8/21/2016 0:00	42603.00	0.56	1	450	1	590	1	0.8	0	8400	1	14000	1	7.04	1

Appendix A - PROUCL DATA UPLOAD TABLE

StationName	QC_SampleID	SampDate	NumDate	Boron	D_Boron	Calcium	D_Calcium	Chloride	D_Chloride	Fluoride	D_Fluoride	Sulfate	D_Sulfate	DissolvedSolids	D_DissolvedSolids	Field_pH	D_Field_pH
MW-71	FC-CCR-MW71-916	9/12/2016 0:00	42625.00	0.58	1	460	1	570	1	0.4	0	9300	1	16000	1	6.86	1
MW-71	FC-CCR-MW71-1016	10/20/2016 0:00	42663.00	0.55	1	410	1	580	1	0.4	0	9100	1	15000	1	6.90	1
MW-71	FC-CCR-MW71-117	2/2/2017 0:00	42768.00	0.62	1	440	1	610	1	0.4	0	14000	1	17000	1	6.64	1
MW-71	FC-CCR-MW71-41717	4/17/2017 0:00	42842.00	0.52	1	400	1	550	1	2	0	9400	1	15000	1	6.81	1
MW-71	FC-CCR-MW71-5217	5/2/2017 0:00	42857.00	0.58	1	450	1	560	1	2	0	11000	1	15000	1	6.86	1
MW-71	FC-CCR-MW71-52917	5/29/2017 0:00	42884.00	0.58	1	460	1	580	1	2	0	9900	1	14000	1	6.76	1
MW-71	FC-CCR-MW71-62217	6/22/2017 0:00	42908.00	0.6	1	460	1	620	1	2	0	4600	1	17000	1	6.79	1
MW-71	FC-CCR-MW71-72117	7/21/2017 0:00	42937.00	0.55	1	450	1	590	1	2	0	10000	1	15000	1	7.00	1
MW-71	FC-CCR-MW71-81017	8/10/2017 0:00	42957.00	0.55	1	450	1	560	1	2	0	10000	1	15000	1	6.59	1
MW-71	FC-CCR-MW71-81717	8/17/2017 0:00	42964.00	0.56	1	480	1	570	1	2	0	9500	1	15000	1	6.62	1
MW-71	FC-CCR-MW71-91117	9/11/2017 0:00	42989.00	0.55	1	470	1	570	1	2	0	9900	1	15000	1	6.56	1
MW-71	FC-CCR-MW71-101317	10/13/2017 0:00	43021.00	0.54	1	420	1	570	1	2	0	10000	1	15000	1	6.79	1
MW-71	FC-CCR-MW71-113017	11/30/2017 0:00	43069.00	0.56	1	490	1	540	1	2	0	10000	1	15000	1	6.71	1
MW-71	FC-CCR-MW-71-6218	6/2/2018 0:00	43253.00	0.55	1	420	1	520	1	0.8	0	10000	1	15000	1	6.85	1
MW-71	FC-CCR-MW71-11318	11/3/2018 0:00	43407.00	0.56	1	470	1	520	1	0.8	0	11000	1	16000	1	6.81	1
MW-71	FC-CCR-MW71-031819	3/18/2019 0:00	43542.00	--	--	--	--	--	--	0.8	0	--	--	--	--	6.68	1
MW-71	FC-CCR-MW71-5719	5/6/2019 0:00	43591.00	0.5	1	400	1	--	--	0.8	0	--	--	16000	1	6.66	1
MW-72	FC-CCR-MW72-030716	3/7/2016 0:00	42436.00	0.16	1	480	1	490	1	0.05	0	12000	1	17000	1	7.71	1
MW-72	FC-CCR-MW-72-042616	4/26/2016 0:00	42486.00	0.22	1	470	1	430	1	2	0	11000	1	19000	1	6.87	1
MW-72	FC-CCR-MW72-616	6/6/2016 0:00	42527.00	0.25	1	570	1	530	1	0.4	0	4500	1	9500	1	6.56	1
MW-72	FC-CCR-MW72-816	8/21/2016 0:00	42603.00	0.23	1	450	1	440	1	0.4	0	10000	1	17000	1	6.72	1
MW-72	FC-CCR-MW72-916	9/13/2016 0:00	42626.00	0.24	1	470	1	450	1	0.4	0	10000	1	17000	1	6.17	1
MW-72	FC-CCR-MW72-1016	10/20/2016 0:00	42663.00	0.23	1	400	1	480	1	0.4	0	11000	1	17000	1	6.84	1
MW-72	FC-CCR-MW72-117	2/2/2017 0:00	42768.00	0.23	1	420	1	430	1	0.4	0	11000	1	16000	1	6.63	1
MW-72	FC-CCR-MW72-41717	4/17/2017 0:00	42842.00	0.2	1	440	1	450	1	2	0	610	1	17000	1	6.73	1
MW-72	FC-CCR-MW72-5217	5/2/2017 0:00	42857.00	0.25	1	430	1	450	1	2	0	11000	1	16000	1	6.83	1
MW-72	FC-CCR-MW72-52917	5/29/2017 0:00	42884.00	0.25	1	470	1	460	1	2	0	11000	1	15000	1	6.68	1
MW-72	FC-CCR-MW72-62217	6/22/2017 0:00	42908.00	0.23	1	450	1	450	1	2	0	11000	1	17000	1	6.65	1
MW-72	FC-CCR-MW72-72117	7/21/2017 0:00	42937.00	0.23	1	450	1	460	1	2	0	11000	1	17000	1	6.93	1
MW-72	FC-CCR-MW72-81017	8/10/2017 0:00	42957.00	0.21	1	450	1	460	1	2	0	11000	1	17000	1	6.47	1
MW-72	FC-CCR-MW72-81717	8/17/2017 0:00	42964.00	0.26	1	490	1	450	1	2	0	11000	1	17000	1	6.18	1
MW-72	FC-CCR-MW72-91017	9/10/2017 0:00	42988.00	0.21	1	470	1	460	1	2	0	11000	1	17000	1	6.61	1
MW-72	FC-CCR-MW72-101317	10/13/2017 0:00	43021.00	0.22	1	430	1	450	1	2	0	11000	1	16000	1	6.65	1
MW-72	FC-CCR-MW72-113017	11/30/2017 0:00	43069.00	0.22	1	500	1	450	1	2	0	10000	1	16000	1	6.63	1
MW-72	FC-CCR-MW-72-6218	6/2/2018 0:00	43253.00	0.21	1	410	1	450	1	0.8	0	11000	1	16000	1	6.75	1
MW-72	FC-CCR-MW72-11318	11/3/2018 0:00	43407.00	0.22	1	470	1	450	1	0.8	0	11000	1	16000	1	6.75	1
MW-72	FC-CCR-MW72-031719	3/17/2019 0:00	43541.00	--	--	--	--	--	--	0.8	0	--	--	--	--	6.68	1
MW-72	FC-CCR-MW72-5719	5/6/2019 0:00	43591.00	0.22	1	400	1	--	--	0.8	0	--	--	16000	1	6.85	1
MW-73	FC-CCR-MW73-117	2/2/2017 0:00	42768.00	1.6	1	480	1	380	1	0.4	0	5400	1	8800	1	6.65	1
MW-73	FC-CCR-MW73-41817	4/18/2017 0:00	42843.00	1.6	1	450	1	340	1	0.8	0	5700	1	9200	1	6.70	1
MW-73	FC-CCR-MW73-5217	5/2/2017 0:00	42857.00	1.6	1	470	1	570	1	0.8	0	6900	1	11000	1	6.70	1
MW-73	FC-CCR-MW73-52917	5/29/2017 0:00	42884.00	1.8	1	510	1	290	1	0.8	0	4300	1	6100	1	6.70	1
MW-73	FC-CCR-MW73-62217	6/22/2017 0:00	42908.00	1.6	1	490	1	450	1	0.8	0	6700	1	11000	1	6.74	1

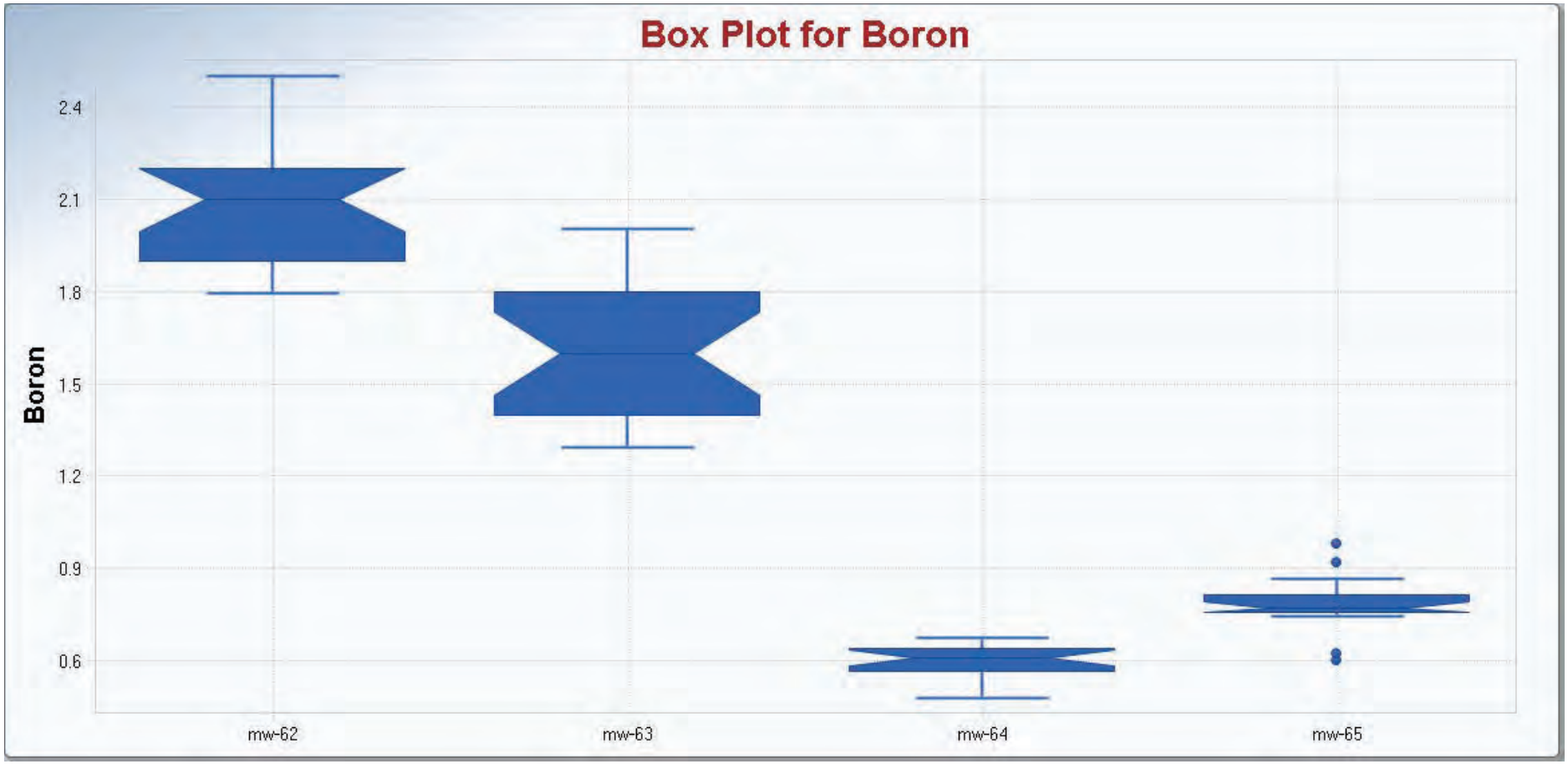
Appendix A - PROUCL DATA UPLOAD TABLE

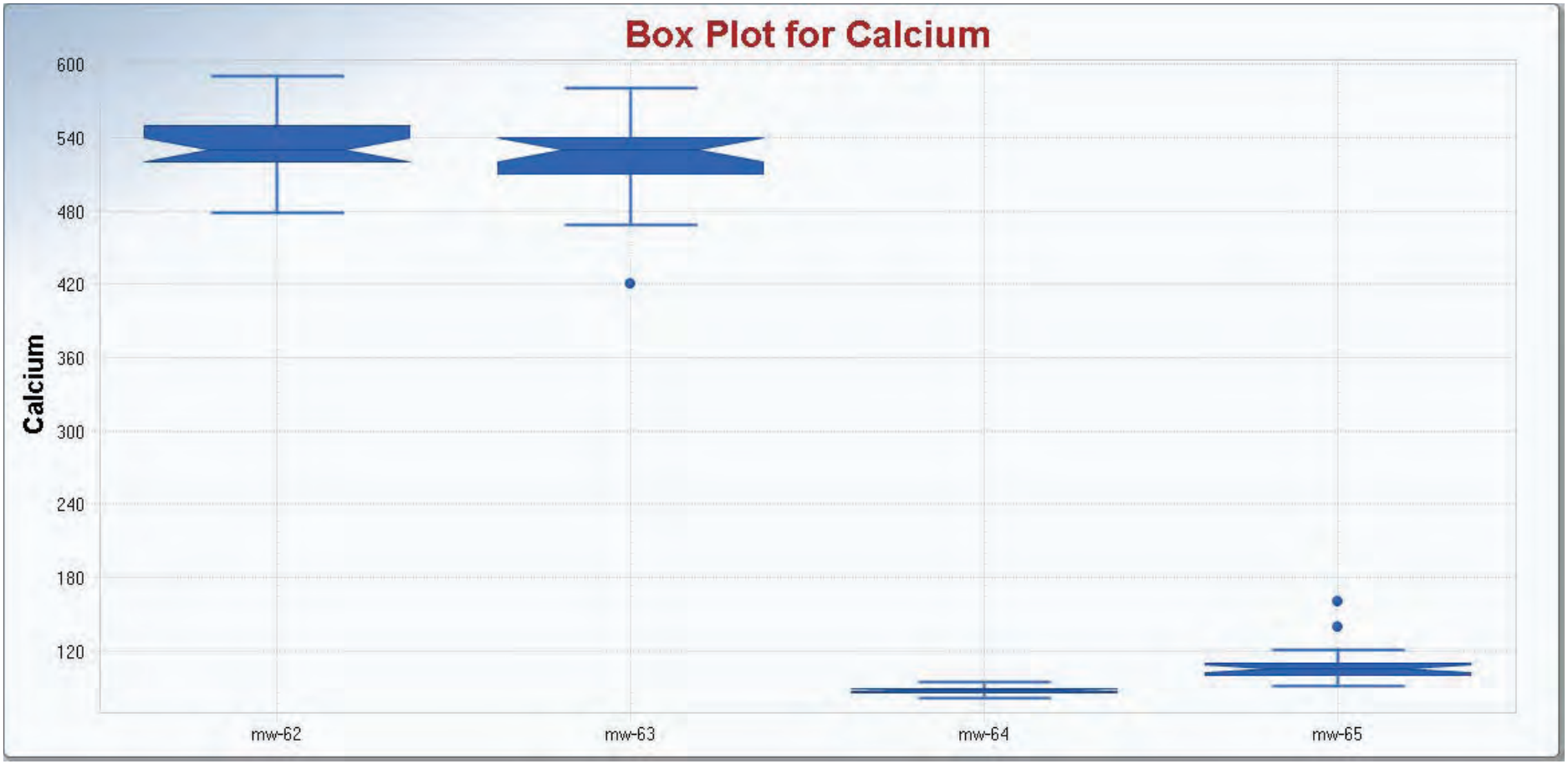
StationName	QC_SampleID	SampDate	NumDate	Boron	D_Boron	Calcium	D_Calcium	Chloride	D_Chloride	Fluoride	D_Fluoride	Sulfate	D_Sulfate	DissolvedSolids	D_DissolvedSolids	Field_pH	D_Field_pH
MW-73	FC-CCR-MW73-72217	7/22/2017 0:00	42938.00	1.6	1	490	1	520	1	0.8	0	8000	1	12000	1	6.83	1
MW-73	FC-CCR-MW73-81017	8/10/2017 0:00	42957.00	1.7	1	500	1	540	1	0.8	0	7700	1	12000	1	6.45	1
MW-73	FC-CCR-MW73-81717	8/17/2017 0:00	42964.00	1.7	1	540	1	550	1	0.8	0	7600	1	11000	1	6.50	1
MW-73	FC-CCR-MW73-91017	9/10/2017 0:00	42988.00	1.9	1	520	1	470	1	0.8	0	6000	1	9900	1	6.62	1
MW-73	FC-CCR-MW73-101217	10/12/2017 0:00	43020.00	2	1	510	1	310	1	0.8	0	3900	1	6600	1	6.64	1
MW-73	FC-CCR-MW73-113017	11/30/2017 0:00	43069.00	1.8	1	550	1	420	1	0.8	0	5600	1	8900	1	6.61	1
MW-73	FC-CCR-MW-73-6218	6/2/2018 0:00	43253.00	1.6	1	460	1	550	1	0.8	0	7100	1	12000	1	6.67	1
MW-73	FC-CCR-MW73-11318	11/3/2018 0:00	43407.00	1.7	1	480	1	660	1	0.8	0	7500	1	12000	1	6.64	1
MW-73	FC-CCR-MW73-031819	3/18/2019 0:00	43542.00	--	--	--	--	--	--	0.8	0	--	--	--	--	6.95	1
MW-73	FC-CCR-MW73-5619	5/6/2019 0:00	43591.00	1.6	1	420	1	--	--	0.8	0	--	--	13000	1	6.51	1

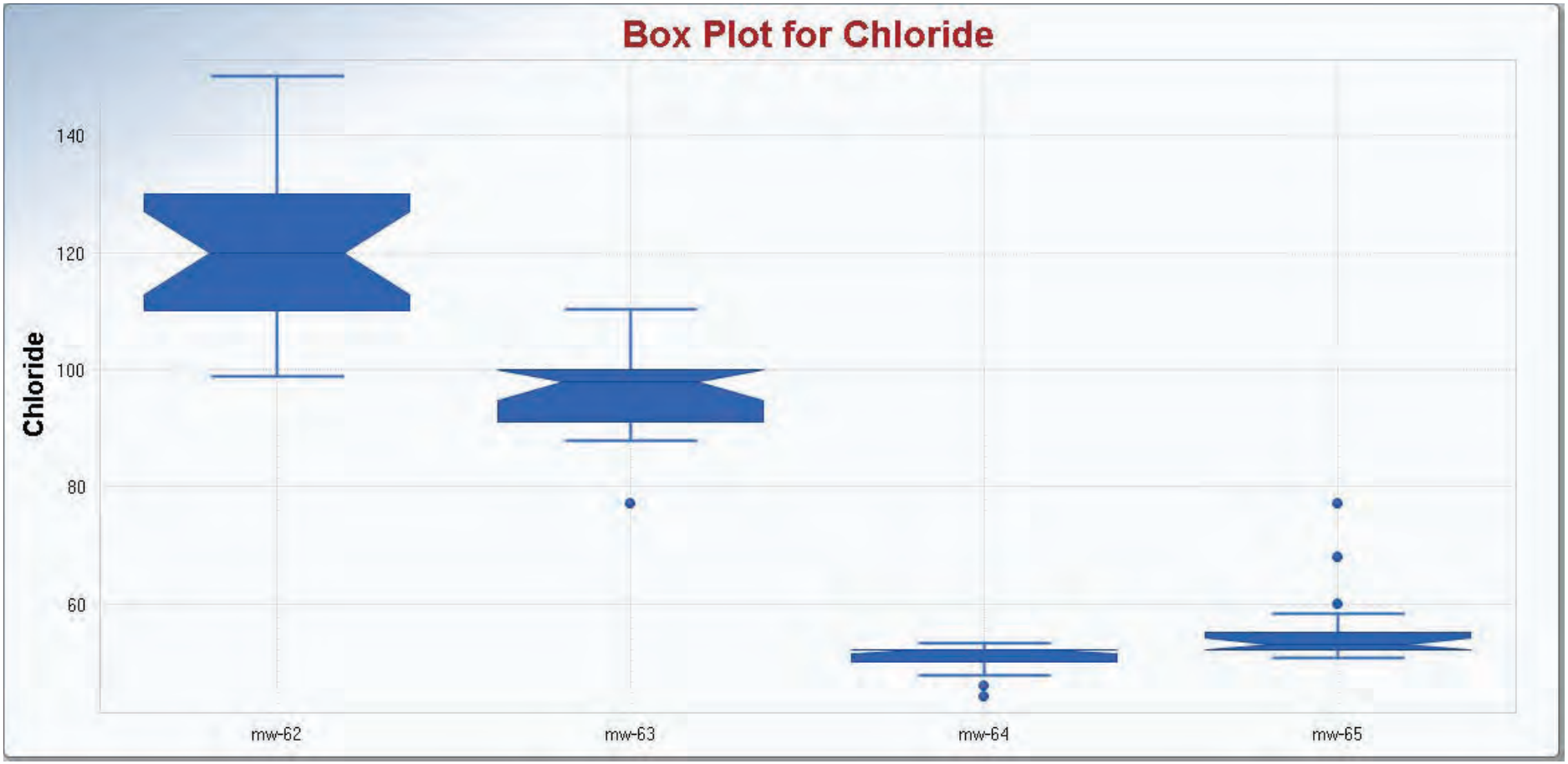
Yellow highlighted cells contain data that were assessed as the best quality during data validation; however, the values were replaced with more consistent reanalysis results during intial statistical assessments.

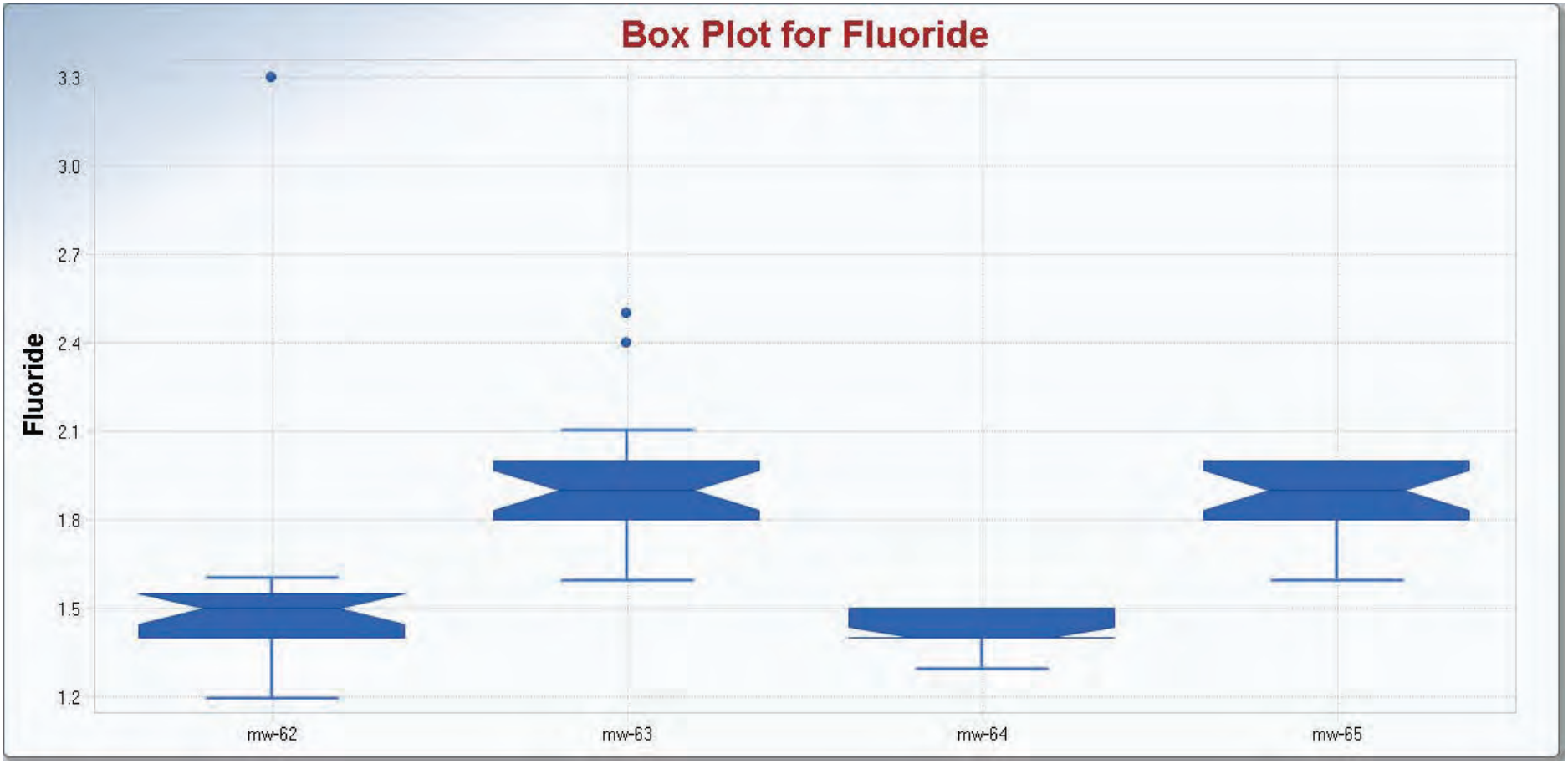
APPENDIX B

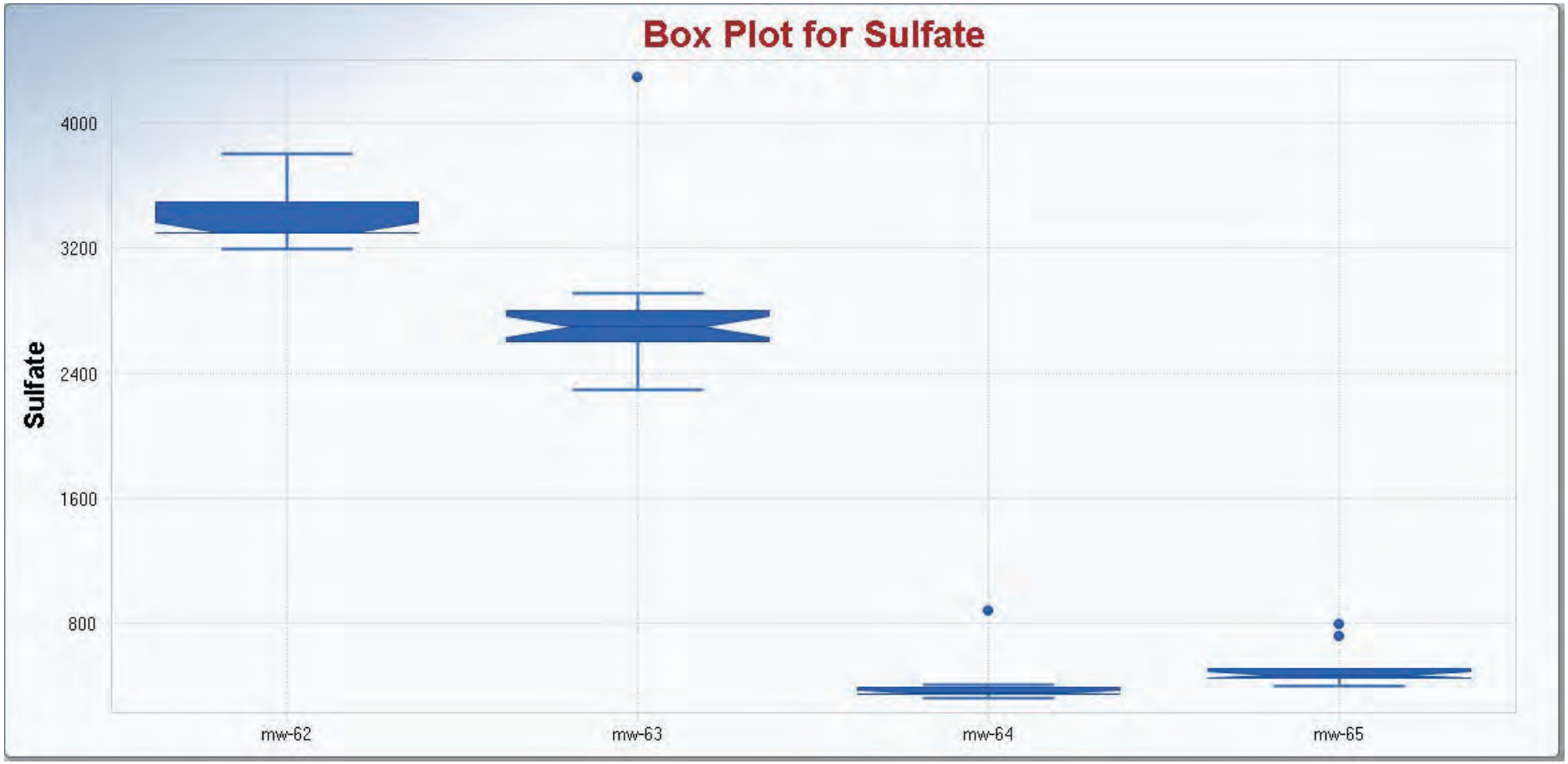
PROUCL EDA OUTPUT FILES

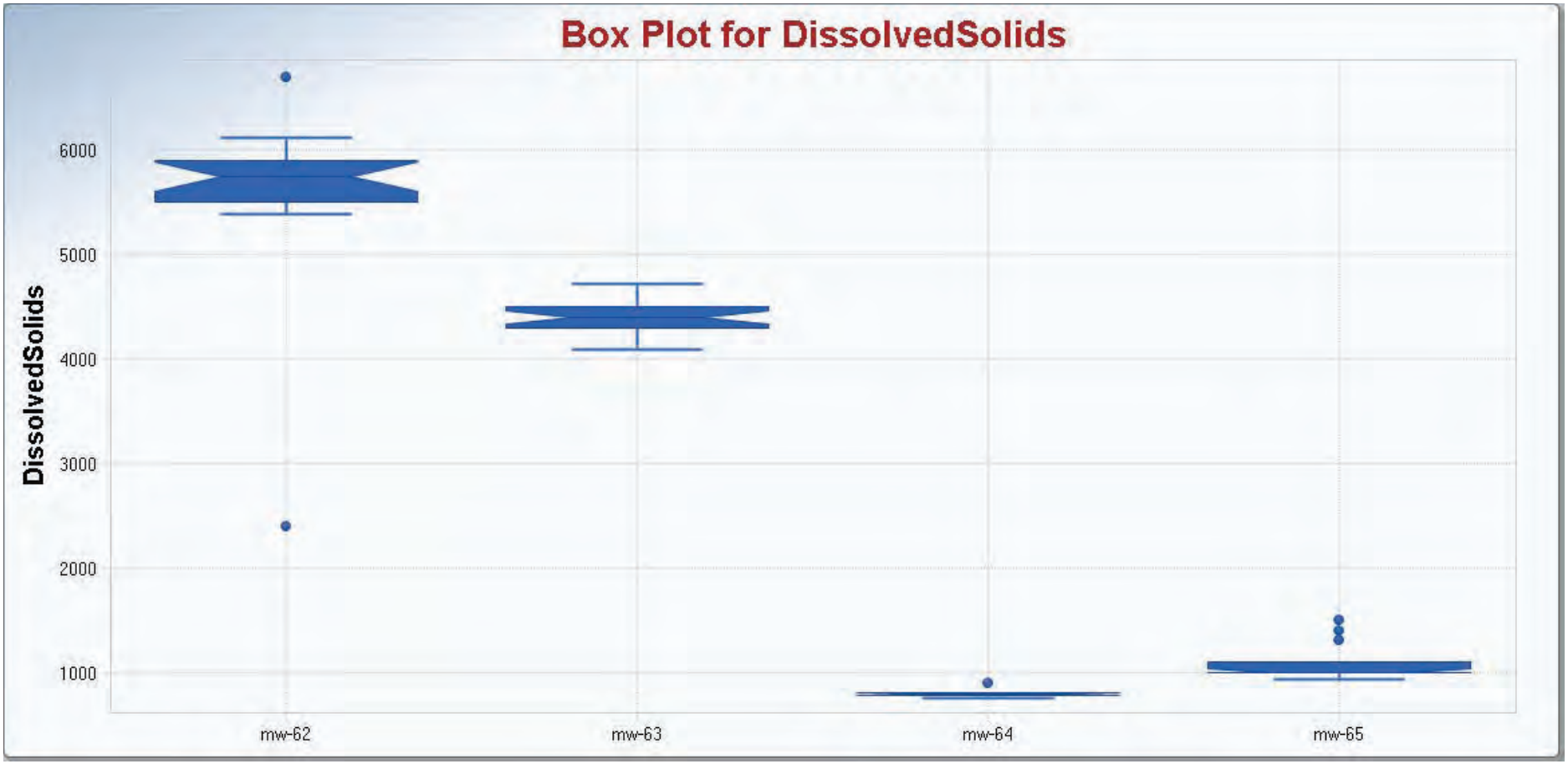

Box Plot for Boron
Boron
2.4
2.1
1.8
1.5
1.2
0.9
0.6
mw-62
mw-63
mw-64
mw-65

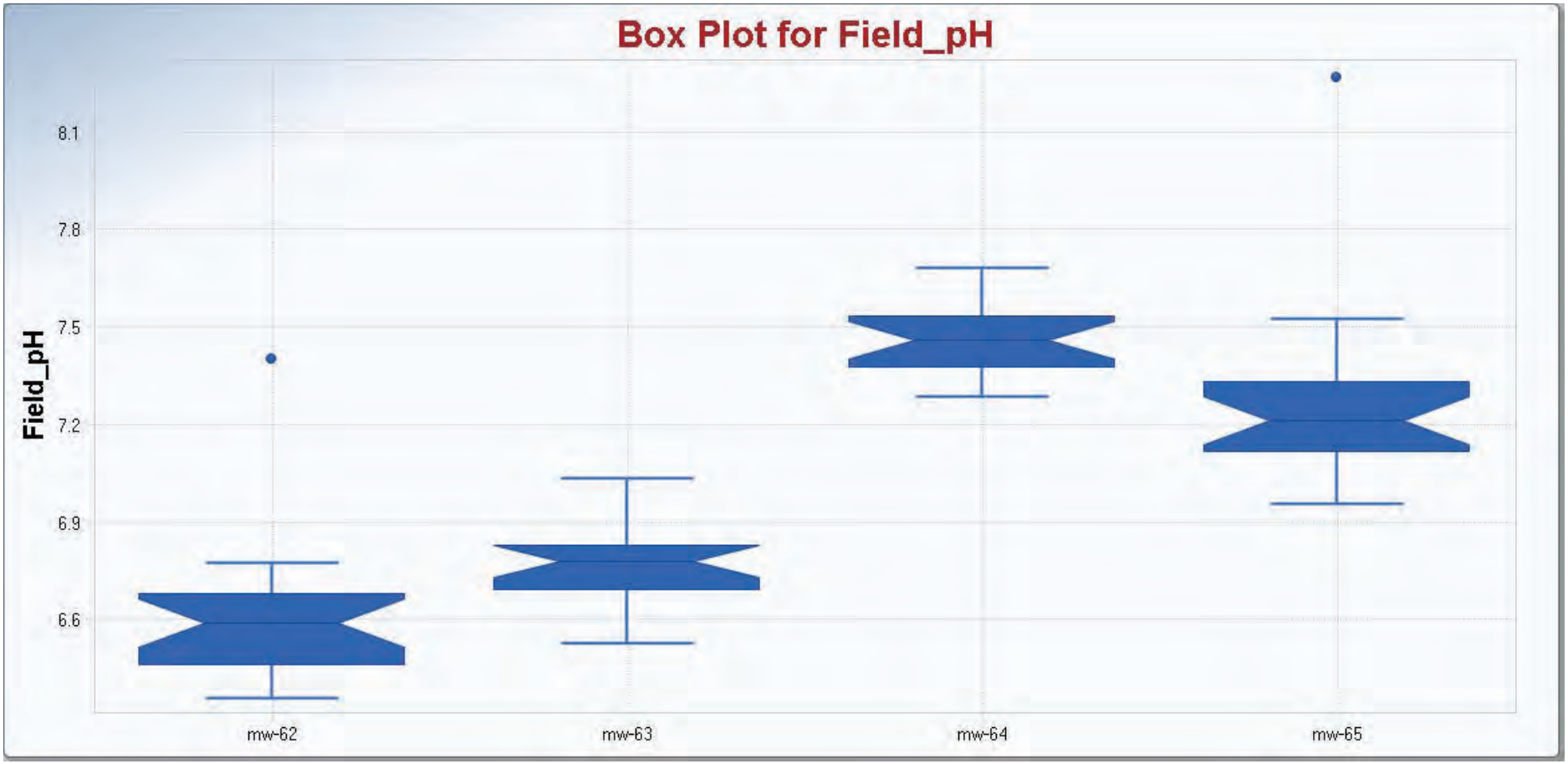

Box Plot for Calcium
Calcium
600
540
480
420
360
300
240
180
120
mw-62
mw-63
mw-64
mw-65


Box Plot for Chloride
Chloride
140
120
100
80
60
mw-62
mw-63
mw-64
mw-65


Box Plot for Fluoride
Fluoride
3.3
3.0
2.7
2.4
2.1
1.8
1.5
1.2
mw-62
mw-63
mw-64
mw-65


Box Plot for Sulfate
Sulfate
4000
3200
2400
1600
800
mw-62
mw-63
mw-64
mw-65


Box Plot for DissolvedSolids
DissolvedSolids
6000
5000
4000
3000
2000
1000
mw-62
mw-63
mw-64
mw-65


Box Plot for Field_pH
Field_pH
8.1
7.8
7.5
7.2
6.9
6.6
mw-62
mw-63
mw-64
mw-65

	Goodness-of-Fit Test Statistics for Data Sets with Non-Detects	
User Selected Options		
Date/Time of Computation	ProUCL 5.110/6/2019 11:38:19 AM	
From File	FCPP_CWTP_CCR_To20190531_AppxIII_Alt_ProUCL_ncl - nonBK Copy.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	

Boron (mw-62)

Raw Statistics	
Number of Valid Observations	21
Number of Distinct Observations	8
Minimum	1.8
Maximum	2.5
Mean of Raw Data	2.1
Standard Deviation of Raw Data	0.195
Khat	122.5
Theta hat	0.0171
Kstar	105
Theta star	0.02
Mean of Log Transformed Data	0.738
Standard Deviation of Log Transformed Data	0.0926

Normal GOF Test Results	
Correlation Coefficient R	0.983
Shapiro Wilk Test Statistic	0.958
Shapiro Wilk Critical (0.05) Value	0.908
Approximate Shapiro Wilk P Value	0.471
Lilliefors Test Statistic	0.133
Lilliefors Critical (0.05) Value	0.188

Data appear Normal at (0.05) Significance Level

Gamma GOF Test Results	
Correlation Coefficient R	0.984
A-D Test Statistic	0.382
A-D Critical (0.05) Value	0.74
K-S Test Statistic	0.141
K-S Critical(0.05) Value	0.189

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results	
Correlation Coefficient R	0.984
Shapiro Wilk Test Statistic	0.959
Shapiro Wilk Critical (0.05) Value	0.908
Approximate Shapiro Wilk P Value	0.491
Lilliefors Test Statistic	0.137
Lilliefors Critical (0.05) Value	0.188

Data appear Lognormal at (0.05) Significance Level

Boron (mw-63)

Raw Statistics	
Number of Valid Observations	21
Number of Distinct Observations	8
Minimum	1.3
Maximum	2
Mean of Raw Data	1.624
Standard Deviation of Raw Data	0.245
Khat	46.04
Theta hat	0.0353
Kstar	39.5
Theta star	0.0411
Mean of Log Transformed Data	0.474

68					Standard Deviation of Log Transformed Data	0.152						
69												
70					**Normal GOF Test Results**							
71												
72					Correlation Coefficient R	0.961						
73					Shapiro Wilk Test Statistic	0.903						
74					Shapiro Wilk Critical (0.05) Value	0.908						
75					Approximate Shapiro Wilk P Value	0.0383						
76					Lilliefors Test Statistic	0.201						
77					Lilliefors Critical (0.05) Value	0.188						
78	**Data not Normal at (0.05) Significance Level**											
79												
80					**Gamma GOF Test Results**							
81												
82					Correlation Coefficient R	0.959						
83					A-D Test Statistic	0.806						
84					A-D Critical (0.05) Value	0.741						
85					K-S Test Statistic	0.205						
86					K-S Critical(0.05) Value	0.189						
87	**Data not Gamma Distributed at (0.05) Significance Level**											
88												
89					**Lognormal GOF Test Results**							
90												
91					Correlation Coefficient R	0.96						
92					Shapiro Wilk Test Statistic	0.902						
93					Shapiro Wilk Critical (0.05) Value	0.908						
94					Approximate Shapiro Wilk P Value	0.0357						
95					Lilliefors Test Statistic	0.199						
96					Lilliefors Critical (0.05) Value	0.188						
97	**Data not Lognormal at (0.05) Significance Level**											
98												
99	**Non-parametric GOF Test Results**											
100												
101	**Data do not follow a discernible distribution at (0.05) Level of Sig**											
102												
103	**Boron (mw-64)**											
104												
105					**Raw Statistics**							
106					Number of Valid Observations	20						
107					Number of Distinct Observations	10						
108					Minimum	0.48						
109					Maximum	0.67						
110					Mean of Raw Data	0.598						
111					Standard Deviation of Raw Data	0.0538						
112					Khat	123.8						
113					Theta hat	0.00483						
114					Kstar	105.2						
115					Theta star	0.00568						
116					Mean of Log Transformed Data	-0.518						
117					Standard Deviation of Log Transformed Data	0.0935						
118												
119					**Normal GOF Test Results**							
120												
121					Correlation Coefficient R	0.966						
122					Shapiro Wilk Test Statistic	0.926						
123					Shapiro Wilk Critical (0.05) Value	0.905						
124					Approximate Shapiro Wilk P Value	0.143						
125					Lilliefors Test Statistic	0.138						
126					Lilliefors Critical (0.05) Value	0.192						
127	**Data appear Normal at (0.05) Significance Level**											
128												
129					**Gamma GOF Test Results**							
130												
131					Correlation Coefficient R	0.957						
132					A-D Test Statistic	0.593						
133					A-D Critical (0.05) Value	0.74						
134					K-S Test Statistic	0.149						

135					K-S Critical(0.05) Value	0.193						
136	**Data appear Gamma Distributed at (0.05) Significance Level**											
137												
138				**Lognormal GOF Test Results**								
139												
140					Correlation Coefficient R	0.955						
141					Shapiro Wilk Test Statistic	0.907						
142					Shapiro Wilk Critical (0.05) Value	0.905						
143					Approximate Shapiro Wilk P Value	0.0587						
144					Lilliefors Test Statistic	0.151						
145					Lilliefors Critical (0.05) Value	0.192						
146	**Data appear Lognormal at (0.05) Significance Level**											
147												
148	**Boron (mw-65)**											
149												
150				**Raw Statistics**								
151					Number of Valid Observations	20						
152					Number of Distinct Observations	11						
153					Minimum	0.6						
154					Maximum	0.98						
155					Mean of Raw Data	0.782						
156					Standard Deviation of Raw Data	0.084						
157					Khat	89.65						
158					Theta hat	0.00872						
159					Kstar	76.24						
160					Theta star	0.0103						
161					Mean of Log Transformed Data	-0.251						
162					Standard Deviation of Log Transformed Data	0.109						
163												
164				**Normal GOF Test Results**								
165												
166					Correlation Coefficient R	0.936						
167					Shapiro Wilk Test Statistic	0.895						
168					Shapiro Wilk Critical (0.05) Value	0.905						
169					Approximate Shapiro Wilk P Value	0.0286						
170					Lilliefors Test Statistic	0.252						
171					Lilliefors Critical (0.05) Value	0.192						
172	**Data not Normal at (0.05) Significance Level**											
173												
174				**Gamma GOF Test Results**								
175												
176					Correlation Coefficient R	0.941						
177					A-D Test Statistic	1.086						
178					A-D Critical (0.05) Value	0.74						
179					K-S Test Statistic	0.26						
180					K-S Critical(0.05) Value	0.193						
181	**Data not Gamma Distributed at (0.05) Significance Level**											
182												
183				**Lognormal GOF Test Results**								
184												
185					Correlation Coefficient R	0.93						
186					Shapiro Wilk Test Statistic	0.883						
187					Shapiro Wilk Critical (0.05) Value	0.905						
188					Approximate Shapiro Wilk P Value	0.017						
189					Lilliefors Test Statistic	0.27						
190					Lilliefors Critical (0.05) Value	0.192						
191	**Data not Lognormal at (0.05) Significance Level**											
192												
193	**Non-parametric GOF Test Results**											
194												
195	**Data do not follow a discernible distribution at (0.05) Level of Sig**											
196												
197	**Calcium (mw-62)**											
198												
199				**Raw Statistics**								
200					Number of Valid Observations	21						
201					Number of Distinct Observations	10						

Minimum	480	
Maximum	590	
Mean of Raw Data	532.9	
Standard Deviation of Raw Data	29.01	
Khat	356	
Theta hat	1.497	
Kstar	305.2	
Theta star	1.746	
Mean of Log Transformed Data	6.277	
Standard Deviation of Log Transformed Data	0.0543	

Normal GOF Test Results

Correlation Coefficient R	0.981
Shapiro Wilk Test Statistic	0.959
Shapiro Wilk Critical (0.05) Value	0.908
Approximate Shapiro Wilk P Value	0.489
Lilliefors Test Statistic	0.147
Lilliefors Critical (0.05) Value	0.188

Data appear Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.981
A-D Test Statistic	0.426
A-D Critical (0.05) Value	0.74
K-S Test Statistic	0.147
K-S Critical(0.05) Value	0.189

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.983
Shapiro Wilk Test Statistic	0.963
Shapiro Wilk Critical (0.05) Value	0.908
Approximate Shapiro Wilk P Value	0.558
Lilliefors Test Statistic	0.14
Lilliefors Critical (0.05) Value	0.188

Data appear Lognormal at (0.05) Significance Level

Calcium (mw-63)

Raw Statistics

Number of Valid Observations	21
Number of Distinct Observations	10
Minimum	420
Maximum	580
Mean of Raw Data	521.4
Standard Deviation of Raw Data	33.95
Khat	233.8
Theta hat	2.231
Kstar	200.4
Theta star	2.602
Mean of Log Transformed Data	6.254
Standard Deviation of Log Transformed Data	0.0681

Normal GOF Test Results

Correlation Coefficient R	0.946
Shapiro Wilk Test Statistic	0.912
Shapiro Wilk Critical (0.05) Value	0.908
Approximate Shapiro Wilk P Value	0.0565
Lilliefors Test Statistic	0.169
Lilliefors Critical (0.05) Value	0.188

Data appear Normal at (0.05) Significance Level

Gamma GOF Test Results

269												
270					Correlation Coefficient R	0.943						
271					A-D Test Statistic	0.665						
272					A-D Critical (0.05) Value	0.74						
273					K-S Test Statistic	0.174						
274					K-S Critical(0.05) Value	0.189						
275	**Data appear Gamma Distributed at (0.05) Significance Level**											
276												
277				**Lognormal GOF Test Results**								
278												
279					Correlation Coefficient R	0.929						
280					Shapiro Wilk Test Statistic	0.881						
281					Shapiro Wilk Critical (0.05) Value	0.908						
282					Approximate Shapiro Wilk P Value	0.0133						
283					Lilliefors Test Statistic	0.184						
284					Lilliefors Critical (0.05) Value	0.188						
285	**Data appear Approximate_Lognormal at (0.05) Significance Lev**											
286												
287	**Calcium (mw-64)**											
288												
289				**Raw Statistics**								
290					Number of Valid Observations	20						
291					Number of Distinct Observations	9						
292					Minimum	82						
293					Maximum	93						
294					Mean of Raw Data	87.5						
295					Standard Deviation of Raw Data	2.724						
296					Khat	1081						
297					Theta hat	0.081						
298					Kstar	918.6						
299					Theta star	0.0953						
300					Mean of Log Transformed Data	4.471						
301					Standard Deviation of Log Transformed Data	0.0313						
302												
303				**Normal GOF Test Results**								
304												
305					Correlation Coefficient R	0.978						
306					Shapiro Wilk Test Statistic	0.958						
307					Shapiro Wilk Critical (0.05) Value	0.905						
308					Approximate Shapiro Wilk P Value	0.527						
309					Lilliefors Test Statistic	0.159						
310					Lilliefors Critical (0.05) Value	0.192						
311	**Data appear Normal at (0.05) Significance Level**											
312												
313				**Gamma GOF Test Results**								
314												
315					Correlation Coefficient R	0.977						
316					A-D Test Statistic	0.453						
317					A-D Critical (0.05) Value	0.74						
318					K-S Test Statistic	0.166						
319					K-S Critical(0.05) Value	0.193						
320	**Data appear Gamma Distributed at (0.05) Significance Level**											
321												
322				**Lognormal GOF Test Results**								
323												
324					Correlation Coefficient R	0.977						
325					Shapiro Wilk Test Statistic	0.957						
326					Shapiro Wilk Critical (0.05) Value	0.905						
327					Approximate Shapiro Wilk P Value	0.495						
328					Lilliefors Test Statistic	0.162						
329					Lilliefors Critical (0.05) Value	0.192						
330	**Data appear Lognormal at (0.05) Significance Level**											
331												
332	**Calcium (mw-65)**											
333												
334				**Raw Statistics**								
335					Number of Valid Observations	20						

336					Number of Distinct Observations	9						
337					Minimum	92						
338					Maximum	160						
339					Mean of Raw Data	108.6						
340					Standard Deviation of Raw Data	16.14						
341					Khat	55.55						
342					Theta hat	1.954						
343					Kstar	47.25						
344					Theta star	2.297						
345					Mean of Log Transformed Data	4.678						
346					Standard Deviation of Log Transformed Data	0.133						
347												
348	**Normal GOF Test Results**											
349												
350					Correlation Coefficient R	0.852						
351					Shapiro Wilk Test Statistic	0.742						
352					Shapiro Wilk Critical (0.05) Value	0.905						
353					Approximate Shapiro Wilk P Value	5.3321E-5						
354					Lilliefors Test Statistic	0.314						
355					Lilliefors Critical (0.05) Value	0.192						
356	**Data not Normal at (0.05) Significance Level**											
357												
358	**Gamma GOF Test Results**											
359												
360					Correlation Coefficient R	0.878						
361					A-D Test Statistic	1.61						
362					A-D Critical (0.05) Value	0.74						
363					K-S Test Statistic	0.293						
364					K-S Critical(0.05) Value	0.193						
365	**Data not Gamma Distributed at (0.05) Significance Level**											
366												
367	**Lognormal GOF Test Results**											
368												
369					Correlation Coefficient R	0.887						
370					Shapiro Wilk Test Statistic	0.8						
371					Shapiro Wilk Critical (0.05) Value	0.905						
372					Approximate Shapiro Wilk P Value	5.0945E-4						
373					Lilliefors Test Statistic	0.283						
374					Lilliefors Critical (0.05) Value	0.192						
375	**Data not Lognormal at (0.05) Significance Level**											
376												
377	**Non-parametric GOF Test Results**											
378												
379	**Data do not follow a discernible distribution at (0.05) Level of Sig**											
380												
381	**Chloride (mw-62)**											
382												
383	**Raw Statistics**											
384					Number of Valid Observations	19						
385					Number of Missing Observations	2						
386					Number of Distinct Observations	6						
387					Minimum	99						
388					Maximum	150						
389					Mean of Raw Data	122.1						
390					Standard Deviation of Raw Data	13.66						
391					Khat	87.23						
392					Theta hat	1.399						
393					Kstar	73.49						
394					Theta star	1.661						
395					Mean of Log Transformed Data	4.799						
396					Standard Deviation of Log Transformed Data	0.109						
397												
398	**Normal GOF Test Results**											
399												
400					Correlation Coefficient R	0.95						
401					Shapiro Wilk Test Statistic	0.902						
402					Shapiro Wilk Critical (0.05) Value	0.901						

403					Approximate Shapiro Wilk P Value	0.0546						
404					Lilliefors Test Statistic	0.244						
405					Lilliefors Critical (0.05) Value	0.197						
406	**Data appear Approximate Normal at (0.05) Significance Level**											
407												
408					**Gamma GOF Test Results**							
409												
410					Correlation Coefficient R	0.957						
411					A-D Test Statistic	0.78						
412					A-D Critical (0.05) Value	0.739						
413					K-S Test Statistic	0.233						
414					K-S Critical(0.05) Value	0.198						
415	**Data not Gamma Distributed at (0.05) Significance Level**											
416												
417					**Lognormal GOF Test Results**							
418												
419					Correlation Coefficient R	0.959						
420					Shapiro Wilk Test Statistic	0.92						
421					Shapiro Wilk Critical (0.05) Value	0.901						
422					Approximate Shapiro Wilk P Value	0.118						
423					Lilliefors Test Statistic	0.225						
424					Lilliefors Critical (0.05) Value	0.197						
425	**Data appear Approximate_Lognormal at (0.05) Significance Lev**											
426												
427	**Chloride (mw-63)**											
428												
429					**Raw Statistics**							
430					Number of Valid Observations	19						
431					Number of Missing Observations	2						
432					Number of Distinct Observations	10						
433					Minimum	77						
434					Maximum	110						
435					Mean of Raw Data	96.26						
436					Standard Deviation of Raw Data	7.497						
437					Khat	168.6						
438					Theta hat	0.571						
439					Kstar	142						
440					Theta star	0.678						
441					Mean of Log Transformed Data	4.564						
442					Standard Deviation of Log Transformed Data	0.0799						
443												
444					**Normal GOF Test Results**							
445												
446					Correlation Coefficient R	0.95						
447					Shapiro Wilk Test Statistic	0.917						
448					Shapiro Wilk Critical (0.05) Value	0.901						
449					Approximate Shapiro Wilk P Value	0.0916						
450					Lilliefors Test Statistic	0.204						
451					Lilliefors Critical (0.05) Value	0.197						
452	**Data appear Approximate Normal at (0.05) Significance Level**											
453												
454					**Gamma GOF Test Results**							
455												
456					Correlation Coefficient R	0.949						
457					A-D Test Statistic	0.718						
458					A-D Critical (0.05) Value	0.738						
459					K-S Test Statistic	0.195						
460					K-S Critical(0.05) Value	0.198						
461	**Data appear Gamma Distributed at (0.05) Significance Level**											
462												
463					**Lognormal GOF Test Results**							
464												
465					Correlation Coefficient R	0.941						
466					Shapiro Wilk Test Statistic	0.903						
467					Shapiro Wilk Critical (0.05) Value	0.901						
468					Approximate Shapiro Wilk P Value	0.0486						
469					Lilliefors Test Statistic	0.198						

Lilliefors Critical (0.05) Value	0.197	
Data appear Approximate_Lognormal at (0.05) Significance Lev		
Chloride (mw-64)		
Raw Statistics		
Number of Valid Observations	19	
Number of Missing Observations	1	
Number of Distinct Observations	8	
Minimum	44	
Maximum	53	
Mean of Raw Data	50.74	
Standard Deviation of Raw Data	2.469	
Khat	424.5	
Theta hat	0.12	
Kstar	357.5	
Theta star	0.142	
Mean of Log Transformed Data	3.925	
Standard Deviation of Log Transformed Data	0.0505	
Normal GOF Test Results		
Correlation Coefficient R	0.902	
Shapiro Wilk Test Statistic	0.816	
Shapiro Wilk Critical (0.05) Value	0.901	
Approximate Shapiro Wilk P Value	0.00139	
Lilliefors Test Statistic	0.227	
Lilliefors Critical (0.05) Value	0.197	
Data not Normal at (0.05) Significance Level		
Gamma GOF Test Results		
Correlation Coefficient R	0.894	
A-D Test Statistic	1.353	
A-D Critical (0.05) Value	0.738	
K-S Test Statistic	0.233	
K-S Critical(0.05) Value	0.198	
Data not Gamma Distributed at (0.05) Significance Level		
Lognormal GOF Test Results		
Correlation Coefficient R	0.893	
Shapiro Wilk Test Statistic	0.801	
Shapiro Wilk Critical (0.05) Value	0.901	
Approximate Shapiro Wilk P Value	7.6100E-4	
Lilliefors Test Statistic	0.234	
Lilliefors Critical (0.05) Value	0.197	
Data not Lognormal at (0.05) Significance Level		
Non-parametric GOF Test Results		
Data do not follow a discernible distribution at (0.05) Level of Sig		
Chloride (mw-65)		
Raw Statistics		
Number of Valid Observations	19	
Number of Missing Observations	1	
Number of Distinct Observations	9	
Minimum	51	
Maximum	77	
Mean of Raw Data	55.53	
Standard Deviation of Raw Data	6.552	
Khat	88.28	
Theta hat	0.629	
Kstar	74.38	
Theta star	0.747	

537					Mean of Log Transformed Data	4.011						
538					Standard Deviation of Log Transformed Data	0.105						
539												
540					**Normal GOF Test Results**							
541												
542					Correlation Coefficient R	0.787						
543					Shapiro Wilk Test Statistic	0.637						
544					Shapiro Wilk Critical (0.05) Value	0.901						
545					Approximate Shapiro Wilk P Value	2.0604E-6						
546					Lilliefors Test Statistic	0.329						
547					Lilliefors Critical (0.05) Value	0.197						
548	**Data not Normal at (0.05) Significance Level**											
549												
550					**Gamma GOF Test Results**							
551												
552					Correlation Coefficient R	0.815						
553					A-D Test Statistic	2.568						
554					A-D Critical (0.05) Value	0.739						
555					K-S Test Statistic	0.326						
556					K-S Critical(0.05) Value	0.198						
557	**Data not Gamma Distributed at (0.05) Significance Level**											
558												
559					**Lognormal GOF Test Results**							
560												
561					Correlation Coefficient R	0.812						
562					Shapiro Wilk Test Statistic	0.673						
563					Shapiro Wilk Critical (0.05) Value	0.901						
564					Approximate Shapiro Wilk P Value	6.8573E-6						
565					Lilliefors Test Statistic	0.32						
566					Lilliefors Critical (0.05) Value	0.197						
567	**Data not Lognormal at (0.05) Significance Level**											
568												
569	**Non-parametric GOF Test Results**											
570												
571	**Data do not follow a discernible distribution at (0.05) Level of Sig**											
572												
573	**Fluoride (mw-62)**											
574												
575					**Raw Statistics**							
576					Number of Valid Observations	20						
577					Number of Missing Observations	1						
578					Number of Distinct Observations	5						
579					Minimum	1.2						
580					Maximum	3.3						
581					Mean of Raw Data	1.54						
582					Standard Deviation of Raw Data	0.433						
583					Khat	20.4						
584					Theta hat	0.0755						
585					Kstar	17.38						
586					Theta star	0.0886						
587					Mean of Log Transformed Data	0.407						
588					Standard Deviation of Log Transformed Data	0.207						
589												
590					**Normal GOF Test Results**							
591												
592					Correlation Coefficient R	0.681						
593					Shapiro Wilk Test Statistic	0.497						
594					Shapiro Wilk Critical (0.05) Value	0.905						
595					Approximate Shapiro Wilk P Value	1.5876E-8						
596					Lilliefors Test Statistic	0.395						
597					Lilliefors Critical (0.05) Value	0.192						
598	**Data not Normal at (0.05) Significance Level**											
599												
600					**Gamma GOF Test Results**							
601												
602					Correlation Coefficient R	0.727						
603					A-D Test Statistic	2.739						

604					A-D Critical (0.05) Value	0.741						
605					K-S Test Statistic	0.352						
606					K-S Critical(0.05) Value	0.193						
607	**Data not Gamma Distributed at (0.05) Significance Level**											
608												
609				**Lognormal GOF Test Results**								
610												
611					Correlation Coefficient R	0.776						
612					Shapiro Wilk Test Statistic	0.633						
613					Shapiro Wilk Critical (0.05) Value	0.905						
614					Approximate Shapiro Wilk P Value	1.0635E-6						
615					Lilliefors Test Statistic	0.33						
616					Lilliefors Critical (0.05) Value	0.192						
617	**Data not Lognormal at (0.05) Significance Level**											
618												
619	**Non-parametric GOF Test Results**											
620												
621	**Data do not follow a discernible distribution at (0.05) Level of Sig**											
622												
623	**Fluoride (mw-63)**											
624												
625				**Raw Statistics**								
626					Number of Valid Observations	20						
627					Number of Missing Observations	1						
628					Number of Distinct Observations	8						
629					Minimum	1.6						
630					Maximum	2.5						
631					Mean of Raw Data	1.935						
632					Standard Deviation of Raw Data	0.235						
633					Khat	74.08						
634					Theta hat	0.0261						
635					Kstar	63						
636					Theta star	0.0307						
637					Mean of Log Transformed Data	0.653						
638					Standard Deviation of Log Transformed Data	0.119						
639												
640				**Normal GOF Test Results**								
641												
642					Correlation Coefficient R	0.954						
643					Shapiro Wilk Test Statistic	0.912						
644					Shapiro Wilk Critical (0.05) Value	0.905						
645					Approximate Shapiro Wilk P Value	0.0705						
646					Lilliefors Test Statistic	0.191						
647					Lilliefors Critical (0.05) Value	0.192						
648	**Data appear Normal at (0.05) Significance Level**											
649												
650				**Gamma GOF Test Results**								
651												
652					Correlation Coefficient R	0.962						
653					A-D Test Statistic	0.606						
654					A-D Critical (0.05) Value	0.74						
655					K-S Test Statistic	0.173						
656					K-S Critical(0.05) Value	0.193						
657	**Data appear Gamma Distributed at (0.05) Significance Level**											
658												
659				**Lognormal GOF Test Results**								
660												
661					Correlation Coefficient R	0.964						
662					Shapiro Wilk Test Statistic	0.928						
663					Shapiro Wilk Critical (0.05) Value	0.905						
664					Approximate Shapiro Wilk P Value	0.149						
665					Lilliefors Test Statistic	0.169						
666					Lilliefors Critical (0.05) Value	0.192						
667	**Data appear Lognormal at (0.05) Significance Level**											
668												
669	**Fluoride (mw-64)**											
670												

	Raw Statistics	
	Number of Valid Observations	20
	Number of Distinct Observations	3
	Minimum	1.3
	Maximum	1.5
	Mean of Raw Data	1.43
	Standard Deviation of Raw Data	0.0657
	Khat	492.4
	Theta hat	0.0029
	Kstar	418.5
	Theta star	0.00342
	Mean of Log Transformed Data	0.357
	Standard Deviation of Log Transformed Data	0.0464
	Normal GOF Test Results	
	Correlation Coefficient R	0.889
	Shapiro Wilk Test Statistic	0.78
	Shapiro Wilk Critical (0.05) Value	0.905
	Approximate Shapiro Wilk P Value	2.6169E-4
	Lilliefors Test Statistic	0.276
	Lilliefors Critical (0.05) Value	0.192
Data not Normal at (0.05) Significance Level		
	Gamma GOF Test Results	
	Correlation Coefficient R	0.884
	A-D Test Statistic	2.069
	A-D Critical (0.05) Value	0.74
	K-S Test Statistic	0.275
	K-S Critical(0.05) Value	0.193
Data not Gamma Distributed at (0.05) Significance Level		
	Lognormal GOF Test Results	
	Correlation Coefficient R	0.888
	Shapiro Wilk Test Statistic	0.779
	Shapiro Wilk Critical (0.05) Value	0.905
	Approximate Shapiro Wilk P Value	2.5160E-4
	Lilliefors Test Statistic	0.268
	Lilliefors Critical (0.05) Value	0.192
Data not Lognormal at (0.05) Significance Level		
Non-parametric GOF Test Results		
Data do not follow a discernible distribution at (0.05) Level of Sig		
Fluoride (mw-65)		
	Raw Statistics	
	Number of Valid Observations	20
	Number of Distinct Observations	5
	Minimum	1.6
	Maximum	2
	Mean of Raw Data	1.89
	Standard Deviation of Raw Data	0.125
	Khat	230.6
	Theta hat	0.00819
	Kstar	196.1
	Theta star	0.00964
	Mean of Log Transformed Data	0.634
	Standard Deviation of Log Transformed Data	0.0683
	Normal GOF Test Results	
	Correlation Coefficient R	0.915
	Shapiro Wilk Test Statistic	0.827

738					Shapiro Wilk Critical (0.05) Value	0.905						
739					Approximate Shapiro Wilk P Value	0.00184						
740					Lilliefors Test Statistic	0.26						
741					Lilliefors Critical (0.05) Value	0.192						
742	**Data not Normal at (0.05) Significance Level**											
743												
744				**Gamma GOF Test Results**								
745												
746					Correlation Coefficient R	0.904						
747					A-D Test Statistic	1.427						
748					A-D Critical (0.05) Value	0.74						
749					K-S Test Statistic	0.263						
750					K-S Critical(0.05) Value	0.193						
751	**Data not Gamma Distributed at (0.05) Significance Level**											
752												
753				**Lognormal GOF Test Results**								
754												
755					Correlation Coefficient R	0.911						
756					Shapiro Wilk Test Statistic	0.822						
757					Shapiro Wilk Critical (0.05) Value	0.905						
758					Approximate Shapiro Wilk P Value	0.00149						
759					Lilliefors Test Statistic	0.255						
760					Lilliefors Critical (0.05) Value	0.192						
761	**Data not Lognormal at (0.05) Significance Level**											
762												
763	**Non-parametric GOF Test Results**											
764												
765	**Data do not follow a discernible distribution at (0.05) Level of Sig**											
766												
767	**Sulfate (mw-62)**											
768												
769				**Raw Statistics**								
770					Number of Valid Observations	19						
771					Number of Missing Observations	2						
772					Number of Distinct Observations	6						
773					Minimum	3200						
774					Maximum	3800						
775					Mean of Raw Data	3384						
776					Standard Deviation of Raw Data	153.7						
777					Khat	528.9						
778					Theta hat	6.399						
779					Kstar	445.4						
780					Theta star	7.598						
781					Mean of Log Transformed Data	8.126						
782					Standard Deviation of Log Transformed Data	0.0443						
783												
784				**Normal GOF Test Results**								
785												
786					Correlation Coefficient R	0.911						
787					Shapiro Wilk Test Statistic	0.837						
788					Shapiro Wilk Critical (0.05) Value	0.901						
789					Approximate Shapiro Wilk P Value	0.00323						
790					Lilliefors Test Statistic	0.287						
791					Lilliefors Critical (0.05) Value	0.197						
792	**Data not Normal at (0.05) Significance Level**											
793												
794				**Gamma GOF Test Results**								
795												
796					Correlation Coefficient R	0.919						
797					A-D Test Statistic	1.329						
798					A-D Critical (0.05) Value	0.738						
799					K-S Test Statistic	0.292						
800					K-S Critical(0.05) Value	0.198						
801	**Data not Gamma Distributed at (0.05) Significance Level**											
802												
803				**Lognormal GOF Test Results**								
804												

805					Correlation Coefficient R	0.918						
806					Shapiro Wilk Test Statistic	0.848						
807					Shapiro Wilk Critical (0.05) Value	0.901						
808					Approximate Shapiro Wilk P Value	0.00503						
809					Lilliefors Test Statistic	0.287						
810					Lilliefors Critical (0.05) Value	0.197						
811	**Data not Lognormal at (0.05) Significance Level**											
812												
813	**Non-parametric GOF Test Results**											
814												
815	**Data do not follow a discernible distribution at (0.05) Level of Sig**											
816												
817	**Sulfate (mw-63)**											
818												
819					**Raw Statistics**							
820					Number of Valid Observations	19						
821					Number of Missing Observations	2						
822					Number of Distinct Observations	7						
823					Minimum	2300						
824					Maximum	4300						
825					Mean of Raw Data	2789						
826					Standard Deviation of Raw Data	394.3						
827					Khat	65.8						
828					Theta hat	42.39						
829					Kstar	55.45						
830					Theta star	50.31						
831					Mean of Log Transformed Data	7.926						
832					Standard Deviation of Log Transformed Data	0.12						
833												
834					**Normal GOF Test Results**							
835												
836					Correlation Coefficient R	0.747						
837					Shapiro Wilk Test Statistic	0.595						
838					Shapiro Wilk Critical (0.05) Value	0.901						
839					Approximate Shapiro Wilk P Value	5.1381E-7						
840					Lilliefors Test Statistic	0.337						
841					Lilliefors Critical (0.05) Value	0.197						
842	**Data not Normal at (0.05) Significance Level**											
843												
844					**Gamma GOF Test Results**							
845												
846					Correlation Coefficient R	0.773						
847					A-D Test Statistic	2.228						
848					A-D Critical (0.05) Value	0.74						
849					K-S Test Statistic	0.307						
850					K-S Critical(0.05) Value	0.198						
851	**Data not Gamma Distributed at (0.05) Significance Level**											
852												
853					**Lognormal GOF Test Results**							
854												
855					Correlation Coefficient R	0.801						
856					Shapiro Wilk Test Statistic	0.681						
857					Shapiro Wilk Critical (0.05) Value	0.901						
858					Approximate Shapiro Wilk P Value	7.8284E-6						
859					Lilliefors Test Statistic	0.297						
860					Lilliefors Critical (0.05) Value	0.197						
861	**Data not Lognormal at (0.05) Significance Level**											
862												
863	**Non-parametric GOF Test Results**											
864												
865	**Data do not follow a discernible distribution at (0.05) Level of Sig**											
866												
867	**Sulfate (mw-64)**											
868												
869					**Raw Statistics**							
870					Number of Valid Observations	19						
871					Number of Missing Observations	1						

Number of Distinct Observations	9	
Minimum	320	
Maximum	870	
Mean of Raw Data	380	
Standard Deviation of Raw Data	120.6	
Khat	17.66	
Theta hat	21.52	
Kstar	14.91	
Theta star	25.49	
Mean of Log Transformed Data	5.912	
Standard Deviation of Log Transformed Data	0.216	

Normal GOF Test Results

Correlation Coefficient R	0.611
Shapiro Wilk Test Statistic	0.405
Shapiro Wilk Critical (0.05) Value	0.901
Approximate Shapiro Wilk P Value	2.5844E-9
Lilliefors Test Statistic	0.414
Lilliefors Critical (0.05) Value	0.197

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.671
A-D Test Statistic	3.612
A-D Critical (0.05) Value	0.74
K-S Test Statistic	0.372
K-S Critical(0.05) Value	0.198

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.689
Shapiro Wilk Test Statistic	0.506
Shapiro Wilk Critical (0.05) Value	0.901
Approximate Shapiro Wilk P Value	3.9488E-8
Lilliefors Test Statistic	0.348
Lilliefors Critical (0.05) Value	0.197

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Sig

Sulfate (mw-65)

Raw Statistics

Number of Valid Observations	19
Number of Missing Observations	1
Number of Distinct Observations	12
Minimum	400
Maximum	790
Mean of Raw Data	487.9
Standard Deviation of Raw Data	98.35
Khat	32.36
Theta hat	15.08
Kstar	27.29
Theta star	17.88
Mean of Log Transformed Data	6.175
Standard Deviation of Log Transformed Data	0.172

Normal GOF Test Results

Correlation Coefficient R	0.815
Shapiro Wilk Test Statistic	0.679
Shapiro Wilk Critical (0.05) Value	0.901

939	Approximate Shapiro Wilk P Value	8.2766E-6
940	Lilliefors Test Statistic	0.346
941	Lilliefors Critical (0.05) Value	0.197
942	**Data not Normal at (0.05) Significance Level**	
943		
944	**Gamma GOF Test Results**	
945		
946	Correlation Coefficient R	0.849
947	A-D Test Statistic	1.913
948	A-D Critical (0.05) Value	0.74
949	K-S Test Statistic	0.316
950	K-S Critical(0.05) Value	0.198
951	**Data not Gamma Distributed at (0.05) Significance Level**	
952		
953	**Lognormal GOF Test Results**	
954		
955	Correlation Coefficient R	0.862
956	Shapiro Wilk Test Statistic	0.755
957	Shapiro Wilk Critical (0.05) Value	0.901
958	Approximate Shapiro Wilk P Value	1.2353E-4
959	Lilliefors Test Statistic	0.303
960	Lilliefors Critical (0.05) Value	0.197
961	**Data not Lognormal at (0.05) Significance Level**	
962		
963	**Non-parametric GOF Test Results**	
964		
965	**Data do not follow a discernible distribution at (0.05) Level of Sig**	
966		
967	**DissolvedSolids (mw-62)**	
968		
969	**Raw Statistics**	
970	Number of Valid Observations	20
971	Number of Missing Observations	1
972	Number of Distinct Observations	10
973	Minimum	2400
974	Maximum	6700
975	Mean of Raw Data	5595
976	Standard Deviation of Raw Data	810.8
977	Khat	32.53
978	Theta hat	172
979	Kstar	27.68
980	Theta star	202.1
981	Mean of Log Transformed Data	8.614
982	Standard Deviation of Log Transformed Data	0.202
983		
984	**Normal GOF Test Results**	
985		
986	Correlation Coefficient R	0.736
987	Shapiro Wilk Test Statistic	0.581
988	Shapiro Wilk Critical (0.05) Value	0.905
989	Approximate Shapiro Wilk P Value	1.9727E-7
990	Lilliefors Test Statistic	0.355
991	Lilliefors Critical (0.05) Value	0.192
992	**Data not Normal at (0.05) Significance Level**	
993		
994	**Gamma GOF Test Results**	
995		
996	Correlation Coefficient R	0.714
997	A-D Test Statistic	3.585
998	A-D Critical (0.05) Value	0.74
999	K-S Test Statistic	0.393
1000	K-S Critical(0.05) Value	0.193
1001	**Data not Gamma Distributed at (0.05) Significance Level**	
1002		
1003	**Lognormal GOF Test Results**	
1004		
1005	Correlation Coefficient R	0.655

1006					Shapiro Wilk Test Statistic	0.466						
1007					Shapiro Wilk Critical (0.05) Value	0.905						
1008					Approximate Shapiro Wilk P Value	6.5093E-9						
1009					Lilliefors Test Statistic	0.411						
1010					Lilliefors Critical (0.05) Value	0.192						
1011	**Data not Lognormal at (0.05) Significance Level**											
1012												
1013	**Non-parametric GOF Test Results**											
1014												
1015	**Data do not follow a discernible distribution at (0.05) Level of Sig**											
1016												
1017	**DissolvedSolids (mw-63)**											
1018												
1019					**Raw Statistics**							
1020					Number of Valid Observations	20						
1021					Number of Missing Observations	1						
1022					Number of Distinct Observations	7						
1023					Minimum	4100						
1024					Maximum	4700						
1025					Mean of Raw Data	4410						
1026					Standard Deviation of Raw Data	155.3						
1027					Khat	851.5						
1028					Theta hat	5.179						
1029					Kstar	723.8						
1030					Theta star	6.092						
1031					Mean of Log Transformed Data	8.391						
1032					Standard Deviation of Log Transformed Data	0.0351						
1033												
1034					**Normal GOF Test Results**							
1035												
1036					Correlation Coefficient R	0.973						
1037					Shapiro Wilk Test Statistic	0.946						
1038					Shapiro Wilk Critical (0.05) Value	0.905						
1039					Approximate Shapiro Wilk P Value	0.319						
1040					Lilliefors Test Statistic	0.161						
1041					Lilliefors Critical (0.05) Value	0.192						
1042	**Data appear Normal at (0.05) Significance Level**											
1043												
1044					**Gamma GOF Test Results**							
1045												
1046					Correlation Coefficient R	0.974						
1047					A-D Test Statistic	0.536						
1048					A-D Critical (0.05) Value	0.74						
1049					K-S Test Statistic	0.165						
1050					K-S Critical(0.05) Value	0.193						
1051	**Data appear Gamma Distributed at (0.05) Significance Level**											
1052												
1053					**Lognormal GOF Test Results**							
1054												
1055					Correlation Coefficient R	0.973						
1056					Shapiro Wilk Test Statistic	0.948						
1057					Shapiro Wilk Critical (0.05) Value	0.905						
1058					Approximate Shapiro Wilk P Value	0.343						
1059					Lilliefors Test Statistic	0.159						
1060					Lilliefors Critical (0.05) Value	0.192						
1061	**Data appear Lognormal at (0.05) Significance Level**											
1062												
1063	**DissolvedSolids (mw-64)**											
1064												
1065					**Raw Statistics**							
1066					Number of Valid Observations	20						
1067					Number of Distinct Observations	7						
1068					Minimum	760						
1069					Maximum	890						
1070					Mean of Raw Data	794.5						
1071					Standard Deviation of Raw Data	25.64						
1072					Khat	1063						

1073					Theta hat	0.747						
1074					Kstar	903.7						
1075					Theta star	0.879						
1076					Mean of Log Transformed Data	6.677						
1077					Standard Deviation of Log Transformed Data	0.0311						
1078												
1079				**Normal GOF Test Results**								
1080												
1081					Correlation Coefficient R	0.815						
1082					Shapiro Wilk Test Statistic	0.697						
1083					Shapiro Wilk Critical (0.05) Value	0.905						
1084					Approximate Shapiro Wilk P Value	9.4544E-6						
1085					Lilliefors Test Statistic	0.265						
1086					Lilliefors Critical (0.05) Value	0.192						
1087	**Data not Normal at (0.05) Significance Level**											
1088												
1089				**Gamma GOF Test Results**								
1090												
1091					Correlation Coefficient R	0.825						
1092					A-D Test Statistic	1.785						
1093					A-D Critical (0.05) Value	0.74						
1094					K-S Test Statistic	0.257						
1095					K-S Critical(0.05) Value	0.193						
1096	**Data not Gamma Distributed at (0.05) Significance Level**											
1097												
1098				**Lognormal GOF Test Results**								
1099												
1100					Correlation Coefficient R	0.829						
1101					Shapiro Wilk Test Statistic	0.719						
1102					Shapiro Wilk Critical (0.05) Value	0.905						
1103					Approximate Shapiro Wilk P Value	2.1313E-5						
1104					Lilliefors Test Statistic	0.256						
1105					Lilliefors Critical (0.05) Value	0.192						
1106	**Data not Lognormal at (0.05) Significance Level**											
1107												
1108	**Non-parametric GOF Test Results**											
1109												
1110	**Data do not follow a discernible distribution at (0.05) Level of Sig**											
1111												
1112	**DissolvedSolids (mw-65)**											
1113												
1114				**Raw Statistics**								
1115					Number of Valid Observations	20						
1116					Number of Distinct Observations	9						
1117					Minimum	940						
1118					Maximum	1500						
1119					Mean of Raw Data	1072						
1120					Standard Deviation of Raw Data	153						
1121					Khat	59.23						
1122					Theta hat	18.09						
1123					Kstar	50.38						
1124					Theta star	21.27						
1125					Mean of Log Transformed Data	6.968						
1126					Standard Deviation of Log Transformed Data	0.129						
1127												
1128				**Normal GOF Test Results**								
1129												
1130					Correlation Coefficient R	0.836						
1131					Shapiro Wilk Test Statistic	0.705						
1132					Shapiro Wilk Critical (0.05) Value	0.905						
1133					Approximate Shapiro Wilk P Value	1.4153E-5						
1134					Lilliefors Test Statistic	0.33						
1135					Lilliefors Critical (0.05) Value	0.192						
1136	**Data not Normal at (0.05) Significance Level**											
1137												
1138				**Gamma GOF Test Results**								
1139												

Correlation Coefficient R	0.863	
A-D Test Statistic	2.357	
A-D Critical (0.05) Value	0.74	
K-S Test Statistic	0.335	
K-S Critical(0.05) Value	0.193	

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.857	
Shapiro Wilk Test Statistic	0.739	
Shapiro Wilk Critical (0.05) Value	0.905	
Approximate Shapiro Wilk P Value	4.9334E-5	
Lilliefors Test Statistic	0.331	
Lilliefors Critical (0.05) Value	0.192	

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Sig

Field_pH (mw-62)

Raw Statistics

Number of Valid Observations	21	
Number of Distinct Observations	17	
Minimum	6.36	
Maximum	7.4	
Mean of Raw Data	6.608	
Standard Deviation of Raw Data	0.217	
Khat	1023	
Theta hat	0.00646	
Kstar	877.3	
Theta star	0.00753	
Mean of Log Transformed Data	1.888	
Standard Deviation of Log Transformed Data	0.0317	

Normal GOF Test Results

Correlation Coefficient R	0.857	
Shapiro Wilk Test Statistic	0.757	
Shapiro Wilk Critical (0.05) Value	0.908	
Approximate Shapiro Wilk P Value	7.3675E-5	
Lilliefors Test Statistic	0.192	
Lilliefors Critical (0.05) Value	0.188	

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.865	
A-D Test Statistic	1.128	
A-D Critical (0.05) Value	0.74	
K-S Test Statistic	0.181	
K-S Critical(0.05) Value	0.189	

Data follow Appr. Gamma Distribution at (0.05) Significance Lev

Lognormal GOF Test Results

Correlation Coefficient R	0.87	
Shapiro Wilk Test Statistic	0.779	
Shapiro Wilk Critical (0.05) Value	0.908	
Approximate Shapiro Wilk P Value	1.7276E-4	
Lilliefors Test Statistic	0.182	
Lilliefors Critical (0.05) Value	0.188	

Data appear Approximate_Lognormal at (0.05) Significance Lev

Field_pH (mw-63)

	Raw Statistics	
	Number of Valid Observations	21
	Number of Distinct Observations	20
	Minimum	6.53
	Maximum	7.03
	Mean of Raw Data	6.763
	Standard Deviation of Raw Data	0.119
	Khat	3374
	Theta hat	0.002
	Kstar	2892
	Theta star	0.00234
	Mean of Log Transformed Data	1.911
	Standard Deviation of Log Transformed Data	0.0176
	Normal GOF Test Results	
	Correlation Coefficient R	0.993
	Shapiro Wilk Test Statistic	0.989
	Shapiro Wilk Critical (0.05) Value	0.908
	Approximate Shapiro Wilk P Value	0.991
	Lilliefors Test Statistic	0.0794
	Lilliefors Critical (0.05) Value	0.188
Data appear Normal at (0.05) Significance Level		
	Gamma GOF Test Results	
	Correlation Coefficient R	0.993
	A-D Test Statistic	0.121
	A-D Critical (0.05) Value	0.74
	K-S Test Statistic	0.0829
	K-S Critical(0.05) Value	0.189
Data appear Gamma Distributed at (0.05) Significance Level		
	Lognormal GOF Test Results	
	Correlation Coefficient R	0.993
	Shapiro Wilk Test Statistic	0.989
	Shapiro Wilk Critical (0.05) Value	0.908
	Approximate Shapiro Wilk P Value	0.991
	Lilliefors Test Statistic	0.0826
	Lilliefors Critical (0.05) Value	0.188
Data appear Lognormal at (0.05) Significance Level		
Field_pH (mw-64)		
	Raw Statistics	
	Number of Valid Observations	20
	Number of Distinct Observations	17
	Minimum	7.29
	Maximum	7.68
	Mean of Raw Data	7.462
	Standard Deviation of Raw Data	0.112
	Khat	4692
	Theta hat	0.00159
	Kstar	3988
	Theta star	0.00187
	Mean of Log Transformed Data	2.01
	Standard Deviation of Log Transformed Data	0.015
	Normal GOF Test Results	
	Correlation Coefficient R	0.99
	Shapiro Wilk Test Statistic	0.97
	Shapiro Wilk Critical (0.05) Value	0.905
	Approximate Shapiro Wilk P Value	0.778
	Lilliefors Test Statistic	0.0928

1274					Lilliefors Critical (0.05) Value	0.192						
1275	**Data appear Normal at (0.05) Significance Level**											
1276												
1277				**Gamma GOF Test Results**								
1278												
1279					Correlation Coefficient R	0.99						
1280					A-D Test Statistic	0.266						
1281					A-D Critical (0.05) Value	0.74						
1282					K-S Test Statistic	0.103						
1283					K-S Critical(0.05) Value	0.193						
1284	**Data appear Gamma Distributed at (0.05) Significance Level**											
1285												
1286				**Lognormal GOF Test Results**								
1287												
1288					Correlation Coefficient R	0.99						
1289					Shapiro Wilk Test Statistic	0.971						
1290					Shapiro Wilk Critical (0.05) Value	0.905						
1291					Approximate Shapiro Wilk P Value	0.786						
1292					Lilliefors Test Statistic	0.0915						
1293					Lilliefors Critical (0.05) Value	0.192						
1294	**Data appear Lognormal at (0.05) Significance Level**											
1295												
1296	**Field_pH (mw-65)**											
1297												
1298				**Raw Statistics**								
1299					Number of Valid Observations	20						
1300					Number of Distinct Observations	18						
1301					Minimum	6.96						
1302					Maximum	8.27						
1303					Mean of Raw Data	7.266						
1304					Standard Deviation of Raw Data	0.277						
1305					Khat	764.6						
1306					Theta hat	0.0095						
1307					Kstar	649.9						
1308					Theta star	0.0112						
1309					Mean of Log Transformed Data	1.982						
1310					Standard Deviation of Log Transformed Data	0.0366						
1311												
1312				**Normal GOF Test Results**								
1313												
1314					Correlation Coefficient R	0.842						
1315					Shapiro Wilk Test Statistic	0.734						
1316					Shapiro Wilk Critical (0.05) Value	0.905						
1317					Approximate Shapiro Wilk P Value	3.8278E-5						
1318					Lilliefors Test Statistic	0.217						
1319					Lilliefors Critical (0.05) Value	0.192						
1320	**Data not Normal at (0.05) Significance Level**											
1321												
1322				**Gamma GOF Test Results**								
1323												
1324					Correlation Coefficient R	0.852						
1325					A-D Test Statistic	1.384						
1326					A-D Critical (0.05) Value	0.74						
1327					K-S Test Statistic	0.206						
1328					K-S Critical(0.05) Value	0.193						
1329	**Data not Gamma Distributed at (0.05) Significance Level**											
1330												
1331				**Lognormal GOF Test Results**								
1332												
1333					Correlation Coefficient R	0.857						
1334					Shapiro Wilk Test Statistic	0.759						
1335					Shapiro Wilk Critical (0.05) Value	0.905						
1336					Approximate Shapiro Wilk P Value	9.7636E-5						
1337					Lilliefors Test Statistic	0.205						
1338					Lilliefors Critical (0.05) Value	0.192						
1339	**Data not Lognormal at (0.05) Significance Level**											
1340												

	A	B	C	D	E	F	G	H	I	J	K	L
1341	**Non-parametric GOF Test Results**											
1342												
1343	**Data do not follow a discernible distribution at (0.05) Level of Sig**											

Mann-Kendall Trend Test Analysis		
User Selected Options		
Date/Time of Computation	ProUCL 5.110/6/2019 11:29:01 AM	
From File	FCPP_CWTP_CCR_To20190531_AppxIII_Alt_ProUCL_ncl - nonBK Copy.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

Boron-mw-62

General Statistics	
Number of Events Reported (m)	21
Number of Missing Events	0
Number or Reported Events Used	21
Number Values Reported (n)	21
Minimum	1.8
Maximum	2.5
Mean	2.1
Geometric Mean	2.091
Median	2.1
Standard Deviation	0.195
Coefficient of Variation	0.0928

Mann-Kendall Test	
M-K Test Value (S)	-2
Tabulated p-value	0.488
Standard Deviation of S	32.59
Standardized Value of S	-0.0307
Approximate p-value	0.488

Insufficient evidence to identify a significant trend at the specified level of significance.

Boron-mw-63

General Statistics	
Number of Events Reported (m)	21
Number of Missing Events	0
Number or Reported Events Used	21
Number Values Reported (n)	21
Minimum	1.3
Maximum	2
Mean	1.624
Geometric Mean	1.606
Median	1.6
Standard Deviation	0.245
Coefficient of Variation	0.151

Mann-Kendall Test	
M-K Test Value (S)	12
Tabulated p-value	0.371
Standard Deviation of S	32.65
Standardized Value of S	0.337
Approximate p-value	0.368

Insufficient evidence to identify a significant trend at the specified level of significance.

Boron-mw-64

General Statistics	
Number of Events Reported (m)	20
Number of Missing Events	0
Number or Reported Events Used	20
Number Values Reported (n)	20
Minimum	0.48
Maximum	0.67
Mean	0.598
Geometric Mean	0.596

Median	0.61				
Standard Deviation	0.0538				
Coefficient of Variation	0.0899				
Mann-Kendall Test					
M-K Test Value (S)	-35				
Tabulated p-value	0.144				
Standard Deviation of S	30.51				
Standardized Value of S	-1.114				
Approximate p-value	0.133				
Insufficient evidence to identify a significant					
trend at the specified level of significance.					
Boron-mw-65					
General Statistics					
Number of Events Reported (m)	20				
Number of Missing Events	0				
Number or Reported Events Used	20				
Number Values Reported (n)	20				
Minimum	0.6				
Maximum	0.98				
Mean	0.782				
Geometric Mean	0.778				
Median	0.77				
Standard Deviation	0.084				
Coefficient of Variation	0.107				
Mann-Kendall Test					
M-K Test Value (S)	-52				
Tabulated p-value	0.049				
Standard Deviation of S	30.53				
Standardized Value of S	-1.671				
Approximate p-value	0.0474				
Statistically significant evidence of a decreasing					
trend at the specified level of significance.					

Mann-Kendall Trend Test Analysis		
User Selected Options		
Date/Time of Computation	ProUCL 5.110/6/2019 11:29:58 AM	
From File	FCPP_CWTP_CCR_To20190531_AppxIII_Alt_ProUCL_ncl - nonBK Copy.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

Calcium-mw-62

General Statistics	
Number of Events Reported (m)	21
Number of Missing Events	0
Number or Reported Events Used	21
Number Values Reported (n)	21
Minimum	480
Maximum	590
Mean	532.9
Geometric Mean	532.1
Median	530
Standard Deviation	29.01
Coefficient of Variation	0.0544

Mann-Kendall Test	
M-K Test Value (S)	39
Tabulated p-value	0.134
Standard Deviation of S	32.64
Standardized Value of S	1.164
Approximate p-value	0.122

Insufficient evidence to identify a significant trend at the specified level of significance.

Calcium-mw-63

General Statistics	
Number of Events Reported (m)	21
Number of Missing Events	0
Number or Reported Events Used	21
Number Values Reported (n)	21
Minimum	420
Maximum	580
Mean	521.4
Geometric Mean	520.3
Median	530
Standard Deviation	33.95
Coefficient of Variation	0.0651

Mann-Kendall Test	
M-K Test Value (S)	81
Tabulated p-value	0.008
Standard Deviation of S	32.79
Standardized Value of S	2.44
Approximate p-value	0.00734

Statistically significant evidence of an increasing trend at the specified level of significance.

Calcium-mw-64

General Statistics	
Number of Events Reported (m)	20
Number of Missing Events	0
Number or Reported Events Used	20
Number Values Reported (n)	20
Minimum	82
Maximum	93
Mean	87.5
Geometric Mean	87.46

Median	88				
Standard Deviation	2.724				
Coefficient of Variation	0.0311				
Mann-Kendall Test					
M-K Test Value (S)	11				
Tabulated p-value	0.387				
Standard Deviation of S	30.4				
Standardized Value of S	0.329				
Approximate p-value	0.371				
Insufficient evidence to identify a significant					
trend at the specified level of significance.					
Calcium-mw-65					
General Statistics					
Number of Events Reported (m)	20				
Number of Missing Events	0				
Number or Reported Events Used	20				
Number Values Reported (n)	20				
Minimum	92				
Maximum	160				
Mean	108.6				
Geometric Mean	107.6				
Median	105				
Standard Deviation	16.14				
Coefficient of Variation	0.149				
Mann-Kendall Test					
M-K Test Value (S)	-16				
Tabulated p-value	0.315				
Standard Deviation of S	29.62				
Standardized Value of S	-0.506				
Approximate p-value	0.306				
Insufficient evidence to identify a significant					
trend at the specified level of significance.					

Mann-Kendall Trend Test Analysis		
User Selected Options		
Date/Time of Computation	ProUCL 5.110/6/2019 11:30:43 AM	
From File	FCPP_CWTP_CCR_To20190531_AppxIII_Alt_ProUCL_ncl - nonBK Copy.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

Chloride-mw-62

General Statistics	
Number of Events Reported (m)	21
Number of Missing Events	2
Number or Reported Events Used	19
Number Values Reported (n)	21
Number Values Missing	2
Number Values Used	19
Minimum	99
Maximum	150
Mean	122.1
Geometric Mean	121.4
Median	120
Standard Deviation	13.66
Coefficient of Variation	0.112

Mann-Kendall Test	
M-K Test Value (S)	-54
Tabulated p-value	0.029
Standard Deviation of S	27.41
Standardized Value of S	-1.934
Approximate p-value	0.0266

Statistically significant evidence of a decreasing trend at the specified level of significance.

Chloride-mw-63

General Statistics	
Number of Events Reported (m)	21
Number of Missing Events	2
Number or Reported Events Used	19
Number Values Reported (n)	21
Number Values Missing	2
Number Values Used	19
Minimum	77
Maximum	110
Mean	96.26
Geometric Mean	95.98
Median	98
Standard Deviation	7.497
Coefficient of Variation	0.0779

Mann-Kendall Test	
M-K Test Value (S)	-68
Tabulated p-value	0.008
Standard Deviation of S	28.23
Standardized Value of S	-2.374
Approximate p-value	0.0088

Statistically significant evidence of a decreasing trend at the specified level of significance.

Chloride-mw-64

General Statistics	
Number of Events Reported (m)	20
Number of Missing Events	1
Number or Reported Events Used	19
Number Values Reported (n)	20

	A	B	C	D	E	F	G	H	I	J	K	L
68				Number Values Missing	1							
69				Number Values Used	19							
70				Minimum	44							
71				Maximum	53							
72				Mean	50.74							
73				Geometric Mean	50.68							
74				Median	52							
75				Standard Deviation	2.469							
76				Coefficient of Variation	0.0487							
77												
78	**Mann-Kendall Test**											
79				M-K Test Value (S)	10							
80				Tabulated p-value	0.365							
81				Standard Deviation of S	27.84							
82				Standardized Value of S	0.323							
83				Approximate p-value	0.373							
84												
85	**Insufficient evidence to identify a significant**											
86	**trend at the specified level of significance.**											
87	**Chloride-mw-65**											
88												
89	**General Statistics**											
90				Number of Events Reported (m)	20							
91				Number of Missing Events	1							
92				Number or Reported Events Used	19							
93				Number Values Reported (n)	20							
94				Number Values Missing	1							
95				Number Values Used	19							
96				Minimum	51							
97				Maximum	77							
98				Mean	55.53							
99				Geometric Mean	55.21							
100				Median	53							
101				Standard Deviation	6.552							
102				Coefficient of Variation	0.118							
103												
104	**Mann-Kendall Test**											
105				M-K Test Value (S)	-39							
106				Tabulated p-value	0.093							
107				Standard Deviation of S	28.05							
108				Standardized Value of S	-1.355							
109				Approximate p-value	0.0878							
110												
111	**Insufficient evidence to identify a significant**											
112	**trend at the specified level of significance.**											

	Mann-Kendall Trend Test Analysis	
User Selected Options		
Date/Time of Computation	ProUCL 5.110/6/2019 11:31:15 AM	
From File	FCPP_CWTP_CCR_To20190531_AppxIII_Alt_ProUCL_ncl - nonBK Copy.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

Fluoride-mw-62

General Statistics	
Number of Events Reported (m)	21
Number of Missing Events	1
Number or Reported Events Used	20
Number Values Reported (n)	21
Number Values Missing	1
Number Values Used	20
Minimum	1.2
Maximum	3.3
Mean	1.54
Geometric Mean	1.502
Median	1.5
Standard Deviation	0.433
Coefficient of Variation	0.281

Mann-Kendall Test	
M-K Test Value (S)	-14
Tabulated p-value	0.339
Standard Deviation of S	29.61
Standardized Value of S	-0.439
Approximate p-value	0.33

Insufficient evidence to identify a significant trend at the specified level of significance.

Fluoride-mw-63

General Statistics	
Number of Events Reported (m)	21
Number of Missing Events	1
Number or Reported Events Used	20
Number Values Reported (n)	21
Number Values Missing	1
Number Values Used	20
Minimum	1.6
Maximum	2.5
Mean	1.935
Geometric Mean	1.922
Median	1.9
Standard Deviation	0.235
Coefficient of Variation	0.121

Mann-Kendall Test	
M-K Test Value (S)	-47
Tabulated p-value	0.073
Standard Deviation of S	30.18
Standardized Value of S	-1.524
Approximate p-value	0.0637

Insufficient evidence to identify a significant trend at the specified level of significance.

Fluoride-mw-64

General Statistics	
Number of Events Reported (m)	20
Number of Missing Events	0
Number or Reported Events Used	20
Number Values Reported (n)	20

68				Minimum	1.3							
69				Maximum	1.5							
70				Mean	1.43							
71				Geometric Mean	1.429							
72				Median	1.4							
73				Standard Deviation	0.0657							
74				Coefficient of Variation	0.0459							
75												
76	**Mann-Kendall Test**											
77				M-K Test Value (S)	-8							
78				Tabulated p-value	0.411							
79				Standard Deviation of S	27.54							
80				Standardized Value of S	-0.254							
81				Approximate p-value	0.4							
82												
83	**Insufficient evidence to identify a significant**											
84	**trend at the specified level of significance.**											
85	**Fluoride-mw-65**											
86												
87	**General Statistics**											
88				Number of Events Reported (m)	20							
89				Number of Missing Events	0							
90				Number or Reported Events Used	20							
91				Number Values Reported (n)	20							
92				Minimum	1.6							
93				Maximum	2							
94				Mean	1.89							
95				Geometric Mean	1.886							
96				Median	1.9							
97				Standard Deviation	0.125							
98				Coefficient of Variation	0.0663							
99												
100	**Mann-Kendall Test**											
101				M-K Test Value (S)	-1							
102				Tabulated p-value	0.513							
103				Standard Deviation of S	28.98							
104				Standardized Value of S	0							
105				Approximate p-value	0.5							
106												
107	**Insufficient evidence to identify a significant**											
108	**trend at the specified level of significance.**											

	Mann-Kendall Trend Test Analysis	
User Selected Options		
Date/Time of Computation	ProUCL 5.110/6/2019 11:32:52 AM	
From File	FCPP_CWTP_CCR_To20190531_AppxIII_Alt_ProUCL_ncl - nonBK Copy.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

Field_pH-mw-62

General Statistics

Number of Events Reported (m)	21
Number of Missing Events	0
Number or Reported Events Used	21
Number Values Reported (n)	21
Minimum	6.36
Maximum	7.4
Mean	6.608
Geometric Mean	6.604
Median	6.59
Standard Deviation	0.217
Coefficient of Variation	0.0328

Mann-Kendall Test

M-K Test Value (S)	-58
Tabulated p-value	0.043
Standard Deviation of S	33.06
Standardized Value of S	-1.724
Approximate p-value	0.0423

Statistically significant evidence of a decreasing trend at the specified level of significance.

Field_pH-mw-63

General Statistics

Number of Events Reported (m)	21
Number of Missing Events	0
Number or Reported Events Used	21
Number Values Reported (n)	21
Minimum	6.53
Maximum	7.03
Mean	6.763
Geometric Mean	6.762
Median	6.78
Standard Deviation	0.119
Coefficient of Variation	0.0176

Mann-Kendall Test

M-K Test Value (S)	-85
Tabulated p-value	0.005
Standard Deviation of S	33.1
Standardized Value of S	-2.538
Approximate p-value	0.00558

Statistically significant evidence of a decreasing trend at the specified level of significance.

Field_pH-mw-64

General Statistics

Number of Events Reported (m)	20
Number of Missing Events	0
Number or Reported Events Used	20
Number Values Reported (n)	20
Minimum	7.29
Maximum	7.68
Mean	7.462
Geometric Mean	7.461

68				Median	7.46							
69				Standard Deviation	0.112							
70				Coefficient of Variation	0.015							
71												
72	**Mann-Kendall Test**											
73				M-K Test Value (S)	-51							
74				Tabulated p-value	0.056							
75				Standard Deviation of S	30.77							
76				Standardized Value of S	-1.625							
77				Approximate p-value	0.0521							
78												
79	**Insufficient evidence to identify a significant**											
80	**trend at the specified level of significance.**											
81	**Field_pH-mw-65**											
82												
83	**General Statistics**											
84				Number of Events Reported (m)	20							
85				Number of Missing Events	0							
86				Number or Reported Events Used	20							
87				Number Values Reported (n)	20							
88				Minimum	6.96							
89				Maximum	8.27							
90				Mean	7.266							
91				Geometric Mean	7.261							
92				Median	7.21							
93				Standard Deviation	0.277							
94				Coefficient of Variation	0.0382							
95												
96	**Mann-Kendall Test**											
97				M-K Test Value (S)	-74							
98				Tabulated p-value	0.008							
99				Standard Deviation of S	30.79							
100				Standardized Value of S	-2.371							
101				Approximate p-value	0.00887							
102												
103	**Statistically significant evidence of a decreasing**											
104	**trend at the specified level of significance.**											

Mann-Kendall Trend Test Analysis		
User Selected Options		
Date/Time of Computation	ProUCL 5.110/6/2019 11:31:49 AM	
From File	FCPP_CWTP_CCR_To20190531_AppxIII_Alt_ProUCL_ncl - nonBK Copy.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

Sulfate-mw-62

General Statistics	
Number of Events Reported (m)	21
Number of Missing Events	2
Number or Reported Events Used	19
Number Values Reported (n)	21
Number Values Missing	2
Number Values Used	19
Minimum	3200
Maximum	3800
Mean	3384
Geometric Mean	3381
Median	3300
Standard Deviation	153.7
Coefficient of Variation	0.0454

Mann-Kendall Test	
M-K Test Value (S)	11
Tabulated p-value	0.365
Standard Deviation of S	26.8
Standardized Value of S	0.373
Approximate p-value	0.355

Insufficient evidence to identify a significant trend at the specified level of significance.

Sulfate-mw-63

General Statistics	
Number of Events Reported (m)	21
Number of Missing Events	2
Number or Reported Events Used	19
Number Values Reported (n)	21
Number Values Missing	2
Number Values Used	19
Minimum	2300
Maximum	4300
Mean	2789
Geometric Mean	2768
Median	2700
Standard Deviation	394.3
Coefficient of Variation	0.141

Mann-Kendall Test	
M-K Test Value (S)	14
Tabulated p-value	0.314
Standard Deviation of S	27.8
Standardized Value of S	0.468
Approximate p-value	0.32

Insufficient evidence to identify a significant trend at the specified level of significance.

Sulfate-mw-64

General Statistics	
Number of Events Reported (m)	20
Number of Missing Events	1
Number or Reported Events Used	19
Number Values Reported (n)	20

Number Values Missing	1	
Number Values Used	19	
Minimum	320	
Maximum	870	
Mean	380	
Geometric Mean	369.3	
Median	350	
Standard Deviation	120.6	
Coefficient of Variation	0.317	
Mann-Kendall Test		
M-K Test Value (S)	59	
Tabulated p-value	0.021	
Standard Deviation of S	28.28	
Standardized Value of S	2.051	
Approximate p-value	0.0201	
Statistically significant evidence of an increasing		
trend at the specified level of significance.		
Sulfate-mw-65		
General Statistics		
Number of Events Reported (m)	20	
Number of Missing Events	1	
Number or Reported Events Used	19	
Number Values Reported (n)	20	
Number Values Missing	1	
Number Values Used	19	
Minimum	400	
Maximum	790	
Mean	487.9	
Geometric Mean	480.4	
Median	460	
Standard Deviation	98.35	
Coefficient of Variation	0.202	
Mann-Kendall Test		
M-K Test Value (S)	0	
Tabulated p-value	0.5	
Standard Deviation of S	28.4	
Standardized Value of S	N/A	
Approximate p-value	N/A	
Insufficient evidence to identify a significant		
trend at the specified level of significance.		

Mann-Kendall Trend Test Analysis		
User Selected Options		
Date/Time of Computation	ProUCL 5.110/6/2019 11:32:21 AM	
From File	FCPP_CWTP_CCR_To20190531_AppxIII_Alt_ProUCL_ncl - nonBK Copy.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

DissolvedSolids-mw-62

General Statistics

Number of Events Reported (m)	21
Number of Missing Events	1
Number or Reported Events Used	20
Number Values Reported (n)	21
Number Values Missing	1
Number Values Used	20
Minimum	2400
Maximum	6700
Mean	5595
Geometric Mean	5509
Median	5750
Standard Deviation	810.8
Coefficient of Variation	0.145

Mann-Kendall Test

M-K Test Value (S)	-46
Tabulated p-value	0.073
Standard Deviation of S	30.48
Standardized Value of S	-1.476
Approximate p-value	0.07

Insufficient evidence to identify a significant trend at the specified level of significance.

DissolvedSolids-mw-63

General Statistics

Number of Events Reported (m)	21
Number of Missing Events	1
Number or Reported Events Used	20
Number Values Reported (n)	21
Number Values Missing	1
Number Values Used	20
Minimum	4100
Maximum	4700
Mean	4410
Geometric Mean	4407
Median	4400
Standard Deviation	155.3
Coefficient of Variation	0.0352

Mann-Kendall Test

M-K Test Value (S)	10
Tabulated p-value	0.387
Standard Deviation of S	29.92
Standardized Value of S	0.301
Approximate p-value	0.382

Insufficient evidence to identify a significant trend at the specified level of significance.

DissolvedSolids-mw-64

General Statistics

Number of Events Reported (m)	20
Number of Missing Events	0
Number or Reported Events Used	20
Number Values Reported (n)	20

68				Minimum	760							
69				Maximum	890							
70				Mean	794.5							
71				Geometric Mean	794.1							
72				Median	790							
73				Standard Deviation	25.64							
74				Coefficient of Variation	0.0323							
75												
76	**Mann-Kendall Test**											
77				M-K Test Value (S)	-22							
78				Tabulated p-value	0.25							
79				Standard Deviation of S	29.79							
80				Standardized Value of S	-0.705							
81				Approximate p-value	0.24							
82												
83	**Insufficient evidence to identify a significant**											
84	**trend at the specified level of significance.**											
85	**DissolvedSolids-mw-65**											
86												
87	**General Statistics**											
88				Number of Events Reported (m)	20							
89				Number of Missing Events	0							
90				Number or Reported Events Used	20							
91				Number Values Reported (n)	20							
92				Minimum	940							
93				Maximum	1500							
94				Mean	1072							
95				Geometric Mean	1062							
96				Median	1000							
97				Standard Deviation	153							
98				Coefficient of Variation	0.143							
99												
100	**Mann-Kendall Test**											
101				M-K Test Value (S)	-67							
102				Tabulated p-value	0.017							
103				Standard Deviation of S	29.58							
104				Standardized Value of S	-2.231							
105				Approximate p-value	0.0128							
106												
107	**Statistically significant evidence of a decreasing**											
108	**trend at the specified level of significance.**											

	Outlier Tests for Selected Uncensored Variables	
User Selected Options		
Date/Time of Computation	ProUCL 5.110/6/2019 11:39:35 AM	
From File	FCPP_CWTP_CCR_To20190531_AppxIII_Alt_ProUCL_ncl - nonBK Copy.xls	
Full Precision	OFF	

Dixon's Outlier Test for Boron (mw-62)

Number of Observations = 21
10% critical value: 0.391
5% critical value: 0.44
1% critical value: 0.524

1. Observation Value 2.5 is a Potential Outlier (Upper

Test Statistic: 0.333

For 10% significance level, 2.5 is not an outlier.
For 5% significance level, 2.5 is not an outlier.
For 1% significance level, 2.5 is not an outlier.

2. Observation Value 1.8 is a Potential Outlier (Lower

Test Statistic: 0.200

For 10% significance level, 1.8 is not an outlier.
For 5% significance level, 1.8 is not an outlier.
For 1% significance level, 1.8 is not an outlier.

Dixon's Outlier Test for Boron (mw-63)

Number of Observations = 21
10% critical value: 0.391
5% critical value: 0.44
1% critical value: 0.524

1. Observation Value 2 is a Potential Outlier (Upper T

Test Statistic: 0.143

For 10% significance level, 2 is not an outlier.
For 5% significance level, 2 is not an outlier.
For 1% significance level, 2 is not an outlier.

2. Observation Value 1.3 is a Potential Outlier (Lower

Test Statistic: 0.000

For 10% significance level, 1.3 is not an outlier.
For 5% significance level, 1.3 is not an outlier.
For 1% significance level, 1.3 is not an outlier.

Dixon's Outlier Test for Boron (mw-64)

Number of Observations = 20
10% critical value: 0.401
5% critical value: 0.45
1% critical value: 0.535

1. Observation Value 0.67 is a Potential Outlier (Upp

Test Statistic: 0.167

For 10% significance level, 0.67 is not an outlier.

	A	B	C	D	E	F	G	H	I	J	K	L
68	For 5% significance level, 0.67 is not an outlier.											
69	For 1% significance level, 0.67 is not an outlier.											
70												
71	**2. Observation Value 0.48 is a Potential Outlier (Lowe**											
72												
73	Test Statistic: 0.412											
74												
75	For 10% significance level, 0.48 is an outlier.											
76	For 5% significance level, 0.48 is not an outlier.											
77	For 1% significance level, 0.48 is not an outlier.											
78												
79												
80	**Dixon's Outlier Test for Boron (mw-65)**											
81												
82	Number of Observations = 20											
83	10% critical value: 0.401											
84	5% critical value: 0.45											
85	1% critical value: 0.535											
86												
87	**1. Observation Value 0.98 is a Potential Outlier (Upp**											
88												
89	Test Statistic: 0.522											
90												
91	For 10% significance level, 0.98 is an outlier.											
92	For 5% significance level, 0.98 is an outlier.											
93	For 1% significance level, 0.98 is not an outlier.											
94												
95	**2. Observation Value 0.6 is a Potential Outlier (Lower**											
96												
97	Test Statistic: 0.577											
98												
99	For 10% significance level, 0.6 is an outlier.											
100	For 5% significance level, 0.6 is an outlier.											
101	For 1% significance level, 0.6 is an outlier.											
102												
103												
104	**Dixon's Outlier Test for Calcium (mw-62)**											
105												
106	Number of Observations = 21											
107	10% critical value: 0.391											
108	5% critical value: 0.44											
109	1% critical value: 0.524											
110												
111	**1. Observation Value 590 is a Potential Outlier (Uppe**											
112												
113	Test Statistic: 0.222											
114												
115	For 10% significance level, 590 is not an outlier.											
116	For 5% significance level, 590 is not an outlier.											
117	For 1% significance level, 590 is not an outlier.											
118												
119	**2. Observation Value 480 is a Potential Outlier (Lowe**											
120												
121	Test Statistic: 0.222											
122												
123	For 10% significance level, 480 is not an outlier.											
124	For 5% significance level, 480 is not an outlier.											
125	For 1% significance level, 480 is not an outlier.											
126												
127												
128	**Dixon's Outlier Test for Calcium (mw-63)**											
129												
130	Number of Observations = 21											
131	10% critical value: 0.391											
132	5% critical value: 0.44											
133	1% critical value: 0.524											
134												

	A	B	C	D	E	F	G	H	I	J	K	L
135	**1. Observation Value 580 is a Potential Outlier (Uppe**											
136												
137	Test Statistic: 0.375											
138												
139	For 10% significance level, 580 is not an outlier.											
140	For 5% significance level, 580 is not an outlier.											
141	For 1% significance level, 580 is not an outlier.											
142												
143	**2. Observation Value 420 is a Potential Outlier (Lowe**											
144												
145	Test Statistic: 0.615											
146												
147	For 10% significance level, 420 is an outlier.											
148	For 5% significance level, 420 is an outlier.											
149	For 1% significance level, 420 is an outlier.											
150												
151												
152	**Dixon's Outlier Test for Calcium (mw-64)**											
153												
154	Number of Observations = 20											
155	10% critical value: 0.401											
156	5% critical value: 0.45											
157	1% critical value: 0.535											
158												
159	**1. Observation Value 93 is a Potential Outlier (Upper**											
160												
161	Test Statistic: 0.375											
162												
163	For 10% significance level, 93 is not an outlier.											
164	For 5% significance level, 93 is not an outlier.											
165	For 1% significance level, 93 is not an outlier.											
166												
167	**2. Observation Value 82 is a Potential Outlier (Lower**											
168												
169	Test Statistic: 0.375											
170												
171	For 10% significance level, 82 is not an outlier.											
172	For 5% significance level, 82 is not an outlier.											
173	For 1% significance level, 82 is not an outlier.											
174												
175												
176	**Dixon's Outlier Test for Calcium (mw-65)**											
177												
178	Number of Observations = 20											
179	10% critical value: 0.401											
180	5% critical value: 0.45											
181	1% critical value: 0.535											
182												
183	**1. Observation Value 160 is a Potential Outlier (Uppe**											
184												
185	Test Statistic: 0.625											
186												
187	For 10% significance level, 160 is an outlier.											
188	For 5% significance level, 160 is an outlier.											
189	For 1% significance level, 160 is an outlier.											
190												
191	**2. Observation Value 92 is a Potential Outlier (Lower**											
192												
193	Test Statistic: 0.143											
194												
195	For 10% significance level, 92 is not an outlier.											
196	For 5% significance level, 92 is not an outlier.											
197	For 1% significance level, 92 is not an outlier.											
198												
199												
200	**Dixon's Outlier Test for Chloride (mw-62)**											
201												

	A	B	C	D	E	F	G	H	I	J	K	L
202	Number of Observations = 19											
203	10% critical value: 0.412											
204	5% critical value: 0.462											
205	1% critical value: 0.547											
206												
207	**1. Observation Value 150 is a Potential Outlier (Uppe**											
208												
209	Test Statistic: 0.250											
210												
211	For 10% significance level, 150 is not an outlier.											
212	For 5% significance level, 150 is not an outlier.											
213	For 1% significance level, 150 is not an outlier.											
214												
215	**2. Observation Value 99 is a Potential Outlier (Lower**											
216												
217	Test Statistic: 0.268											
218												
219	For 10% significance level, 99 is not an outlier.											
220	For 5% significance level, 99 is not an outlier.											
221	For 1% significance level, 99 is not an outlier.											
222												
223												
224	**Dixon's Outlier Test for Chloride (mw-63)**											
225												
226	Number of Observations = 19											
227	10% critical value: 0.412											
228	5% critical value: 0.462											
229	1% critical value: 0.547											
230												
231	**1. Observation Value 110 is a Potential Outlier (Uppe**											
232												
233	Test Statistic: 0.500											
234												
235	For 10% significance level, 110 is an outlier.											
236	For 5% significance level, 110 is an outlier.											
237	For 1% significance level, 110 is not an outlier.											
238												
239	**2. Observation Value 77 is a Potential Outlier (Lower**											
240												
241	Test Statistic: 0.565											
242												
243	For 10% significance level, 77 is an outlier.											
244	For 5% significance level, 77 is an outlier.											
245	For 1% significance level, 77 is an outlier.											
246												
247												
248	**Dixon's Outlier Test for Chloride (mw-64)**											
249												
250	Number of Observations = 19											
251	10% critical value: 0.412											
252	5% critical value: 0.462											
253	1% critical value: 0.547											
254												
255	**1. Observation Value 53 is a Potential Outlier (Upper**											
256												
257	Test Statistic: 0.000											
258												
259	For 10% significance level, 53 is not an outlier.											
260	For 5% significance level, 53 is not an outlier.											
261	For 1% significance level, 53 is not an outlier.											
262												
263	**2. Observation Value 44 is a Potential Outlier (Lower**											
264												
265	Test Statistic: 0.444											
266												
267	For 10% significance level, 44 is an outlier.											
268	For 5% significance level, 44 is not an outlier.											

For 1% significance level, 44 is not an outlier.

Dixon's Outlier Test for Chloride (mw-65)

Number of Observations = 19
10% critical value: 0.412
5% critical value: 0.462
1% critical value: 0.547

1. Observation Value 77 is a Potential Outlier (Upper

Test Statistic: 0.680

For 10% significance level, 77 is an outlier.
For 5% significance level, 77 is an outlier.
For 1% significance level, 77 is an outlier.

2. Observation Value 51 is a Potential Outlier (Lower

Test Statistic: 0.111

For 10% significance level, 51 is not an outlier.
For 5% significance level, 51 is not an outlier.
For 1% significance level, 51 is not an outlier.

Dixon's Outlier Test for Fluoride (mw-62)

Number of Observations = 20
10% critical value: 0.401
5% critical value: 0.45
1% critical value: 0.535

1. Observation Value 3.3 is a Potential Outlier (Uppe

Test Statistic: 0.810

For 10% significance level, 3.3 is an outlier.
For 5% significance level, 3.3 is an outlier.
For 1% significance level, 3.3 is an outlier.

2. Observation Value 1.2 is a Potential Outlier (Lower

Test Statistic: 0.000

For 10% significance level, 1.2 is not an outlier.
For 5% significance level, 1.2 is not an outlier.
For 1% significance level, 1.2 is not an outlier.

Dixon's Outlier Test for Fluoride (mw-63)

Number of Observations = 20
10% critical value: 0.401
5% critical value: 0.45
1% critical value: 0.535

1. Observation Value 2.5 is a Potential Outlier (Uppe

Test Statistic: 0.444

For 10% significance level, 2.5 is an outlier.
For 5% significance level, 2.5 is not an outlier.
For 1% significance level, 2.5 is not an outlier.

2. Observation Value 1.6 is a Potential Outlier (Lower

	A	B	C	D	E	F	G	H	I	J	K	L
336												
337	Test Statistic: 0.000											
338												
339	For 10% significance level, 1.6 is not an outlier.											
340	For 5% significance level, 1.6 is not an outlier.											
341	For 1% significance level, 1.6 is not an outlier.											
342												
343												
344	**Dixon's Outlier Test for Fluoride (mw-64)**											
345												
346	Number of Observations = 20											
347	10% critical value: 0.401											
348	5% critical value: 0.45											
349	1% critical value: 0.535											
350												
351	**1. Observation Value 1.5 is a Potential Outlier (Uppe**											
352												
353	Test Statistic: 0.000											
354												
355	For 10% significance level, 1.5 is not an outlier.											
356	For 5% significance level, 1.5 is not an outlier.											
357	For 1% significance level, 1.5 is not an outlier.											
358												
359	**2. Observation Value 1.3 is a Potential Outlier (Lower**											
360												
361	Test Statistic: 0.500											
362												
363	For 10% significance level, 1.3 is an outlier.											
364	For 5% significance level, 1.3 is an outlier.											
365	For 1% significance level, 1.3 is not an outlier.											
366												
367												
368	**Dixon's Outlier Test for Fluoride (mw-65)**											
369												
370	Number of Observations = 20											
371	10% critical value: 0.401											
372	5% critical value: 0.45											
373	1% critical value: 0.535											
374												
375	**1. Observation Value 2 is a Potential Outlier (Upper T**											
376												
377	Test Statistic: 0.000											
378												
379	For 10% significance level, 2 is not an outlier.											
380	For 5% significance level, 2 is not an outlier.											
381	For 1% significance level, 2 is not an outlier.											
382												
383	**2. Observation Value 1.6 is a Potential Outlier (Lower**											
384												
385	Test Statistic: 0.250											
386												
387	For 10% significance level, 1.6 is not an outlier.											
388	For 5% significance level, 1.6 is not an outlier.											
389	For 1% significance level, 1.6 is not an outlier.											
390												
391												
392	**Dixon's Outlier Test for Sulfate (mw-62)**											
393												
394	Number of Observations = 19											
395	10% critical value: 0.412											
396	5% critical value: 0.462											
397	1% critical value: 0.547											
398												
399	**1. Observation Value 3800 is a Potential Outlier (Upp**											
400												
401	Test Statistic: 0.400											
402												

	A	B	C	D	E	F	G	H	I	J	K	L
403	For 10% significance level, 3800 is not an outlier.											
404	For 5% significance level, 3800 is not an outlier.											
405	For 1% significance level, 3800 is not an outlier.											
406												
407	**2. Observation Value 3200 is a Potential Outlier (Low**											
408												
409	Test Statistic: 0.250											
410												
411	For 10% significance level, 3200 is not an outlier.											
412	For 5% significance level, 3200 is not an outlier.											
413	For 1% significance level, 3200 is not an outlier.											
414												
415												
416	**Dixon's Outlier Test for Sulfate (mw-63)**											
417												
418	Number of Observations = 19											
419	10% critical value: 0.412											
420	5% critical value: 0.462											
421	1% critical value: 0.547											
422												
423	**1. Observation Value 4300 is a Potential Outlier (Upp**											
424												
425	Test Statistic: 0.824											
426												
427	For 10% significance level, 4300 is an outlier.											
428	For 5% significance level, 4300 is an outlier.											
429	For 1% significance level, 4300 is an outlier.											
430												
431	**2. Observation Value 2300 is a Potential Outlier (Low**											
432												
433	Test Statistic: 0.500											
434												
435	For 10% significance level, 2300 is an outlier.											
436	For 5% significance level, 2300 is an outlier.											
437	For 1% significance level, 2300 is not an outlier.											
438												
439												
440	**Dixon's Outlier Test for Sulfate (mw-64)**											
441												
442	Number of Observations = 19											
443	10% critical value: 0.412											
444	5% critical value: 0.462											
445	1% critical value: 0.547											
446												
447	**1. Observation Value 870 is a Potential Outlier (Uppe**											
448												
449	Test Statistic: 0.889											
450												
451	For 10% significance level, 870 is an outlier.											
452	For 5% significance level, 870 is an outlier.											
453	For 1% significance level, 870 is an outlier.											
454												
455	**2. Observation Value 320 is a Potential Outlier (Lowe**											
456												
457	Test Statistic: 0.143											
458												
459	For 10% significance level, 320 is not an outlier.											
460	For 5% significance level, 320 is not an outlier.											
461	For 1% significance level, 320 is not an outlier.											
462												
463												
464	**Dixon's Outlier Test for Sulfate (mw-65)**											
465												
466	Number of Observations = 19											
467	10% critical value: 0.412											
468	5% critical value: 0.462											
469	1% critical value: 0.547											

	A	B	C	D	E	F	G	H	I	J	K	L
470												
471	**1. Observation Value 790 is a Potential Outlier (Uppe**											
472												
473	Test Statistic: 0.763											
474												
475	For 10% significance level, 790 is an outlier.											
476	For 5% significance level, 790 is an outlier.											
477	For 1% significance level, 790 is an outlier.											
478												
479	**2. Observation Value 400 is a Potential Outlier (Lowe**											
480												
481	Test Statistic: 0.100											
482												
483	For 10% significance level, 400 is not an outlier.											
484	For 5% significance level, 400 is not an outlier.											
485	For 1% significance level, 400 is not an outlier.											
486												
487												
488	**Dixon's Outlier Test for DissolvedSolids (mw-62)**											
489												
490	Number of Observations = 20											
491	10% critical value: 0.401											
492	5% critical value: 0.45											
493	1% critical value: 0.535											
494												
495	**1. Observation Value 6700 is a Potential Outlier (Upp**											
496												
497	Test Statistic: 0.538											
498												
499	For 10% significance level, 6700 is an outlier.											
500	For 5% significance level, 6700 is an outlier.											
501	For 1% significance level, 6700 is an outlier.											
502												
503	**2. Observation Value 2400 is a Potential Outlier (Low**											
504												
505	Test Statistic: 0.833											
506												
507	For 10% significance level, 2400 is an outlier.											
508	For 5% significance level, 2400 is an outlier.											
509	For 1% significance level, 2400 is an outlier.											
510												
511												
512	**Dixon's Outlier Test for DissolvedSolids (mw-63)**											
513												
514	Number of Observations = 20											
515	10% critical value: 0.401											
516	5% critical value: 0.45											
517	1% critical value: 0.535											
518												
519	**1. Observation Value 4700 is a Potential Outlier (Upp**											
520												
521	Test Statistic: 0.250											
522												
523	For 10% significance level, 4700 is not an outlier.											
524	For 5% significance level, 4700 is not an outlier.											
525	For 1% significance level, 4700 is not an outlier.											
526												
527	**2. Observation Value 4100 is a Potential Outlier (Low**											
528												
529	Test Statistic: 0.400											
530												
531	For 10% significance level, 4100 is not an outlier.											
532	For 5% significance level, 4100 is not an outlier.											
533	For 1% significance level, 4100 is not an outlier.											
534												
535												
536	**Dixon's Outlier Test for DissolvedSolids (mw-64)**											

	A	B	C	D	E	F	G	H	I	J	K	L
537												
538	Number of Observations = 20											
539	10% critical value: 0.401											
540	5% critical value: 0.45											
541	1% critical value: 0.535											
542												
543	**1. Observation Value 890 is a Potential Outlier (Uppe**											
544												
545	Test Statistic: 0.727											
546												
547	For 10% significance level, 890 is an outlier.											
548	For 5% significance level, 890 is an outlier.											
549	For 1% significance level, 890 is an outlier.											
550												
551	**2. Observation Value 760 is a Potential Outlier (Lowe**											
552												
553	Test Statistic: 0.400											
554												
555	For 10% significance level, 760 is not an outlier.											
556	For 5% significance level, 760 is not an outlier.											
557	For 1% significance level, 760 is not an outlier.											
558												
559												
560	**Dixon's Outlier Test for DissolvedSolids (mw-65)**											
561												
562	Number of Observations = 20											
563	10% critical value: 0.401											
564	5% critical value: 0.45											
565	1% critical value: 0.535											
566												
567	**1. Observation Value 1500 is a Potential Outlier (Upp**											
568												
569	Test Statistic: 0.377											
570												
571	For 10% significance level, 1500 is not an outlier.											
572	For 5% significance level, 1500 is not an outlier.											
573	For 1% significance level, 1500 is not an outlier.											
574												
575	**2. Observation Value 940 is a Potential Outlier (Lowe**											
576												
577	Test Statistic: 0.083											
578												
579	For 10% significance level, 940 is not an outlier.											
580	For 5% significance level, 940 is not an outlier.											
581	For 1% significance level, 940 is not an outlier.											
582												
583												
584	**Dixon's Outlier Test for Field_pH (mw-62)**											
585												
586	Number of Observations = 21											
587	10% critical value: 0.391											
588	5% critical value: 0.44											
589	1% critical value: 0.524											
590												
591	**1. Observation Value 7.4 is a Potential Outlier (Uppe**											
592												
593	Test Statistic: 0.677											
594												
595	For 10% significance level, 7.4 is an outlier.											
596	For 5% significance level, 7.4 is an outlier.											
597	For 1% significance level, 7.4 is an outlier.											
598												
599	**2. Observation Value 6.36 is a Potential Outlier (Lowe**											
600												
601	Test Statistic: 0.135											
602												
603	For 10% significance level, 6.36 is not an outlier.											

	A	B	C	D	E	F	G	H	I	J	K	L
604	For 5% significance level, 6.36 is not an outlier.											
605	For 1% significance level, 6.36 is not an outlier.											
606												
607												
608	**Dixon's Outlier Test for Field_pH (mw-63)**											
609												
610	Number of Observations = 21											
611	10% critical value: 0.391											
612	5% critical value: 0.44											
613	1% critical value: 0.524											
614												
615	**1. Observation Value 7.03 is a Potential Outlier (Upp**											
616												
617	Test Statistic: 0.375											
618												
619	For 10% significance level, 7.03 is not an outlier.											
620	For 5% significance level, 7.03 is not an outlier.											
621	For 1% significance level, 7.03 is not an outlier.											
622												
623	**2. Observation Value 6.53 is a Potential Outlier (Lowe**											
624												
625	Test Statistic: 0.286											
626												
627	For 10% significance level, 6.53 is not an outlier.											
628	For 5% significance level, 6.53 is not an outlier.											
629	For 1% significance level, 6.53 is not an outlier.											
630												
631												
632	**Dixon's Outlier Test for Field_pH (mw-64)**											
633												
634	Number of Observations = 20											
635	10% critical value: 0.401											
636	5% critical value: 0.45											
637	1% critical value: 0.535											
638												
639	**1. Observation Value 7.68 is a Potential Outlier (Upp**											
640												
641	Test Statistic: 0.189											
642												
643	For 10% significance level, 7.68 is not an outlier.											
644	For 5% significance level, 7.68 is not an outlier.											
645	For 1% significance level, 7.68 is not an outlier.											
646												
647	**2. Observation Value 7.29 is a Potential Outlier (Lowe**											
648												
649	Test Statistic: 0.062											
650												
651	For 10% significance level, 7.29 is not an outlier.											
652	For 5% significance level, 7.29 is not an outlier.											
653	For 1% significance level, 7.29 is not an outlier.											
654												
655												
656	**Dixon's Outlier Test for Field_pH (mw-65)**											
657												
658	Number of Observations = 20											
659	10% critical value: 0.401											
660	5% critical value: 0.45											
661	1% critical value: 0.535											
662												
663	**1. Observation Value 8.27 is a Potential Outlier (Upp**											
664												
665	Test Statistic: 0.636											
666												
667	For 10% significance level, 8.27 is an outlier.											
668	For 5% significance level, 8.27 is an outlier.											
669	For 1% significance level, 8.27 is an outlier.											
670												

	A	B	C	D	E	F	G	H	I	J	K	L
671	**2. Observation Value 6.96 is a Potential Outlier (Lowe**											
672												
673	Test Statistic: 0.185											
674												
675	For 10% significance level, 6.96 is not an outlier.											
676	For 5% significance level, 6.96 is not an outlier.											
677	For 1% significance level, 6.96 is not an outlier.											
678												

APPENDIX G

WOOD REPORT DOCUMENTING THE HYDROGEOLOGIC INVESTIGATION OF MULTIUNIT 1 AND THE URS

wood.

HYDROGEOLOGIC INVESTIGATION
OF MULTIUNIT 1 AND THE UPPER RETENTION SUMP
Coal Combustion Residuals Rule Groundwater Monitoring System Compliance
Arizona Public Service Company
Four Corners Power Plant
Fruitland, New Mexico

Submitted to:

Arizona Public Service Company
400 North 5th Street
Phoenix, Arizona 85004

Submitted by:

Wood Environment & Infrastructure Solutions, Inc.
Phoenix, Arizona



January 31, 2020

Wood Project No. 14-2018-2068

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List of Acronyms and Abbreviations

§	Section
Amec Foster Wheeler	Amec Foster Wheeler Environment & Infrastructure, Inc.
amsl	above mean sea level
APS	Arizona Public Service
bgs	below ground surface
CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
CSM	Conceptual Site Model
CWTP	Combined Waste Treatment Pond
DFADA	Dry Fly Ash Disposal Area
FCPP	Four Corners Power Plant
FGD	Flue Gas Desulfurization
ft	foot, feet
gpm	gallons per minute
GWPS(s)	Groundwater Protection Standard(s)
LAI	Lined Ash Impoundment
LDWP	Lined Decant Water Pond
MCL	Maximum Contaminant Level
mg/L	milligrams per liter
Multiunit 1	CCR multiunit comprised of the LAI and LDWP
NTUs	nephelometric turbidity units
PVC	polyvinyl chloride
SSI	statistically significant increase
SSL	statistically significant level
URS	Upper Retention Sump
Wood	Wood Environment & Infrastructure Solutions, Inc.

1.0 Introduction

On behalf of Arizona Public Service (APS), Wood Environment & Infrastructure Solutions, Inc. (Wood) prepared this *Hydrogeologic Investigation of Multiunit 1 and the Upper Retention Sump (URS)* to characterize the nature and extent of potential contaminant releases from coal combustion residuals (CCR) units located at the Four Corners Power Plant (FCPP or the Site) in Fruitland, New Mexico. The report documents investigation activities required by 40 Code of Federal Regulations (CFR) Part 257 (herein referred to as the CCR Rule; Federal Register, 2018) to support a future assessment of corrective measures for identified groundwater impacts.

The CCR Rule became effective on October 19, 2015 and established standards for the disposal of CCR in landfills and surface impoundments (CCR units) at applicable sites. In particular, the rule set forth groundwater monitoring and corrective action requirements for CCR units in 40 CFR Sections (§) 257.90 through 257.95. APS has initiated CCR Rule groundwater compliance activities at FCPP and conducted statistical assessments of collected groundwater data (Wood 2018a and Wood 2018b). Based on these statistical assessments, there is evidence to suggest that releases from the subject CCR units (i.e., the URS and Multiunit 1) have occurred and require additional investigation.

The remainder of this section (Section 1.0) provides a summary description of the power generating facility, site CCR units, the facility's environmental setting, and groundwater compliance activities conducted at the Site which form the basis for this hydrogeological investigation. Section 2.0 documents field activities conducted as part of the investigation, and Section 3.0 presents an evaluation of collected data from the investigation. Recommendations for future work are summarized in Section 4.0. Section 5.0 presents report references.

1.1 Site Background

1.1.1 Facility and CCR Unit Description

Facility Description. FCPP is an operating power plant owned by APS and four other utilities. The plant burns low sulfur coal in two electrical generating units (Units 4 and 5) and has a net generating capacity of 1,540 megawatts. FCPP formerly had five generating units and a capacity of 2,040 megawatts; Units 1, 2, and 3 were retired in December 2013 and decommissioned between 2014 and 2016. Coal burned at the plant is generally sourced from the nearby Navajo Mine (Navajo Transitional Energy Company, 2016).

Facility Location. The plant and associated infrastructure are located approximately 20 miles southwest of the city of Farmington, in the Colorado Plateau physiographic province of northwestern New Mexico (Figure 1-1). The land on which the plant resides is leased from the Navajo Nation and is primarily located in Section 36, Township 29 North, and Range 16 West.

CCR Unit Description. Plant infrastructure includes three single CCR units and one CCR multiunit (referred to as Multiunit 1) which are located in the main plant area and to the west of the plant within the FCPP lease boundary (also known as the disposal area), respectively (Figure 1-2). Table 1-1 summarizes the location, function, operation, size/construction, and history of each unit. The boundaries of CCR units depicted in Figure 1-2 are based on available historical plans for the units.

Multiple monitoring well systems (which consist of background wells and downgradient waste boundary wells for each unit) are in place at FCPP to monitor groundwater conditions associated with site CCR units (Table 1-2). The installation of these networks is documented in the *CCR Monitoring Well Network Report and Certification* and is identified as compliant with 40 CFR §257.91(a) through (e) (AECOM, 2017).

1.1.2 Environmental Setting

Unless otherwise noted, the following information is abstracted from AECOM (2017).

Climate. The Site is located in a semi-arid climate on the western flank of the San Juan Basin. The area receives an average of 8.6 inches of precipitation and 12.6 inches of snow per year.

Topography. The main plant area of the FCPP is located at an elevation of approximately 5,340 to 5,360 feet (ft) above mean sea level (amsl). The topography of the FCPP area is characterized by rolling terrain, steep escarpments, and incised drainages/arroyos. In the vicinity of the plant, the ground surface is relatively flat, sloping to the west at approximately 20 ft per mile; however, surface drainage immediately near Morgan Lake flows towards the lake. About one mile west of the plant, the level ground surface drops rapidly to 5,200 ft amsl. Chaco Wash (a.k.a. Chaco River) is located west of this abrupt change in elevation and ephemerally flows north to the San Juan River.

Surface Water Hydrology. FCPP is situated on the southern bank of Morgan Lake, an approximately 1,300-acre man-made lake that has a maximum storage capacity of 39,000 acre-ft of water and supplies cooling water to the plant. Morgan Lake was formed by damming a westerly flowing stream (now known as 'No Name Wash') and is replenished by an underground pipeline (i.e., aqueduct) that routes flow from the San Juan River located approximately 3 miles north of the FCPP. The typical water surface elevation of the lake is 5,330 ft amsl. Morgan Dam discharges to 'No Name Wash' which flows west of the lake to Chaco Wash.

Site Geology. The San Juan Basin is a structural depression that lies at the eastern edge of the Colorado Plateau (Dames & Moore, 1988). The dominant geographic feature in the vicinity of FCPP is the Hogback Monocline located to the west of the plant; this monocline is a steep (38 degree) eastward-dipping flank composed of Cretaceous sedimentary rock (Dames & Moore, 1988).

There are two 'uppermost geologic units' that underlie the FCPP site and immediate vicinity. These units are expected to influence groundwater flow and variations in naturally occurring constituent concentrations across the Site. The units are as follows:

- *Pictured Cliffs Sandstone:* The Pictured Cliffs Sandstone is the uppermost geologic unit beneath the plant and the CCR units located in this vicinity (i.e., the URS and the Combined Waste Treatment Pond [CWTP] as depicted in Figure 1-2). This unit is a fine- to medium-grained marine sandstone. The lower portions of the Pictured Cliffs Sandstone represent a transitional sequence between this formation and the underlying Lewis Shale as indicated by alternating thin beds of very fine-grained sandstone and silty shale. The Pictured Cliffs Sandstone forms a capstone on an exposed cliff face located between the plant site and the CCR units located to the west (i.e., the Lined Ash Impoundment [LAI], Lined Decant Water Pond [LDWP] and the Dry Fly Ash Disposal Area [DFADA]).

- *Lewis Shale:* The Lewis Shale is a marine shale that contains evaporite deposits resulting in naturally-occurring saline groundwater conditions. The Lewis Shale is the uppermost geologic unit that underlies the LAI, LDWP, and DFADA and spans west of the Pictured Cliffs Sandstone cliff face approximately 1.5 miles westward to the base of the Hogback Monocline. The regional thickness of the Lewis Shale is approximately 500 ft and is underlain by Cliff House Sandstone. The Lewis Shale consists of a weathered shale subunit overlying a hard, unweathered shale subunit. The thickness of the weathered shale varies between 11 and 47 ft with an average thickness of 30 ft within the vicinity of the Site (Dames & Moore, 1988). The weathered shale is not as thick when overlain by Pictured Cliffs Sandstone in the vicinity of the plant site. This subunit contains thin sandstone lenses that vary in thickness from 1 to 7 ft; the sandstone is fine- to very fine-grained and cemented by calcium carbonate (Dames & Moore, 1988).

The unweathered shale is significantly less permeable than the weathered shale. The unweathered shale is very fine-grained to silty and contains periodic siltstone and sandstone lenses (Dames & Moore, 1988). The surface of the unweathered shale slopes towards the Chaco Wash at approximately the same slope as land surface (Dames & Moore, 1988) but displays some irregularity resulting in varying levels of saturated thickness in the weathered shale. The Lewis Shale is variably saturated and hydraulically interconnected with alluvial deposits of Chaco Wash. The low-permeability unweathered shale underlying the Pictured Cliffs Sandstone results in a perched saturated zone beneath the plant.

Applicable Hydrostratigraphy. Three general hydrostratigraphic units are conceptualized beneath the FCPP and associated CCR units. These units form the basis for the Conceptual Site Model (CSM) developed by AECOM (2017) for the purpose of designing the site CCR groundwater monitoring system and establish the working basis for statistically evaluating groundwater conditions underlying the Site.

The first hydrostratigraphic unit (Pictured Cliffs Sandstone) is dominant only under the plant area, which is located in an elevated area south of Morgan Lake (Figure 1-2). Two CCR units (i.e., the URS and CWTP) reside within this area. The Pictured Cliffs Sandstone is the uppermost water bearing unit for the plant area and extends from ground surface (between approximately 5,340 to 5,360 ft amsl) to approximately 5,300 ft amsl in the plant area. Groundwater in this area is strongly influenced by Morgan Lake (at a surface elevation of approximately 5,330 ft amsl) and generally flows northward towards the lake. However, construction and operations of the plant have resulted in disturbed ground conditions and associated impacts are not well understood.

The second hydrostratigraphic unit (Weathered Lewis Shale/Alluvium) underlies the Pictured Cliffs Sandstone in the plant area and the Multiunit 1/DFADA CCR units in the disposal area, approximately 1 mile west of the plant (Figure 1-2). The Weathered Lewis Shale and the hydraulically connected alluvial deposits along Chaco Wash are designated as the uppermost water bearing unit in the disposal area. Although the Lewis Shale is geologically continuous in this area, it is unsaturated in the vicinity of the DFADA. The water table in the Weathered Lewis Shale can exhibit local seasonal fluctuations that are attributed to interactions between rates of groundwater recharge and discharge (Dames & Moore, 1988) from/to Morgan Lake, historical unlined ponds, and Chaco Wash. Groundwater flow generally follows the surface topography and descends to the west-southwest in the disposal area, mainly in the weathered shale and in local alluvial channels that drain toward the Chaco Wash (APS, 2013).

The third hydrostratigraphic unit (Unweathered Lewis Shale) consists of the Unweathered Lewis Shale and is a regionally extensive confining unit that forms the base of the uppermost aquifers in the plant and disposal areas.

Ambient Groundwater Quality. APS began evaluating groundwater and the hydrogeology in the area of the Plant as early as 1971. Due to the natural heterogeneity of the geologic and hydrogeologic conditions underlying the FCPP, background constituent concentrations are expected to be spatially heterogeneous (varying) across the Site. The Site is also expected to exhibit both spatial and temporal heterogeneity attributable to local climatic regimes, potential leakage from Morgan Lake, and potential operational activity at the Site.

1.2 Basis for Hydrogeological Investigation

1.2.1 CCR Groundwater Monitoring Compliance

The groundwater monitoring and corrective action process defined in the CCR Rule includes a phased approach to groundwater monitoring for each CCR unit:

- Detection Monitoring: This groundwater monitoring phase focuses on a set of constituents (listed in Appendix III of the CCR Rule) that are relatively mobile components of CCR and therefore represent indicators of possible impacts from CCR in groundwater. If statistically significant increases (SSIs) of any of the Appendix III constituents relative to background conditions are detected in the downgradient waste boundary wells and cannot be demonstrated to be associated with a source other than the CCR unit, then groundwater monitoring moves into assessment monitoring.

- Assessment Monitoring: This groundwater monitoring phase focuses on the constituents listed in Appendix IV of the CCR Rule. The Appendix IV constituents are generally less mobile and occur at lower concentrations in groundwater than the Appendix III constituents. Concentrations of Appendix IV constituents in downgradient wells are compared to Groundwater Protection Standards (GWPSs). The GWPSs, established for Appendix IV constituents only, are the higher of either the federal Safe Drinking Water Act Maximum Contaminant Level (MCL), an alternative risk-based GWPS identified in the CCR Rule, or a statistically-driven background threshold value for each constituent.

- Groundwater Characterization and Corrective Action Assessment: If exceedances of the GWPSs are determined to be occurring in the downgradient boundary wells at statistically significant levels and no alternative sources for the exceedances can be demonstrated, then both additional groundwater characterization and assessment of corrective actions are initiated. Following assessment of corrective measures, a remedy (or set of remedial activities) is selected and implemented as the groundwater corrective action program for the CCR unit. According to the CCR Rule, groundwater corrective action will continue until compliance with the GWPSs has been attained in all impacted wells and sustained for a period of three consecutive years.

1.2.2 Statistical Assessment of Collected Groundwater Data

APS initiated CCR groundwater detection monitoring at FCPP in November 2015 and completed collection of at least eight initial rounds of monitoring at all wells in October 2017 in accordance with the CCR Rule. Statistical analysis of Appendix III constituent data collected during detection monitoring was completed in January 2018 and concluded that there is enough evidence to declare an SSI over background for one or more Appendix III constituents at both the URS and Multiunit 1 (Amec Foster Wheeler Environment & Infrastructure, Inc., August 2018). On the basis of this analysis, assessment monitoring was initiated at the subject units and a statistical evaluation of Appendix IV constituent monitoring data was conducted. Table 1-3 summarizes calculated GWPSs and identifies constituents and wells at which exceedances over GWPSs have been reported. As indicated, there was sufficient evidence to declare a statistically significant level (SSL) of fluoride that exceeded the GWPS downgradient of the URS (Wood, 2018a) and SSLs of cobalt and molybdenum concentrations downgradient of Multiunit 1 (Wood, 2018b). These constituents are herein referred to as the Constituents of Concerns of the subject investigation.

1.2.3 Conceptual Site Model

To characterize the nature and extent of fluoride downgradient of the URS and cobalt and molybdenum downgradient of Multiunit 1, unit-specific CSMs were developed prior to initiating the hydrogeological investigation documented herein. These preliminary CSMs are summarized as follows:

1.2.3.1 CSM for the URS

- The URS is located in the southern portion of the plant area (Figure 1-2) which is underlain by the Pictured Cliffs Sandstone hydrostratigraphic unit. Based on the results of groundwater monitoring

conducted as part of CCR compliance activities, the predominant direction of groundwater flow in the Pictured Cliffs Sandstone hydrostratigraphic unit is towards Morgan Lake.

- The URS was a surge pond for process water associated with the plant's flue gas desulfurization (FGD) system. The URS was placed in service around 1983 (Table 1-1) and removed from service on December 10, 2018 when a new concrete tank was connected to operations to assume the function of the URS. The process water discharged to the URS contained elevated levels of fluoride. The pond was approximately 1 acre in size and was lined with soil cement on the bottom and on the inside slopes of the pond. The level in the pond varied with operation of the FGD system.

- Prior to demolition of the unit, groundwater levels were locally elevated in the vicinity of the URS suggesting that the URS was in hydraulic communication with underlying groundwater. Groundwater monitoring conducted in November 2018 (after most of the URS had been drained) indicated that the extent of mounding under the URS was limited and had declined from levels observed while the sump was in operation (Wood, 2019).

- The highest concentrations of fluoride in the vicinity of the URS are generally associated with wells that are hydraulically downgradient of the CCR unit (i.e., MW-66 and MW-67), although fluoride concentrations in upgradient well MW-69 and cross-gradient well MW-68 are elevated above the fluoride GWPS.

- APS initiated activities to prepare for closure of the URS in June 2018. Activities included construction of a new above-ground replacement tank (the URT), draining of the URS, and demolition of the URS with over excavation of underlying soils. A notice of intent to initiate closure of the URS was published on December 10, 2018.

- The URT was constructed from August 2018 to November 2018. A temporary cofferdam was constructed in the southwest corner of the old URS footprint to constrain flows and allow demolition of the URS and construction of the new URT while the FGD system continued to function. The cofferdam remained in use until December 10, 2018, at which point all inflow to the old URS was halted and diverted to the URT.

1.2.3.2 CSM for Multiunit 1

- Multiunit 1 is comprised of the LAI and the LDWP. The LAI receives fly ash, FGD waste, and associated residuals as a slurry from the plant; decanted water from the LAI is discharged to the LDWP where it is allowed to evaporate over time or reused in plant operations.

- Multiunit 1 is located in the disposal area approximately 1 mile west of the plant (Figure 1-2). Multiunit 1 was placed into service in 2004 and constructed on top of closed Ash Ponds 3, 4, and 5. Multiunit 1 is adjacent to other active and closed CCR facilities including the DFADA to the south, closed Ash Pond 6 to the north, and the closed facility Evaporation Ponds to the west.

- The hydrostratigraphic unit directly underlying Multiunit 1 is the Weathered Lewis Shale/Alluvium. Groundwater flow in this unit generally follows the surface topography and descends to the west-southwest towards Chaco Wash.

- The only downgradient CCR wells associated with Multiunit 1 indicating SSLs over GWPSs were MW-61 and MW-75 (Figure 1-2). There is limited area available between these wells and the closed Evaporation Ponds to the west for investigation efforts.

- APS currently operates a groundwater intercept trench system downgradient of the closed Evaporation Ponds. An extensive and existing groundwater monitoring network is associated with this intercept trench system which can be used to evaluate the nature and extent of cobalt and molybdenum in the region downgradient of Multiunit 1.

2.0 Description of Investigation Activities

Previous characterization efforts conducted at the Site have facilitated development of the CSMs for Multiunit 1 and the URS and helped guide the investigation activities documented herein. This hydrogeological investigation was conducted in accordance with the *Well Installation and Sampling Work Plan* for the FAP (Wood 2018a) and is intended to meet groundwater characterization requirements for CCR units in the assessment monitoring stage, as specified in 40 CFR §257.95(g)(1).

2.1 Well Installation Activities

This section provides a description of well installation activities, including boring logs and well construction diagrams, a well location map, and a well construction table. Boring logs and well construction diagrams are included in Appendix A, and photographs of formation samples are presented in Appendix B.

2.1.1 Well Location and Purpose

Five new groundwater monitoring wells were installed during the investigation to promote characterization of the nature and extent of fluoride concentrations downgradient of the URS (i.e., MW-83, MW-84, MW-85, and MW-86) and cobalt and molybdenum concentrations downgradient of Multiunit 1 (i.e., MW-87). Figure 1-2 presents the location of these wells relative to other site infrastructure. More specific information regarding the location and purpose of each well is as follows:

- MW-83 is located on the north end of the plant area adjacent to Morgan Lake and north of the Navajo mine coal piles. This well is considered a facility boundary well located in the direction of likely contaminant migration to satisfy the requirement of 40 CFR §257.95(g)(1)(iii).

- MW-84 is located on the northwestern corner of the Urea to Ammonia building of the power plant. This well was sited to define the downgradient extent of fluoride concentrations above the GWPS of 4 milligrams per liter (mg/L) in groundwater near the URS.

- MW-85 is located on the southeast of the Slurry Underflow building of the power plant. This well was sited to define the western lateral extent of fluoride concentrations above the GWPS near the URS.

- MW-86 is located south of the coal conveyor system in the coal plant area on property managed by the North American Coal-Bisti Fuels Company property. This well was sited to define the eastern lateral extent of fluoride concentrations above the GWPS near the URS.

- MW-87 is located on the western edge of the lease boundary, approximately 1/2-mile west-southwest of the LDWP. This well is considered a facility boundary well located in the direction of likely contaminant migration to satisfy the requirement of 40 CFR §257.95(g)(1)(iii).

2.1.2 Borehole Advancement

Wood contracted a licensed New Mexico driller, Cascade Drilling, LP, to advance the monitoring wells using a truck-mounted Sonic drill rig powered with a diesel engine. Continuous samples were inspected by a

Wood field geologist at 2.5-ft depth intervals to log soils using the Unified Soil Classification System. Photos of the formation samples from the wells are presented in Appendix B.

Where present, the depth at which groundwater was initially observed was measured and recorded. During drilling operations in MW-83, MW-85, and MW-87, groundwater was not encountered nor observed. Water was encountered in MW-84 at 15 ft below ground surface (bgs) and in MW-86 at 25 ft bgs. Initial water level measurements are summarized in the boring logs presented in Appendix A.

2.1.3 Well Installation

The monitoring wells were installed between November 16 and November 21, 2018. The wells were designed similarly to existing CCR wells at the Site. Well materials for each well consist of a 4-inch nominal diameter Schedule 80 polyvinyl chloride (PVC) well casing and a 4-inch nominal diameter Schedule 80 PVC well screen with 0.020-inch slots. Filter pack material consists of 8-12 silica sand. Bentonite chips were placed above the filter pack and the surface seal consists of cement grout. Surface completions consist of either a 2-ft above-ground steel vault in a concrete pad with traffic bollards surrounding the well or a flush-mount surface completion in a concrete pad with no bollards.

With the exception of MW-87 (which is screened within the Weathered Lewis Shale), the wells are screened within the Pictured Cliffs Sandstone near the contact with the underlying Weathered Lewis Shale. Screened intervals for the wells range from 15 to 20 ft and construction details of each well are presented in Table 1-2.

2.1.4 Well Development

The new monitoring wells were developed using purging, bailing, and pumping techniques on December 3 through December 6, 2018. MW-87 was not developed because it was dry at the time of attempted development. The development techniques used at each well depended on the volume of water produced by each well; however, the following is a general summary of the development process:

- A 1.5-gallon bailer was used to remove residual sediment in the well.
- The well was pumped with a Mega Monsoon submersible pump until turbidity measurements fell below 10 nephelometric turbidity units (NTUs).
- Pumping rates achieved during development ranged from a minimum of 0.125 gallons per minute (gpm) at MW-83 to a maximum of 3.75 gpm at MW-84.
- The total volumes of groundwater removed from the wells during pump development activities ranged between 25 and 290 gallons.

Development was considered complete when water turbidity measurements from each well reached less than 10 NTUs, as measured with an electronic turbidimeter. Table 2-1 summarizes the development activities for each well.

2.1.5 Management of Investigation-Derived Waste

Investigation-derived waste included soil cores generated during boring advancement and groundwater pumped during well development.

Soil cores generated during drilling were placed on plastic sheeting. Excess soil cuttings were temporarily placed in a self-dumping trailer adjacent to the drill rig. After the soil cores had been logged and

photographed by the Wood geologist, the cores and excess cuttings were placed in the DFADA for disposal. A total of 2.5 cubic yards of soil waste was generated from borehole advancement.

Groundwater pumped from the monitoring wells during development was directed to 55-gallon drums, which were emptied into the URT at the end of each day.

2.1.6 Well Survey

The location, surface elevation, and top of casing elevation of the new wells were surveyed on December 18, 2018 by a registered land surveyor (New Mexico). Figure 1-2 presents the surveyed well locations. Survey details are summarized in Table 1-2 and the complete survey results are included in Appendix C.

2.2 Groundwater Sampling

APS conducted groundwater sampling at CCR and supplemental site monitoring wells on December 15 through 17, 2018. Groundwater sampling was conducted according to the Sampling and Analysis Plan presented in the *Annual Groundwater Monitoring and Corrective Action Report for 2017* (Amec Foster Wheeler, 2018). The samples were analyzed by TestAmerica, an Arizona Department of Health Services certified environmental laboratory (AZ0728). The December 2018 sampling provided information to allow for definition of the extent of elevated concentrations of CCR constituents in groundwater. Results are shown in Tables 2-2 and 2-3 for the URS and Multiunit 1, respectively. Laboratory reports and data validation reports are provided in Appendix D.

3.0 Evaluation of Collected Investigation Data

The evaluation and discussion that follows relies on data collected in December 2018 as well as data collected during regularly-scheduled monitoring associated with CCR units under the CCR Rule. The data specific to the regularly-scheduled monitoring are included in the *Annual Groundwater Monitoring and Corrective Action Report for 2018* (Wood, 2019) and the results, while used to inform the delineation of CCR constituents shown in Figures 2-1 through 2-3, are not duplicated here.

3.1 Upper Retention Sump

3.1.1 Notable Hydrogeologic Conditions Encountered During Investigation

Hydrogeologic conditions encountered at each well during well installation activities are outlined below:

- MW-83: Of the four wells drilled to investigate impacts at the URS, this well is closest to Morgan Lake. The lithologic log noted sand mixed with fly ash in the upper 10.5 ft, followed by approximately 5 ft of silty sand. Weathered sandstone was encountered from 15.5 to 30 ft bgs, and weathered shale was present from 30 ft bgs to the total depth of the borehole at 35 ft bgs. Groundwater was not encountered during borehole advancement, suggesting a low hydraulic conductivity of the formation and a potentially limited hydraulic connection between Morgan Lake and this well.

- MW-84: This well is located directly downgradient of the elevated concentrations of fluoride underlying the URS based on the inferred direction of groundwater flow. The lithologic log noted fly ash and sandy clay in the upper 9.5 ft, followed by sandstone interbedded with lenses of sandy clay from 9.5 to 30 ft bgs. Weathered shale was encountered from 30 ft bgs to the total depth of the borehole at 35 ft bgs. Groundwater was encountered in the sandstone at 15 ft bgs directly above a 3-ft-thick layer of sandy clay.

- MW-85: This well is located down- to cross-gradient from the elevated concentrations of fluoride underlying the URS. The lithologic log noted asphaltic concrete and sandy clay with gravel above sandstone at 4 ft bgs. Traces of iron-oxide and calcium carbonate were encountered at 8 and 14.5 ft bgs, respectively. A sandy clay lens was encountered between 21.5 and 23.5 ft bgs, and weathered shale was encountered from 31 ft bgs to the total depth of the borehole at 35 ft bgs. Groundwater was not encountered during borehole advancement.

- MW-86: This well is located on the Navajo Mine lease area and is down- to cross-gradient from the elevated concentrations of fluoride underlying the URS. The lithologic log noted a mixture of fine coal and sandy clay with gravel at the surface, followed by sandstone encountered at 4.5 ft bgs. Weathered shale was encountered from 17.5 to 24 ft bgs; lenses of weathered shale, sandstone, and sand & clay mixtures continue to the total depth of the borehole at 35 ft bgs. Groundwater was encountered in the sandstone at 25 ft bgs, directly above a 5-ft thick layer of sand and clay.

Based on the lithologic logs and well development, notable conditions include:

- CCR and previously disturbed surface soils were noted in shallow intervals at MW-83 and MW-84.

- An apparent correlation between relatively high development pumping rates and the presence of sandy clay and sand deposits in MW-84 and MW-86, respectively, suggesting that groundwater may preferentially flow within the more permeable strata underlying the plant area.

3.1.2 Nature and Extent of Release

Analytical results from groundwater samples collected from the site monitoring wells noted in Section 2.2 were used to evaluate the extent of fluoride concentrations over the GWPS in groundwater at the URS. Figure 2-1 depicts the inferred footprint of elevated fluoride concentrations in groundwater beneath the URS using an iso-concentration contour. The iso-concentration contour is defined by the fluoride GWPS and the depicted fluoride footprint is inferred from the analytical data collected in November/December 2018.

The results indicate that fluoride concentrations in groundwater are elevated above the GWPS beneath the URS but do not appear to extend beyond the immediate vicinity. The inferred groundwater flow direction is to the northwest, and the lateral extent of elevated fluoride in groundwater appears to be defined by new wells MW-84, MW-85, and MW-86, as none of the groundwater samples collected from these wells indicated fluoride concentrations above the laboratory reporting limit of 0.8 mg/L.

3.1.3 Potential for Off-Site Migration of Contamination

As described in the CSM for the URS and depicted on the iso-concentration map for fluoride (Figure 2-1), the highest concentrations of this constituent are generally associated with wells that are hydraulically downgradient of the CCR unit (i.e., MW-66 and MW-67), although fluoride concentrations in upgradient well MW-69 and cross-gradient well MW-68 are also elevated above the GWPS. The inferred direction of groundwater flow at the URS is towards the northwest to Morgan Lake, which discharges to No Name Wash downstream of the dam where it exits the APS lease boundary. However, the data indicate that no off-site migration of groundwater with elevated fluoride concentrations has occurred, and the limited lateral extent of elevated fluoride concentrations in the URS monitoring well network suggests that the relatively low hydraulic conductivity of the Pictured Cliffs Sandstone is impeding the downgradient migration of fluoride from the unit. The URS was placed into service in 1983 and decommissioned in December 2018. In the 35

years the URS functioned as a surge pond for the FGD system, the impacts from the historical discharge have migrated less than 400 ft downgradient from the footprint of the former URS.

3.2 Multiunit 1

3.2.1 Notable Hydrogeologic Conditions Encountered During Investigation

Hydrogeologic conditions encountered at MW-87 during well installation activities are outlined below:

- MW-87: This well is located at the western boundary of the APS lease area, approximately 150 ft east of Chaco Wash. The lithologic log noted unconsolidated formation materials (sand, silty sand, and clayey silt) in the top 21 ft, after which damp Weathered Lewis Shale was encountered. The Weathered Lewis Shale was damp to moist at 27.5 ft bgs, and damp from 34 to 44 ft bgs. Unweathered Lewis Shale was encountered at 44 ft bgs to the total depth of the borehole at 50 ft bgs. No groundwater was encountered during borehole advancement. No notable formation conditions were encountered that would change/inform the CSM as described.

3.2.2 Nature and Extent of Release

Analytical results from groundwater samples collected from the site monitoring wells noted in Section 2.2 were used to evaluate the extent of molybdenum and cobalt concentrations in groundwater downgradient of Multiunit 1. Figures 2-2 and 2-3 depict the inferred footprints of elevated molybdenum and cobalt concentrations in groundwater at Multiunit 1, respectively. The iso-concentration contours shown on the figures are defined by the respective GWPSs and the depicted footprints are inferred from the analytical data collected in November/December 2018.

During the November/December 2018 sampling event, molybdenum was detected at concentrations above the GWPS of 0.1 mg/L in CCR downgradient monitoring wells MW-61 (0.10 mg/L) and MW-75 (0.17 mg/L). The data indicate that the southern extent of the elevated molybdenum concentrations is defined by monitoring wells MW-8 and MW-38R, respectively (Figure 3-1). The northern extent of elevated molybdenum in groundwater was inferred using limited information available at the time of this report. Additional data collection at wells in this area is warranted to better define the northern extent of elevated molybdenum in groundwater. Molybdenum was not detected above the laboratory reporting limit of 0.01 mg/L in supplementary monitoring wells MW-17R, MW-38R, or MW-16, all located downgradient of the Multiunit 1 boundary and upgradient of APS's Southern Intercept Trench (SIT), an engineering control installed to intercept groundwater before it flows off-site. The results from the December 2018 monitoring event indicate that impacts from molybdenum are limited in extent to an area immediately downgradient of the LDWP.

Cobalt was detected in concentrations above the GWPS of 0.01 mg/L in CCR downgradient monitoring wells MW-61 (0.018 and 0.022 mg/L in November and December 2018, respectively) and MW-75 (0.045 and 0.046 mg/L in November and December 2018, respectively). Cobalt was also detected in supplemental wells MW-17R (0.091 mg/L) and MW-38R (0.093 mg/L). Cobalt was not detected above the laboratory reporting limits of 0.00050 and 0.010 mg/L at wells MW-8 and MW-16, respectively, indicating the southern extent of the elevated cobalt concentrations is defined at these wells. The northern extent of the elevated cobalt concentrations in groundwater was inferred using limited information available at the time of this report. Additional data collection in this area is warranted, although water quality north of Multiunit 1 is expected to be impacted by closed Ash Pond 6. Notably, cobalt was not detected above the laboratory reporting limit of 0.01 mg/L in the supplemental monitoring wells downgradient of the SIT.

3.2.3 Potential for Off-Site Migration of Contamination

The inferred direction of groundwater flow at Multiunit 1 is generally to the west-southwest, with localized areas where groundwater flow occurs more southwesterly. Off-site migration of contamination could occur if groundwater containing elevated concentrations of molybdenum and/or cobalt flowed to the APS lease boundary and beyond. However, as noted in Section 3.2.2, APS has constructed the SIT to intercept groundwater before it flows off-site. The results of the November/December 2018 monitoring event indicate that the SIT is effectively capturing impacted groundwater before it migrates from the Site. However, analytical data from a March 2019 sampling event at new CCR well MW-87 (located downgradient of the SIT) indicate cobalt concentrations that exceeded the GWPS (Table 2-3). MW-87 was not sampled during the November/December 2018 sampling event because it was dry, and the presence of water in this well could be correlated to flow in Chaco Wash, which may contain impacted surface water resulting from coal mining activities in the Chaco Wash drainage basin. Therefore, the elevated cobalt concentrations observed at MW-87 may be caused by the influence of impacted surface water at this well. Further investigation is warranted to determine the cause of the observed water quality at MW-87.

4.0 References

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TABLES

Table 1-1
Description of Coal Combustion Residual Units

CCR Unit	Location	Function	Operation	Size/Construction	History
Upper Retention Sump (URS)	*Plant Area* NW1/4 of Section 36, T29N, R16W	*Single CCR unit* . Impoundment. Surge pond for FGD system.	FGD system discharge is discharged into the sump via 10 plus controlled/monitored lines. Pond contents are recirculated back into the FGD process via a pump chamber located on the south end of the pond. Solids are periodically removed from the sump.	- 1.07 acres in areal extent - Soil-cement liner on bottom and inside slopes	Placed in service around 1983.
Combined Waste Treatment Pond (CWTP)	*East of Plant, Adjacent to Morgan Lake* SE1/4 of Section 25, T29N, R16W	*Single CCR Unit* . Impoundment. Detention pond used as a settling and stabilization basin for ash-impacted and other Plant wastewater flows prior to discharge to Morgan Lake in accordance with an NPDES permit.	The primary source of water to the CWTP is from hydrobins which separate transport water from bottom ash generated in plant Units 4 and 5. Seven earthen basins in the western edge of the CWTP promote sediment settling prior to the water decanting into the main portion of the CWTP and then overflowing into the cooling water discharge canal at the northeast corner of the pond.	- 13.7 acres in areal extent	Constructed in 1978.
Lined Ash Impoundment (LAI)	*Disposal Area* E1/2 of Section 34, T29N, R16W	*Part of a CCR multiunit with the LDWP* that receives fly ash, flue gas desulfurization (FGD) waste and associated residuals as a slurry from the plant. Impoundment.	Waste is discharged into the pond in the northeast portion of the pond. Decanted flow discharges via a vertical drop structure through a toe drain into the LDWP.	- 75 acres in areal extent - 60 mil HDPE liner - 5,364 acre-ft design capacity - 5,275.2 ft AMSL maximum working level	Constructed on top of closed Ash Ponds 4 and 5 and placed in service in 2004.
Lined Decant Water Pond (LDWP)	*Disposal Area* E1/2 of Section 34, T29N, R16W	*Part of a CCR multiunit with the LAI* that receives decanted water from the LAI. Impoundment.	Decanted water is discharged into the LAI via gravity; the water is pumped from the LDWP back to the plant for reuse in operations.	- 45 acres in areal extent - Two 60 mil HDPE liners separated by a leak detection layer - 435 acre-ft design capacity - 5,213.2 ft AMSL maximum working level	Constructed on top of closed Ash Pond 3 and placed in service in 2003.
Dry Fly Ash Disposal Area (DFADA)	*Disposal Area* SE1/4 of Section 34, T29N, R16W	*Single CCR unit* . Landfill. Disposal of dry fly ash, bottom ash, and construction debris. In the future, FGD solids will be mixed with fly ash at the plant and landfilled in the DFADA.	The DFADA is filled in general accordance with a stacking plan. Leachate generated from the DFADA cells is pumped into trucks and used for dust control or can be transferred to the LDWP.	- 3 conjoined cells (DFADA 1, 2, and 3) with areal extents of 37 acres, 32 acres, and 15 acres, respectively - 3,125 acre-ft design capacity - DFADA 1: compacted clay overlain by 60 mil HDPE liner and drainage layer - DFADA 2 and 3: geosynthetic clay liner overlain by 60 mil HDPE liner and drainage layer - Leachate collection system drains each DFADA cell - DFADA 4 is planned but not yet constructed	Constructed in 2007 (DFADA 1), 2012 (DFADA 2), and 2014 (DFADA 3).

Notes:

AMSL - above mean sea level
CCR - Coal combustion residuals
CWTP - Combined Waste Treatment Pond
DFADA - Dry Fly Ash Disposal Area
FGD - flue gas desulfurization
ft - feet
HDPE - high density polyethylene
LAI - Lined Ash Impoundment
LDWP - Lined Decant Water Pond
NPDES - National Pollutant Discharge Elimination System
URS - Upper Retention Sump

Table 1-2
CCR Groundwater Monitoring System and New Well Construction Summary

Well	CCR Unit	Well Designation	Hydrogeologic Unit	Date Installed	Borehole Depth (ft bgs)	Top of Casing Elevation (ft amsl)	Ground Surface Elevation (ft amsl)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Screen Length (ft)	Top Screen Elevation (ft amsl)	Bottom Screen Elevation (ft amsl)	Bottom Borehole Elevation (ft amsl)
MW-66	URS	Downgradient	Pictured Cliffs Sandstone	9/27/2015	33	5,344.69	5,344.7	15	25	10	5,329.7	5,319.7	5,311.7
MW-67	URS	Downgradient	Pictured Cliffs Sandstone	9/11/2015	31	5,356.42	5,354.0	19.6	29.6	10	5,334.4	5,324.4	5,323.0
MW-68	URS	Downgradient	Pictured Cliffs Sandstone	9/10/2015	30	5,353.58	5,354.0	19	29	10	5,335.0	5,325.0	5,324.0
MW-69	URS	Downgradient	Pictured Cliffs Sandstone	9/9/2015	35	5,357.66	5,355.3	24.3	34.3	10	5,331.0	5,321.0	5,320.3
MW-70	URS	Downgradient	Pictured Cliffs Sandstone	9/30/2015	53	5,371.12	5,368.6	40	50	10	5,328.6	5,318.6	5,315.6
MW-83	URS	Downgradient	Pictured Cliffs Sandstone	11/29/2018	35	5,343.15	5,341.51	14	29	15	5,327.51	5,312.51	5,306.51
MW-84	URS	Downgradient	Pictured Cliffs Sandstone	11/18/2018	35	5,338.23	5,339.34	10	30	20	5,329.34	5,309.34	5,304.34
MW-85	URS	Downgradient	Pictured Cliffs Sandstone	11/18/2018	35	5,352.78	5,353.69	15	30	15	5,338.69	5,323.69	5,318.69
MW-86	URS	Downgradient	Pictured Cliffs Sandstone	11/17/2018	35	5,338.76	5,338.74	10	30	20	5,328.74	5,308.74	5,303.74
MW-71	URS/CWTP	Background	Pictured Cliffs Sandstone	3/12016	50	5,362.91	5,363.6	22.5	42.5	20	5,341.1	5,321.1	5,313.6
MW-72	URS/CWTP	Background	Pictured Cliffs Sandstone	3/2/2016	61	5,381.62	5,379.1	50.7	60.7	10	5,328.4	5,318.4	5,318.1
MW-73	URS/CWTP	Background	Pictured Cliffs Sandstone	1/18/2017	45	5,353.95	5,351.9	28.9	43.9	15	5,323.0	5,308.0	5,306.9
MW-62	CWTP	Downgradient	Pictured Cliffs Sandstone	9/28/2015	20	5,341.87	5,339.4	10	20	10	5,329.4	5,319.4	5,319.4
MW-63	CWTP	Downgradient	Pictured Cliffs Sandstone	9/25/2015	20	5,337.02	5,337.0	9	19	10	5,328.0	5,318.0	5,317.0
MW-64	CWTP	Downgradient	Pictured Cliffs Sandstone	9/26/2015	25	5,337.66	5,337.7	10	20	10	5,327.7	5,317.7	5,312.7
MW-65	CWTP	Downgradient	Pictured Cliffs Sandstone	9/27/2015	20	5,339.74	5,337.2	8	18	10	5,329.2	5,319.2	5,317.2
MW-7	Multiunit 1	Downgradient	Lewis Shale	3/11/1987*	60	5,149.32	5,148.3	14.7	34.7	20	5,133.6	5,113.6	5,088.3
MW-8	Multiunit 1	Downgradient	Lewis Shale	3/11/1987*	74	5,122.56	5,120.9	28	48	20	5,093.2	5,073.2	5,046.9
MW-40R	Multiunit 1	Downgradient	Lewis Shale	9/17/2015	25	5,137.43	5,134.8	14.3	24.3	10	5,120.5	5,110.5	5,109.8
MW-43	Multiunit 1	Background	Lewis Shale	3/24/2012	60	5,271.58	5,269.4	16	26	10	5,253.4	5,243.4	5,209.4
MW-49A	Multiunit 1	Background	Lewis Shale	5/18/2013	68	5,285.83	5,281.4	50	65	15	5,231.4	5,216.4	5,213.4
MW-50A	Multiunit 1	Background	Lewis Shale	5/7/2013	63	5,335.97	5,333.2	28	43	15	5,305.2	5,290.2	5,270.2
MW-51	Multiunit 1	Background	Lewis Shale	4/28/2013	80	5,288.14	5,285.1	20	30	10	5,265.1	5,255.1	5,205.1
MW-61	Multiunit 1	Downgradient	Lewis Shale	9/16/2015	35	5,129.19	5,126.6	24.2	34.2	10	5,102.4	5,092.4	5,091.6
MW-74	Multiunit 1	Background	Lewis Shale	1/18/2017	40	5,219.09	5,216.7	8.1	18.1	10	5,208.6	5,198.6	5,176.7
MW-75	Multiunit 1	Downgradient	Lewis Shale	3/15/2017	41	5,126.80	5,124.8	29.0	39.0	10	5,095.8	5,085.8	5,083.8
MW-76	Multiunit 1	Downgradient	Lewis Shale	3/16/2017	33	5,116.23	5,114.3	11.8	26.8	15	5,102.5	5,087.5	5,081.3
MW-87	Multiunit 1	Downgradient	Lewis Shale	11/28/2018	50	5,076.53	5,074.29	15	45	30	5,059.29	5,029.29	5,024.29
MW-10	DFADA	Downgradient	Lewis Shale	3/12/1987	35	5,150.71	5,149.7	13	33	20	5,136.7	5,116.7	5,114.7
MW-12R†	DFADA	Background	Lewis Shale	3/27/2012	70	5,264.44	5,261.7	13.5	33.5	20	5,248.2	5,228.2	5,191.7
MW-12R1**	DFADA	Background	Lewis Shale	4/10/2018	40	5,270.12	5,268.2	22	32	10	5,246.2	5,236.2	5,228.2
MW-13	DFADA	Downgradient	Lewis Shale	8/31/1987	60	5,150.75	5,149.5	34.9	54.9	20	5,114.6	5,094.6	5,089.5
MW-44	DFADA	Downgradient	Lewis Shale	3/28/2012	40	5,146.89	5,145.2	13.5	23.5	10	5,131.7	5,121.7	5,105.2
MW-48	DFADA	Downgradient	Lewis Shale	5/14/2013	80	5,165.96	5,163.4	35	60	25	5,128.4	5,103.4	5,083.4
MW-55R	DFADA	Background	Lewis Shale	9/13/2015	95	5,243.96	5,241.4	72.9	92.9	20	5,168.5	5,148.5	5,146.4

Notes:

Source of presented information presented is AECOM, 2017; AECOM, 2018; Sakura Engineering & Surveying, 2018 and 2019

Vertical datum is NAVD 88

Wells installed as part of this investigation are highlighted

* - estimated
† - abandoned
** - replacement well for MW-12R

amsl - above mean sea level
bgs - below ground surface

CCR - coal combustion residual(s)
CWTP - Combined Waste Treatment Pond
DFADA - Dry Fly Ash Disposal Area

ft - feet
URS - Upper Retention Sump

Table 1-3
Summary of Appendix IV Constituent Statistical Analyses

Constituent	URS				Multiunit 1			
	GWPS [mg/L]	Basis for GWPS	Location of SSI Over GWPS	Range of Exceeding LCLs [mg/L]	GWPS [mg/L]	Basis for GWPS	Location of SSI Over GWPS	Range of Exceeding LCLs [mg/L]
Antimony	0.01	BTV	None	---	0.01	BTV	None	---
Arsenic	0.013	BTV	None	---	0.01	US EPA MCL	None	---
Barium	2	US EPA MCL	None	---	2	US EPA MCL	None	---
Beryllium	0.004	US EPA MCL	None	---	0.004	US EPA MCL	None	---
Cadmium	0.005	US EPA MCL	None	---	0.005	US EPA MCL	None	---
Chromium	0.1	US EPA MCL	None	---	0.1	US EPA MCL	None	---
Cobalt	0.016	BTV	None	---	0.01	BTV	MW-61 and NW-75	0.016 to 0.043
Fluoride	4	BTV/ US EPA MCL	MW-66, MW-67, MW-68, and MW-69	11 to 26	5	BTV	None	---
Lead	0.015	Alternative Risk-Based GWPS	None	---	0.015	Alternative Risk-Based GWPS	None	---
Lithium	0.8	BTV	None	---	1.8	BTV	None	---
Mercury	0.002	US EPA MCL	None	---	0.002	US EPA MCL	None	---
Molybdenum	0.1	Alternative Risk-Based GWPS	None	---	0.1	Alternative Risk-Based GWPS	MW-75	0.15
Selenium	0.45	BTV	None	---	0.092	BTV	None	---
Thallium	0.002	US EPA MCL	None	---	0.017	BTV	None	---
Combined Radium	5.4	BTV	None	---	5	US EPA MCL	None	---

Notes:

BTV - Background Threshold Value
GWPS - Groundwater Protection Standard
LCL - Lower Confidence Limit
mg/L - milligrams per liter
SSI - statistically significant increase
US EPA MCL - United States Environmental Protection Agency Maximum Contaminant Level

Table 2-1
Well Development Summary

Well ID	Time Spent Developing Well (min)	Depth to Water before Development (ft bgs)	Final Depth of Well (ft bgs)	Pumping Rate during Development (gpm)	Total Volume Purged (gal)	Final Measured Water Turbidity (NTUs)	Comments
MW-83	310	13.73	31.07	0.125	67	7.9	Purged well very fast every 15 min to remove silt. Well is clean and recovery is slow when pumping.
MW-84	72	8.26	28.75	3.75	245	7.3	Development was quick and easy. Well is clean and had very little drawdown. Well produces a lot of water.
MW-85	43	22.58	28.75	0.15	25	4.1	Development was slow. Well is clean but has slow recovery.
MW-86	82	9.25	29.75	2.75	290	2.3	Well produces a lot of water. Development was easy.
MW-87	N/A	N/A	47.26	N/A	N/A	N/A	Well was dry when drilled - not developed.

Notes:

ft bgs - feet below ground surface
gal - gallons
gpm - gallons per minute
min - minute
NTUs - Nephelometric Turbidity Unit

Table 2-2
Water Quality Data Collected During Recent Groundwater Monitoring at the URS

			URS - Analyte Concentration by Location and Date					
			MW-66	MW-67	MW-68	MW-69	MW-70	MW-71
Analyte	**Units**	**GWPS**	**11/2/18**	**11/3/18**	**11/3/18**	**11/3/18**	**11/2/18**	**11/2/18**
Boron	mg/L	---	140	170	150	92	88	0.56
Calcium	mg/L	---	470	470	460	470	510	470
Chloride	mg/L	---	1800	2000	1500	1200	1100	520
pH	SU	---	7.3	7.4	7.2	7.3	7.0	7.0
Sulfate	mg/L	---	12000	13000	11000	8700	6400	11000
Total Dissolved Solids	mg/L	---	20000	19000	18000	14000	11000	16000
Antimony	mg/L	0.01	---	---	---	---	---	---
Arsenic	mg/L	0.013	0.0015	0.0016	0.0030	0.0042	0.0043	0.0046
Barium	mg/L	2	0.023	0.017	0.0081	0.012	0.010	0.0098
Beryllium	mg/L	0.004	---	---	---	---	---	---
Cadmium	mg/L	0.005	---	---	---	---	---	---
Chromium	mg/L	0.1	---	---	---	---	---	---
Cobalt	mg/L	0.016	0.012	0.0061	0.0038	0.0041	0.0041	<0.00050
Fluoride	mg/L	4	**25**	**16**	**12**	**11**	2.7	<2.0
Lead	mg/L	0.015	---	---	---	---	---	---
Lithium	mg/L	0.8	0.38	0.39	0.42	0.35	0.32	0.35
Mercury	mg/L	0.002	---	---	---	---	---	---
Molybdenum	mg/L	0.1	0.019	0.037	0.0078	0.012	0.0064	0.00079
Selenium	mg/L	0.45	0.0020	0.0043	0.11	0.025	0.19	0.27
Thallium	mg/L	0.002	0.0011	0.00078	0.0016	0.00024	0.00029	0.00031
Alkalinity as $CaCO_3$	mg/L	---	---	---	---	---	---	---
Alkalinity, Phenolphthalein	mg/L	---	---	---	---	---	---	---
Bicarbonate Alkalinity as $CaCO_3$	mg/L	---	---	---	---	---	---	---
Carbonate Alkalinity as $CaCO_3$	mg/L	---	---	---	---	---	---	---
Hydroxide Alkalinity as $CaCO_3$	mg/L	---	---	---	---	---	---	---
Magnesium	mg/L	---	---	---	---	---	---	---
Potassium	mg/L	---	---	---	---	---	---	---
SiO_2, Silica	mg/L	---	---	---	---	---	---	---
Sodium	mg/L	---	---	---	---	---	---	---

Notes:
Concentrations greater than the GWPS are bolded.

Acronymns:
AWQS = Aquifer Water Quality Standard
GWPS = Groundwater Protection Standard
mg/L = milligrams per liter
NS = no standard
SU = standard units
URS = Upper Retention Sump

Table 2-2
Water Quality Data Collected During Recent Groundwater Monitoring at the URS

			URS - Analyte Concentration by Location and Date					
			MW-72	MW-73	MW-83	MW-84	MW-85	MW-86
Analyte	**Units**	**GWPS**	**11/3/18**	**11/3/18**	**12/15/18**	**12/15/18**	**12/15/18**	**12/15/18**
Boron	mg/L	---	0.22	1.7	2.5	110	30	120
Calcium	mg/L	---	470	480	470	490	510	480
Chloride	mg/L	---	450	660	130	1400	680	1300
pH	SU	---	7.0	7.0	7.5	7.1	7.3	7.1
Sulfate	mg/L	---	11000	7500	3400	8300	5400	9400
Total Dissolved Solids	mg/L	---	16000	12000	5200	14000	8700	13000
Antimony	mg/L	0.01	---	---	<0.0025	<0.0025	<0.0025	<0.0025
Arsenic	mg/L	0.013	0.0031	<0.00050	<0.0010	<0.0010	0.0013	<0.0010
Barium	mg/L	2	0.0075	0.022	0.022	0.018	0.026	0.019
Beryllium	mg/L	0.004	---	---	---	---	---	---
Cadmium	mg/L	0.005	---	---	<0.00050	<0.00050	<0.00050	<0.00050
Chromium	mg/L	0.1	---	---	<0.0025	<0.0025	<0.0025	<0.0025
Cobalt	mg/L	0.016	0.0020	0.0078	0.0040	0.011	0.0017	0.0092
Fluoride	mg/L	4	<2.0	<0.80	1.8	<0.80	<0.80	<0.80
Lead	mg/L	0.015	---	---	<0.00050	0.00067	0.00058	0.00065
Lithium	mg/L	0.8	0.37	0.31	<0.20	<0.20	0.25	0.32
Mercury	mg/L	0.002	---	---	---	---	---	---
Molybdenum	mg/L	0.1	0.00078	0.0026	0.010	0.0015	0.0058	0.0041
Selenium	mg/L	0.45	0.13	0.0062	<0.0030	<0.0030	0.12	<0.0030
Thallium	mg/L	0.002	0.00088	0.00020	<0.00050	<0.00050	<0.00050	0.00053
Alkalinity as $CaCO_3$	mg/L	---	---	---	250	410	380	330
Alkalinity, Phenolphthalein	mg/L	---	---	---	<6.0	<6.0	<6.0	<6.0
Bicarbonate Alkalinity as $CaCO_3$	mg/L	---	---	---	250	410	380	330
Carbonate Alkalinity as $CaCO_3$	mg/L	---	---	---	<6.0	<6.0	<6.0	<6.0
Hydroxide Alkalinity as $CaCO_3$	mg/L	---	---	---	<6.0	<6.0	<6.0	<6.0
Magnesium	mg/L	---	---	---	270	1800	770	1700
Potassium	mg/L	---	---	---	3.2	33	18	30
SiO_2, Silica	mg/L	---	---	---	21	14	19	20
Sodium	mg/L	---	---	---	610	660	780	630

Notes:
Concentrations greater than the GWPS are bolded.

Acronymns:
AWQS = Aquifer Water Quality Standard
GWPS = Groundwater Protection Standard
mg/L = milligrams per liter
NS = no standard
SU = standard units
URS = Upper Retention Sump

Table 2-3
Water Quality Data Collected During Recent Groundwater Monitoring at Multiunit 1

			Multiunit 1 - Analyte Concentration by Location and Date					
			DMX-4	DMX-6	MW-6	MW-7		MW-8
Analyte	**Units**	**GWPS**	**12/15/18**	**12/16/18**	**12/16/18**	**11/4/18**	**12/17/18**	**11/4/18**
Boron	mg/L	---	2.6	2.6	6.3	7.4	8.3	14
Calcium	mg/L	---	420	420	400	320	350	390
Chloride	mg/L	---	780	2300	1500	680	640	1200
pH	SU	---	7.7	7.3	7.3	7.4	7.4	7.3
Sulfate	mg/L	---	9100	14000	11000	6100	5600	10000
Total Dissolved Solids	mg/L	---	15000	22000	17000	9900	9300	15000
Antimony	mg/L	0.01	<0.020	<0.020	<0.020	---	<0.020	---
Arsenic	mg/L	0.01	<0.010	<0.010	<0.010	<0.00050	<0.010	0.00064
Barium	mg/L	2	0.016	0.025	0.02	0.014	0.015	0.0090
Beryllium	mg/L	0.004	---	---	---	---	---	---
Cadmium	mg/L	0.005	<0.0020	<0.0020	<0.0020	<0.00010	<0.0020	0.00015
Chromium	mg/L	0.1	<0.020	<0.020	<0.020	---	<0.020	---
Cobalt	mg/L	0.01	<0.010	<0.010	<0.010	0.00056	<0.010	<0.00050
Fluoride	mg/L	5	<0.80	<0.80	<0.80	---	<0.80	<0.80
Lead	mg/L	0.015	<0.010	<0.010	<0.010	<0.00050	<0.010	<0.00050
Lithium	mg/L	1.8	0.67	1.7	1.1	0.83	0.84	1.1
Mercury	mg/L	0.002	---	---	---	---	---	---
Molybdenum	mg/L	0.1	0.013	<0.010	<0.010	0.0070	<0.010	0.011
Selenium	mg/L	0.092	0.027	0.014	0.015	0.0035	0.022	0.0014
Thallium	mg/L	0.017	<0.0020	<0.0020	<0.0020	0.00010	<0.0020	<0.00010
Alkalinity as $CaCO_3$	mg/L	---	380	790	500	---	470	---
Alkalinity, Phenolphthalein	mg/L	---	<6.0	<6.0	<6.0	---	<6.0	---
Bicarbonate Alkalinity as $CaCO_3$	mg/L	---	380	790	500	---	470	---
Carbonate Alkalinity as $CaCO_3$	mg/L	---	<6.0	<6.0	<6.0	---	<6.0	---
Hydroxide Alkalinity as $CaCO_3$	mg/L	---	<6.0	<6.0	<6.0	---	<6.0	---
Magnesium	mg/L	---	730	560	600	---	420	---
Potassium	mg/L	---	40	58	45	---	32	---
SiO_2, Silica	mg/L	---	11	17	10	---	15	---
Sodium	mg/L	---	2800	6000	4300	---	1900	---

Acronymns:

AWQS = Aquifer Water Quality Standard
GWPS = Groundwater Protection Standard
mg/L = milligrams per liter
NS = no standard
SU = standard units

Table 2-3
Water Quality Data Collected During Recent Groundwater Monitoring at Multiunit 1

			Multiunit 1 - Analyte Concentration by Location and Date					
			MW-15	MW-16	MW-17R	MW-38R	MW-49A	MW-56
Analyte	**Units**	**GWPS**	**12/16/18**	**12/16/18**	**12/17/18**	**12/15/2018**	**11/4/2018**	**12/16/2018**
Boron	mg/L	---	8.8	6.6	38	19	1.8	3.0
Calcium	mg/L	---	440	400	450	410	380	420
Chloride	mg/L	---	990	1000	400	440	590	1500
pH	SU	---	7.2	7.4	7.5	7.6	7.4	7.1
Sulfate	mg/L	---	6500	11000	4000	8900	19000	12000
Total Dissolved Solids	mg/L	---	12000	17000	6200	13000	27000	19000
Antimony	mg/L	0.01	<0.020	<0.020	<0.020	<0.020	---	<0.020
Arsenic	mg/L	0.01	<0.010	<0.010	<0.010	<0.010	0.0012	<0.010
Barium	mg/L	2	0.022	0.026	0.027	0.026	0.020	0.029
Beryllium	mg/L	0.004	---	---	---	---	---	---
Cadmium	mg/L	0.005	<0.0020	<0.0020	<0.0020	<0.0020	0.00027	<0.0020
Chromium	mg/L	0.1	<0.020	<0.020	<0.020	<0.020	---	<0.020
Cobalt	mg/L	0.01	<0.010	<0.010	**0.091**	**0.093**	0.0020	<0.010
Fluoride	mg/L	5	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
Lead	mg/L	0.015	<0.010	<0.010	<0.010	<0.010	<0.00050	<0.010
Lithium	mg/L	1.8	0.91	1.1	0.41	0.80	1.2	1.1
Mercury	mg/L	0.002	---	---	---	---	---	---
Molybdenum	mg/L	0.1	<0.010	<0.010	<0.010	<0.010	0.014	<0.010
Selenium	mg/L	0.092	0.016	0.06	0.019	0.044	0.0016	0.21
Thallium	mg/L	0.017	<0.0020	<0.0020	<0.0020	<0.0020	0.0016	<0.0020
Alkalinity as $CaCO_3$	mg/L	---	610	550	130	270	---	650
Alkalinity, Phenolphthalein	mg/L	---	<6.0	<6.0	<6.0	<6.0	---	<6.0
Bicarbonate Alkalinity as $CaCO_3$	mg/L	---	610	550	130	270	---	650
Carbonate Alkalinity as $CaCO_3$	mg/L	---	<6.0	<6.0	<6.0	<6.0	---	<6.0
Hydroxide Alkalinity as $CaCO_3$	mg/L	---	<6.0	---	<6.0	<6.0	---	<6.0
Magnesium	mg/L	---	550	1200	260	680	---	1300
Potassium	mg/L	---	38	46	19	39	---	54
SiO_2, Silica	mg/L	---	14	12	14	17	---	20
Sodium	mg/L	---	2100	2900	1000	2500	---	3400

Acronymns:

AWQS = Aquifer Water Quality Standard
GWPS = Groundwater Protection Standard
mg/L = milligrams per liter
NS = no standard
SU = standard units

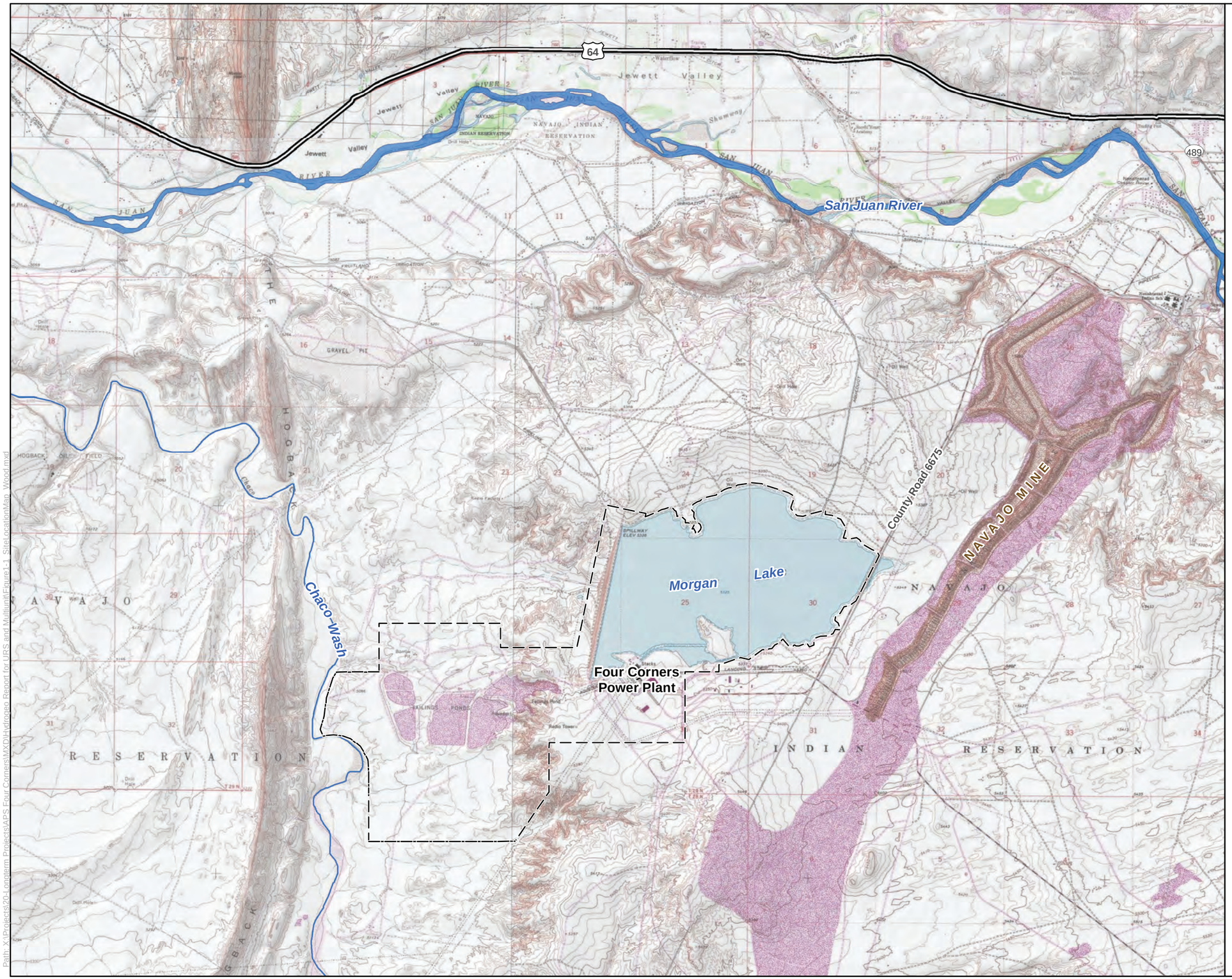
Table 2-3
Water Quality Data Collected During Recent Groundwater Monitoring at Multiunit 1

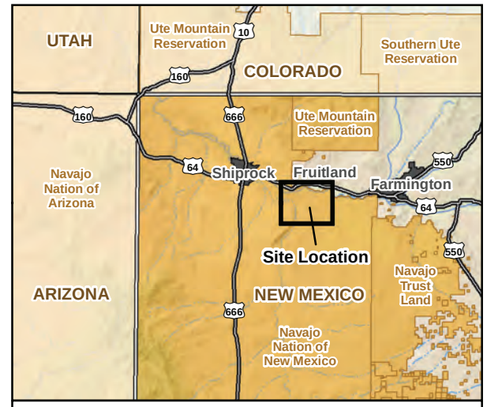
			Multiunit 1 - Analyte Concentration by Location and Date					
			MW-57	MW-61		MW-75		MW-87
Analyte	**Units**	**GWPS**	**12/15/2018**	**11/3/2018**	**12/15/2018**	**11/3/2018**	**12/15/2018**	**3/19/2019**
Boron	mg/L	---	2.1	37	40	24	25	---
Calcium	mg/L	---	430	470	490	430	450	---
Chloride	mg/L	---	510	340	310	310	280	---
pH	SU	---	7.5	8.6	8.7	8.3	8.4	---
Sulfate	mg/L	---	7800	3600	3500	4300	4300	---
Total Dissolved Solids	mg/L	---	12000	5300	5500	6200	6600	---
Antimony	mg/L	0.01	<0.020	---	<0.020	---	<0.020	0.0037
Arsenic	mg/L	0.01	<0.010	0.00084	<0.010	0.00060	<0.010	0.0023
Barium	mg/L	2	0.023	0.015	0.019	0.017	0.022	0.023
Beryllium	mg/L	0.004	---	---	---	---	---	---
Cadmium	mg/L	0.005	<0.0020	0.00088	<0.0020	0.0018	<0.0020	0.00013
Chromium	mg/L	0.1	<0.020	---	<0.020	---	<0.020	<0.0010
Cobalt	mg/L	0.01	<0.010	**0.018**	**0.022**	**0.045**	**0.046**	**0.032**
Fluoride	mg/L	5	<0.80	---	1.3	1.2	1.2	<0.80
Lead	mg/L	0.015	<0.010	0.00086	<0.010	0.0030	<0.010	0.00062
Lithium	mg/L	1.8	0.80	0.35	0.37	0.39	0.41	1.1
Mercury	mg/L	0.002	---	---	---	---	---	---
Molybdenum	mg/L	0.1	<0.010	0.090	**0.10**	**0.18**	**0.17**	**0.12**
Selenium	mg/L	0.092	0.022	0.00061	0.023	0.0026	0.026	0.090
Thallium	mg/L	0.017	<0.0020	0.00016	<0.0020	0.00018	<0.0020	<0.00010
Alkalinity as $CaCO_3$	mg/L	---	470	---	85	---	87	---
Alkalinity, Phenolphthalein	mg/L	---	<6.0	---	<6.0	---	<6.0	---
Bicarbonate Alkalinity as $CaCO_3$	mg/L	---	470	---	75	---	87	---
Carbonate Alkalinity as $CaCO_3$	mg/L	---	<6.0	---	9.8	---	<6.0	---
Hydroxide Alkalinity as $CaCO_3$	mg/L	---	<6.0	---	<6.0	---	<6.0	---
Magnesium	mg/L	---	610	---	120	---	220	---
Potassium	mg/L	---	42	---	20	---	21	---
SiO_2, Silica	mg/L	---	17	---	7.7	---	6.9	---
Sodium	mg/L	---	2200	---	1000	---	1200	---

Acronymns:

AWQS = Aquifer Water Quality Standard
GWPS = Groundwater Protection Standard
mg/L = milligrams per liter
NS = no standard
SU = standard units

FIGURES





Area of Detail

Legend

- FCPP Lease Boundary
- Stream

Notes:

FCPP Four Corners Power Plant

0 2,000 4,000 Feet

N

Arizona Public Service
Four Corners Power Plant
Fruitland, New Mexico

Site Location Map

FIGURE **1-1**

Job No.:	14-2018-2068
PM:	EHL
Date:	1/31/2020
Scale:	1" = 4,000'

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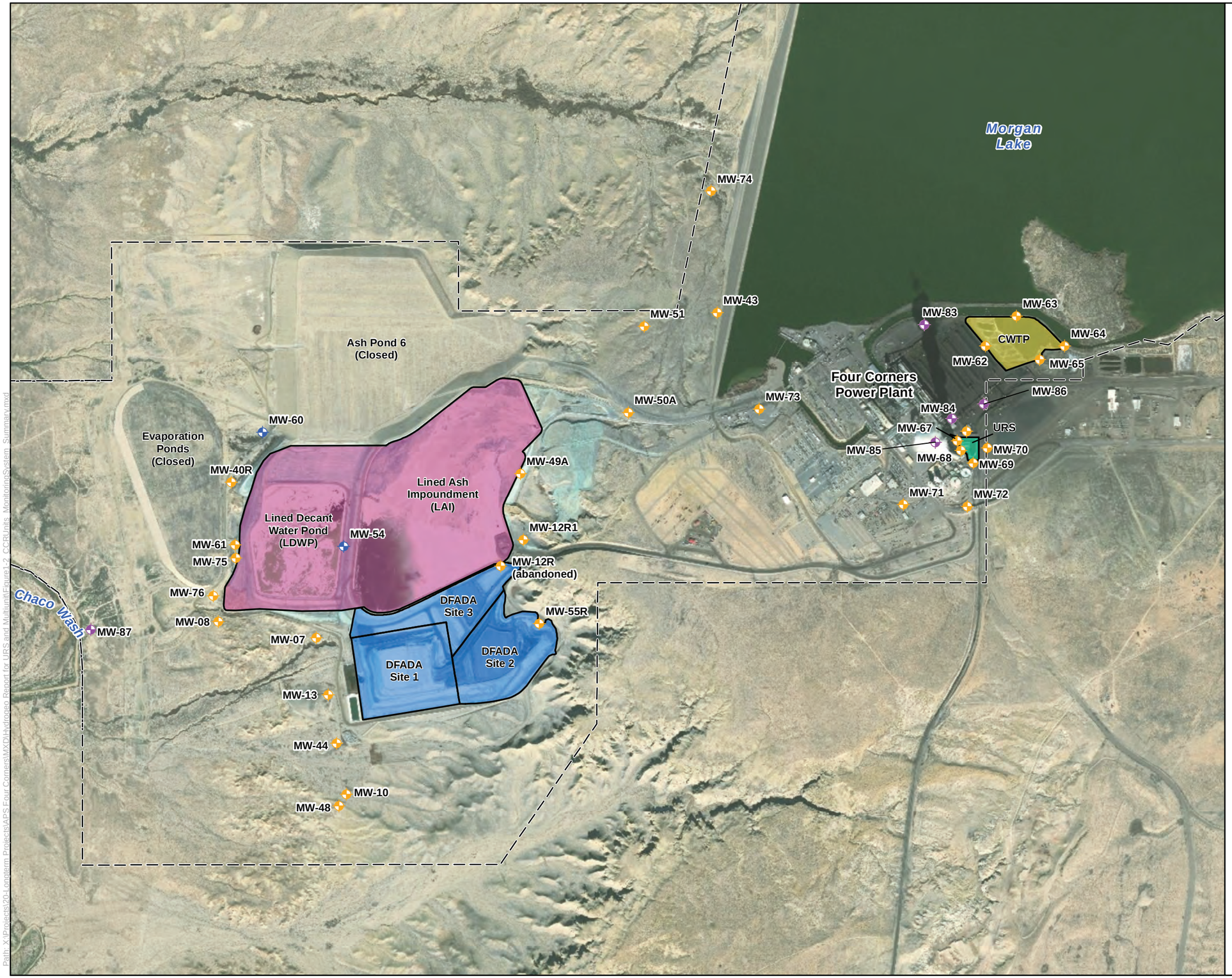
wood.

Path: X:\Projects\20-Longterm Projects\APS Four Corners\MXD\Hydrogeo Report for URS and Multiunit\Figure1-1_SiteLocationMap_Wood.mxd



Legend

- CCR Monitoring Well Location (installed November 2018)
- CCR Monitoring Well Location
- Supplementary Site Monitoring Well Location
- FCPP Lease Boundary

CCR Units

- Multiunit 1(LAI and LDWP)
- Dry Fly Ash Disposal Area
- Combined Waste Treatment Pond (CWTP)
- Upper Retention Sump (URS)

Notes:

CCR	Coal Combustion Residuals
CWTP	Combined Waste Treatment Pond
DFADA	Dry Fly Ash Disposal Area
FCPP	Four Corners Power Plant
LAI	Lined Ash Impoundment
LDWP	Lined Decant Water Pond
URS	Upper Retention Sump

N

0 350 700 1,400 Feet

Arizona Public Service
Four Corners Power Plant
Fruitland, New Mexico

CCR Units and Monitoring System Summary

FIGURE **1-2**

Job No.:	14-2018-2068
PM:	EHL
Date:	1/31/2020
Scale:	1" = 1,400'

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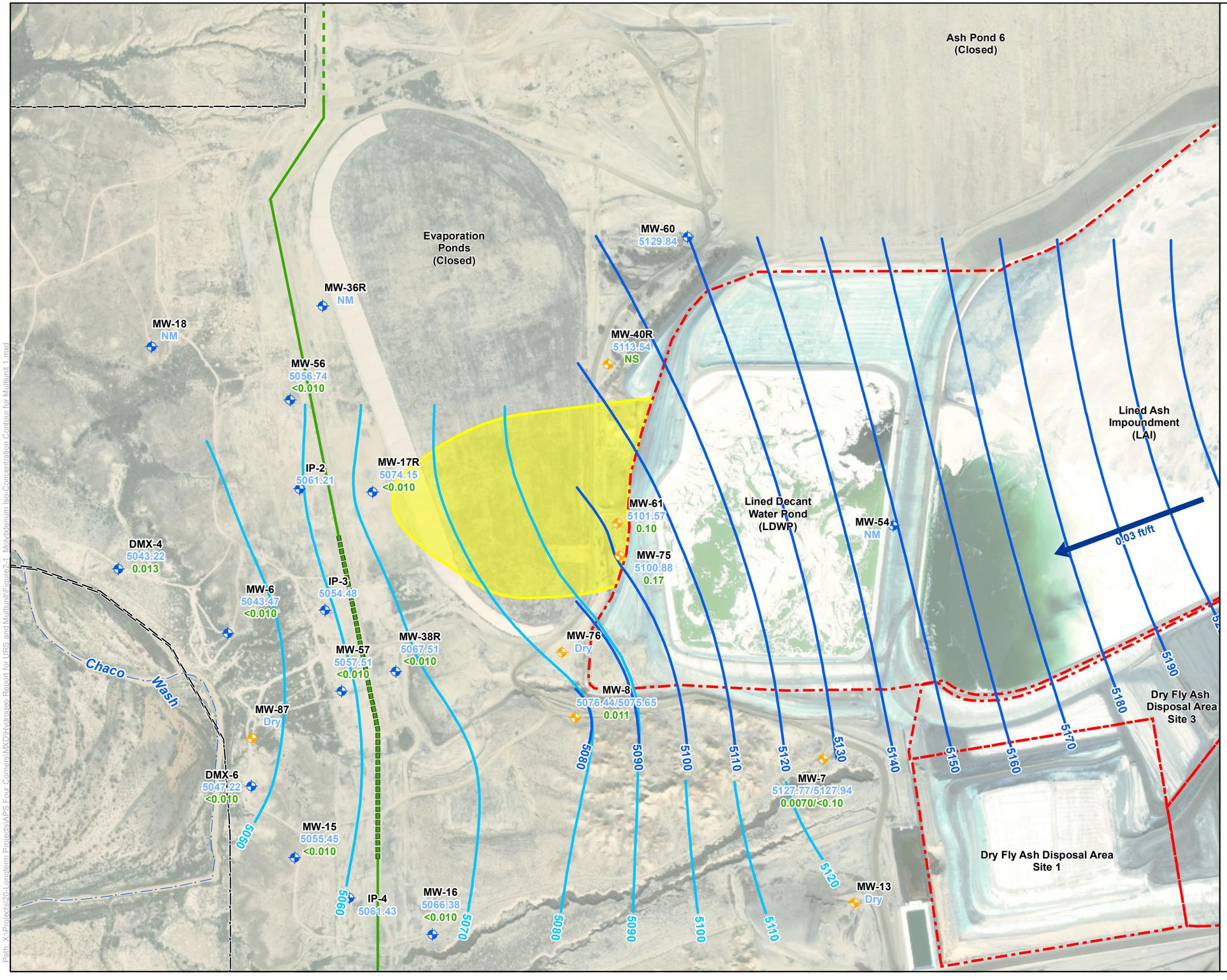
Path: X:\Projects\20-Longterm Projects\APS Four Corners\MXD\Hydrogeo Report for URS and Multiunit\Figure1-2_CCRUnits_MonitoringSystem_Summary.mxd



Legend

- CCR Monitoring Well Location
- Supplementary Site Monitoring Well Location
- Four Corners Power Plant Lease Boundary
- Ephemeral Surface Water Feature
- North Intercept Trench
- South Intercept Trench
- Approximate Extent of High Flow Zone
- CCR Unit Boundary

Potentiometric Surface - November 2018

- (Dashed Where Inferred)
- Groundwater Flow Direction with Gradient (ft/ft)

Potentiometric Surface - December 2018

- (Dashed Where Inferred)

Molybdenum Concentration

(November/December 2018)

- >0.1 mg/L
- GWPS (0.1 mg/L; Dashed Where Inferred)

Notes:

MW-49A	Well identification
5240.67	Groundwater Elevation (ft amsl) measured in November/December 2018
0.014	Molybdenum concentration (mg/L)
ft amsl	Feet above mean sea level
GWPS	Groundwater Protection Standard
mg/L	milligram per liter
NM	Not measured
NS	Not enough water to sample

0 165 330 660 Feet

N

Arizona Public Service
Four Corners Power Plant
Fruitland, New Mexico

FIGURE **2-1**

Molybdenum Iso-Concentration Map for Multiunit 1

Job No.	14-2019-2017
PM:	EHL
Date:	1/31/2020
Scale:	1" = 660'

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Path: X:\Projects\20-Longterm Projects\APS Four Corners\MXD\Hydrogeo Report for URS and Multiunit\Figure2-1_Molybdenum Iso-Concentration Contour for Multiunit 1.mxd

Ash Pond 6
(Closed)

Evaporation
Ponds
(Closed)

MW-60
5129.84

MW-18
NM

MW-36R
NM

MW-40R
5113.54
NS

MW-56
5056.74
<0.010

MW-17R
5074.15
0.091

IP-2
5061.21

MW-61
5101.57
0.018/0.022

Lined Decant
Water Pond
(LDWP)

MW-54
NM

Lined Ash
Impoundment
(LAI)

DMX-4
5043.22
<0.010

MW-75
5100.88
0.045/0.046

0.03 ft/ft

IP-3
5054.48

MW-6
5043.47
<0.010

MW-38R
5067.51
0.093

MW-76
Dry

MW-57
5057.51
<0.010

MW-8
5075.65
<0.00050

Chaco Wash

MW-87
Dry

Dry Fly Ash
Disposal Area
Site 3

DMX-6
5047.22
<0.010

MW-7
5127.94
0.00056/<0.010

MW-15
5055.45
<0.010

Dry Fly Ash Disposal Area
Site 1

IP-4
5061.43

MW-13
Dry

MW-16
5066.38
<0.010

5080 5090 5100 5110 5120 5130 5140 5150 5160 5170 5180 5190 5200 5070 5060 5050

Legend

- Four Corners Power Plant Lease Boundary
- Ephemeral Surface Water Feature
- North Intercept Trench
- South Intercept Trench
- Approximate Extent of High Flow Zone
- CCR Unit Boundary

Potentiometric Surface - November 2018

- (Dashed Where Inferred)
- Groundwater Flow Direction with Gradient (ft/ft)

Potentiometric Surface - December 2018

- (Dashed Where Inferred)

Cobalt Concentration (November/December 2018)

- >0.01 mg/L
- GWPS (0.01 mg/L; Dashed Where Inferred)

Notes:

MW-49A	Well identification
5240.67	Groundwater Elevation (ft amsl) measured in November/December 2018
0.014	Cobalt concentration (mg/L)
ft amsl	Feet above mean sea level
GWPS	Groundwater Protection Standard
mg/L	milligram per liter
NM	Not measured
NS	Not enough water to sample

0 275 550 1,100 Feet

N

Arizona Public Service
Four Corners Power Plant
Fruitland, New Mexico

FIGURE **2-2**

Cobalt Iso-Concentration Map for Multiunit 1

Job No.	14-2019-2017
PM:	EHL
Date:	1/31/2020
Scale:	1" = 550'

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Path: X:\Projects\20-Longterm Projects\APS Four Corners\MXD\Hydrogeo Report for URS and Multiunit\Figure2-2_Cobalt Iso-Concentration Contour for Multiunit 1.mxd



Legend

- CCR Monitoring Well Location
- Supplementary Site Monitoring Well Location
- CCR Monitoring Well Location Installed in 2018
- CCR Unit Boundary
- FCPP Lease Boundary
- Groundwater Flow Direction with Gradient (ft/ft)

Potentiometric Surface - November 2018

- (Dashed Where Inferred)

Fluoride Concentration (November/December 2018)

- >4 mg/L
- GWPS (4 mg/L)

Notes:

MW-64	Well identification
533.50	Groundwater Elevation (ft amsl) measured in November 2018
1.4	Fluoride concentration (mg/L) sampled in November/December 2018
CCR	Coal Combustion Residuals
CWTP	Combined Waste Treatment Pond
FCPP	Four Corners Power Plant
ft	Feet
ft amsl	Feet above mean sea level
GWPS	Groundwater Protection Standard
mg/L	milligram per liter
NM	Not measured
URS	Upper Retention Sump

0 125 250 500 Feet

N

Arizona Public Service
Four Corners Power Plant
Fruitland, New Mexico

FIGURE **2-3**

Fluoride Iso-Concentration Map for the URS

Job No.	14-2018-2068
PM:	EHL
Date:	1/31/2020
Scale:	1" = 500'

wood.

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Path: X:\Projects\20-Longterm Projects\APS Four Corners\MXD\Hydrogeo Report for URS and Multiunit\Figure2-1_Fluoride_URS.mxd

APPENDIX A

Boring Logs and Well Construction Diagrams

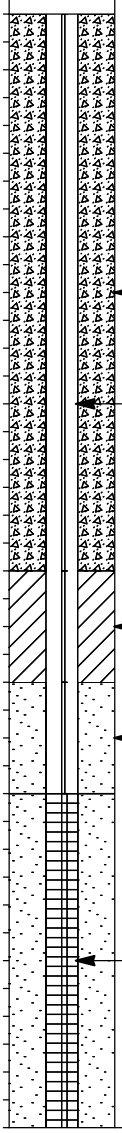
wood.

Environment & Infrastructure Solutions, Inc.
4600 East Washington Street, Suite 600
Phoenix, Arizona 85034

BORING LOG I.D.: MW-83

PROJECT:	APS Well Installation		**PROJECT LOCATION:**	San Juan County, New Mexico	
LOGGED BY:	C. Pine		**PROJECT FEATURE:**	URS	
DRILLER:	B. Gresham		**WOOD PROJECT #:**	14-2018-2068	
DRILLER FIRM:	Cascade		**ADWR REG. #:**	N/A	
RIG I.D.:	- - -		**COORDINATES:**	N2071872.332, E2533647.779	
RIG TYPE:	Rotosonic		**COORDINATE SYS:**	NM West State Plane NAD83	
BORING TYPE:	- - -	**BORING DIA.:** 8"	**SURFACE ELEV. (FT):**	5341.507	
ORIENTATION:	90°		**MEAS. PT. ELEV (FT):**	5343.152	
HAMMER TYPE:	N/A		**VERTICAL DATUM:**	NAVD88	
HAMMER CALIBRATION-ENERGY TRANSFER RATIO:		N/A	**COMPLETION DATE:**	11-29-2018	**COMPLETION TIME:** 09:24
START DATE:	11-28-2018	**START TIME:** 15:05			

Elevation in Feet	Depth in Feet	Graphical Log	Sample ID. or Date (Time)	PID Meter Reading (ppm)	Unified Soil Classification	VISUAL CLASSIFICATION (Color, Moist, % by wt., Plasticity, Dilatancy, Toughness, Dry Strength, Consistency)
5341.5	0					Hydro Excavated from 0 to 6'
5336.5	5					**SAND MIXED WITH FLY ASH,** fine grained, nonplastic, gray, moist, soft
5331.5	10					**SILTY SAND,** fine grained, nonplastic, brown, moist, soft, reacts to HCl
5326.5	15					**SANDSTONE,** very weathered, clay lens, fine grained, medium plasticity, yellowish-brown, moist, dense, reacts to HCl
5321.5	20					



Depth in Feet	WELL INFORMATION (Construction Details and/or Drilling Remarks)
0	+2' Above ground vault +2' to 5' Surface completion consisting of steel conductor casing with secondary PVC casing +1' to 5' 8" Schedule 40 PVC secondary casing to seal out coal dust
5	Cement grout from 0 to 10'
10	4" Nominal diameter Schedule 80 PVC Blank casing from 0 to 14'
10	Bentonite plug from 10' to 12'
10	Filter pack (8-12) from 12' to 30'
15	4" Nominal diameter Schedule 80 PVC (0.020" slot screen) from 14' to 29'
20	

(Continued Next Page)

GROUNDWATER

	DEPTH(ft bgs)	HOUR	DATE
▽		none	
▼			
▼			
▼			

METHOD N/A

aps	UNIT	DISC.	TYPE	SYS	NUMBER	SHEET	WELL
							MW-83

wood.

Environment & Infrastructure Solutions, Inc.
4600 East Washington Street, Suite 600
Phoenix, Arizona 85034

BORING LOG I.D.: MW-83

PROJECT:	APS Well Installation	**PROJECT LOCATION:**	San Juan County, New Mexico
ADWR REG. #:	N/A	**PROJECT FEATURE:**	URS

Elevation in Feet	Depth in Feet	Graphical Log	Sample ID. or Date (Time)	PID Meter Reading (ppm)	Unified Soil Classification	VISUAL CLASSIFICATION (Color, Moist, % by wt., Plasticity, Dilatancy, Toughness, Dry Strength, Consistency)
5321.5	20					**SANDSTONE,** continued
5316.5	25					
5311.5	30					**SHALE,** weathered, fine grained, medium to high plasticity, yellowish-brown to olive gray, moist, stiff, no reaction to HCl
5306.5	35					Total Depth = 35'
5301.5	40					
5296.5	45					

Depth in Feet	WELL INFORMATION (Construction Details and/or Drilling Remarks)
20	(Continued)
	Filter pack (8-12) from 12' to 30'
25	4" Nominal diameter Schedule 80 PVC (0.020" slot screen) from 14' to 29'
30	Bentonite Chips in transition zone from 30' to 35'
35	Total Depth = 35'
40	
45	

GROUNDWATER

	DEPTH(ft bgs)	HOUR	DATE
▽		none	
▼			
▼			
▼			

METHOD N/A

aps	UNIT	DISC.	TYPE	SYS	NUMBER	SHEET	WELL
							MW-83

wood.

Environment & Infrastructure Solutions, Inc.
4600 East Washington Street, Suite 600
Phoenix, Arizona 85034

BORING LOG I.D.: MW-84

PROJECT:	APS Well Installation		**PROJECT LOCATION:**	San Juan County, New Mexico	
LOGGED BY:	C. Pine		**PROJECT FEATURE:**	URS	
DRILLER:	B. Gresham		**WOOD PROJECT #:**	14-2018-2068	
DRILLER FIRM:	Cascade		**ADWR REG. #:**	N/A	
RIG I.D.:	- - -		**COORDINATES:**	N2070510.119, E2534044.644	
RIG TYPE:	Rotosonic		**COORDINATE SYS:**	NM West State Plane NAD83	
BORING TYPE:	- - -	**BORING DIA.:** 8"	**SURFACE ELEV. (FT):**	5339.339	
ORIENTATION:	90°		**MEAS. PT. ELEV (FT):**	5338.230	
HAMMER TYPE:	N/A		**VERTICAL DATUM:**	NAVD88	
HAMMER CALIBRATION-ENERGY TRANSFER RATIO:		N/A	**COMPLETION DATE:**	11-18-2018	**COMPLETION TIME:** 09:50
START DATE:	11-17-2018	**START TIME:** 16:00			

Elevation in Feet	Depth in Feet	Graphical Log	Sample ID. or Date (Time)	PID Meter Reading (ppm)	Unified Soil Classification	VISUAL CLASSIFICATION (Color, Moist, % by wt., Plasticity, Dilatancy, Toughness, Dry Strength, Consistency)
5339.3	0					Hydro Excavated from 0 to 6' **FLY ASH/CCR,** trace gravel to 1", fine grained, subrounded, nonplastic, black, damp, soft
5334.3	5				CH	**SANDY CLAY,** fine grained, low to medium plasticity, yellowish-brown to olive gray, moist, medium stiff
5329.3	10					**SANDSTONE,** weathered, fine grained, nonplastic, yellowish-brown, dense note: thin layer of limestone up to 6" to 1' thick, gray & very hard at 11'6"
▽ 5324.3	15				CL	**SANDY CLAY,** low to medium plasticity, yellowish-brown to olive gray, moist, medium stiff
						SANDSTONE, weathered, fine grained, nonplastic, moist, medium stiff
5319.3	20					

Depth in Feet	WELL INFORMATION (Construction Details and/or Drilling Remarks)
0	0 to 5' Surface completion consisting of steel conductor casing with secondary PVC casing 1' to 5', 8" diameter schedule 40 PVC secondary casing of seal out coal dust
	Cement grout from 0 to 5'
5	Bentonite plug from 5' to 7'
	4" Nominal diameter Schedule 80 PVC Blank casing from 0 to 10'
10	
	Filter pack (8-12) from 7' to 30'
15	4" Nominal diameter Schedule 80 PVC (0.020" slot screen) from 10' to 30'
20	

GROUNDWATER

	DEPTH(ft bgs)	HOUR	DATE
▽	15.0	- - -	- - -
▼			
▼			
▼			

METHOD N/A

(Continued Next Page)

aps	UNIT	DISC.	TYPE	SYS	NUMBER	SHEET	WELL
							MW-84

wood.
Environment & Infrastructure Solutions, Inc.
4600 East Washington Street, Suite 600
Phoenix, Arizona 85034

BORING LOG I.D.: MW-84

PROJECT:	APS Well Installation	**PROJECT LOCATION:**	San Juan County, New Mexico
ADWR REG. #:	N/A	**PROJECT FEATURE:**	URS

Elevation in Feet	Depth in Feet	Graphical Log	Sample ID. or Date (Time)	PID Meter Reading (ppm)	Unified Soil Classification	VISUAL CLASSIFICATION (Color, Moist, % by wt., Plasticity, Dilatancy, Toughness, Dry Strength, Consistency)
5319.3	20					**SANDSTONE,** continued
						SANDY CLAY, low to medium plasticity, yellowish-brown to olive gray, moist, medium stiff
						SANDSTONE, weathered, fine grained, nonplastic, yellowish-brown, moist, stiff
5314.3	25					
5309.3	30					**SHALE,** weathered, fine grained, high plasticity, yellowish-brown to olive gray, moist, stiff to very stiff
5304.3	35					Total Depth = 35'
5299.3	40					
5294.3	45					

Depth in Feet	WELL INFORMATION (Construction Details and/or Drilling Remarks)
20	(Continued)
	Filter pack (8-12) from 7' to 30'
25	4" Nominal diameter Schedule 80 PVC (0.020" slot screen) from 10' to 30'
30	Chips in transition zone from 30' to 35'
35	Total Depth = 35'
40	
45	

GROUNDWATER

	DEPTH(ft bgs)	HOUR	DATE
▽	15.0	- - -	- - -
▼			
▼			
▼			

METHOD N/A

aps	UNIT	DISC.	TYPE	SYS	NUMBER	SHEET	WELL
							MW-84

wood.

Environment & Infrastructure Solutions, Inc.
4600 East Washington Street, Suite 600
Phoenix, Arizona 85034

BORING LOG I.D.: MW-85

PROJECT:	APS Well Installation		**PROJECT LOCATION:**	San Juan County, New Mexico	
LOGGED BY:	C. Pine		**PROJECT FEATURE:**	URS	
DRILLER:	B. Gresham		**WOOD PROJECT #:**	14-2018-2068	
DRILLER FIRM:	Cascade		**ADWR REG. #:**	N/A	
RIG I.D.:	- - -		**COORDINATES:**	N2070175.549, E2533808.629	
RIG TYPE:	Rotosonic		**COORDINATE SYS:**	NM West State Plane NAD83	
BORING TYPE:	- - -	**BORING DIA.:** 8"	**SURFACE ELEV. (FT):**	5353.687	
ORIENTATION:	90°		**MEAS. PT. ELEV (FT):**	5352.783	
HAMMER TYPE:	N/A		**VERTICAL DATUM:**	NAVD88	
HAMMER CALIBRATION-ENERGY TRANSFER RATIO:		N/A	**COMPLETION DATE:**	11-18-2018	**COMPLETION TIME:** 16:05
START DATE:	11-18-2018	**START TIME:** 10:50			

Elevation in Feet	Depth in Feet	Graphical Log	Sample ID. or Date (Time)	PID Meter Reading (ppm)	Unified Soil Classification	VISUAL CLASSIFICATION (Color, Moist, % by wt., Plasticity, Dilatancy, Toughness, Dry Strength, Consistency)
5353.7	0				CH	Hydro Excavated from 0 to 6' 2" Asphaltic Concrete **SANDY CLAY WITH GRAVEL,** gravel up to 1", subrounded, high plasticity, yellowish-brown, medium stiff
5348.7	5					**SANDSTONE,** weathered,, fine grained, nonplastic, yellowish-brown, moist
						note: trace iron-oxide at 8'
5343.7	10					
						note: trace calcium carbonate at 14'6"
5338.7	15					
5333.7	20					

Depth in Feet	WELL INFORMATION (Construction Details and/or Drilling Remarks)
0	Cement grout from 0 to 7'
5	4" Nominal diameter Schedule 80 PVC Blank casing from 0 to 15'
10	Bentonite chips from 7' to 10'
	Filter pack (8-12) from 10' to 35'
15	4" Nominal diameter Schedule 80 PVC (0.020" slot screen) from 15' to 30'
20	

(Continued Next Page)

GROUNDWATER

	DEPTH(ft bgs)	HOUR	DATE
▽		none	
▼			
▼			
▼			

METHOD N/A

aps	UNIT	DISC.	TYPE	SYS	NUMBER	SHEET	WELL
							MW-85

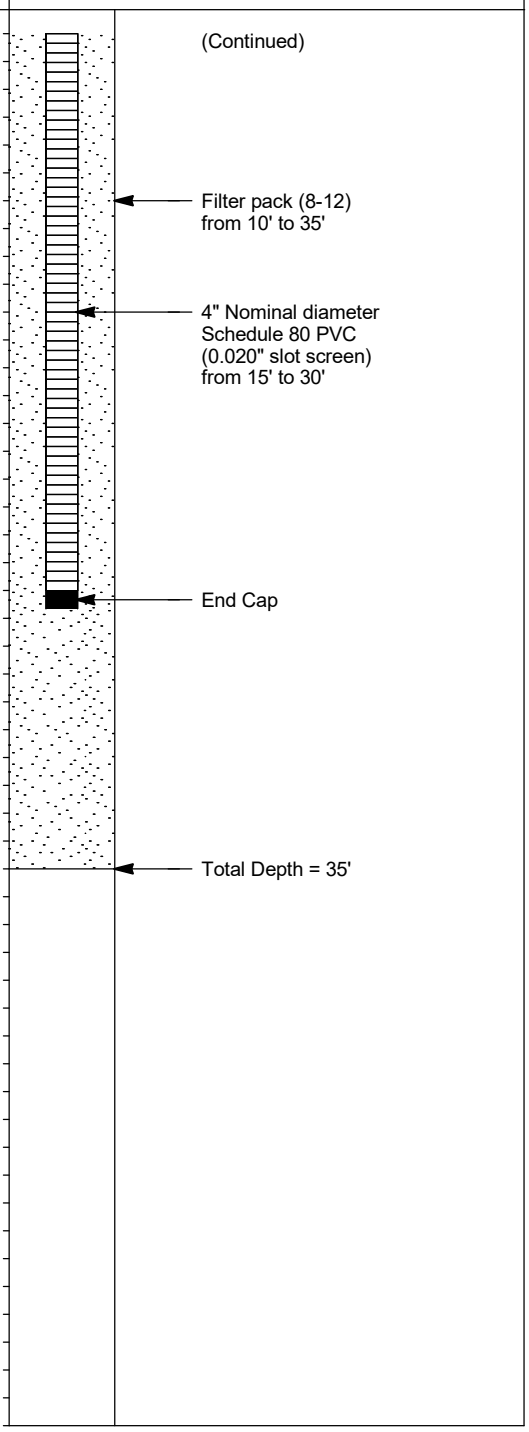
wood.

Environment & Infrastructure Solutions, Inc.
4600 East Washington Street, Suite 600
Phoenix, Arizona 85034

BORING LOG I.D.: MW-85

PROJECT:	APS Well Installation	**PROJECT LOCATION:**	San Juan County, New Mexico
ADWR REG. #:	N/A	**PROJECT FEATURE:**	URS

Elevation in Feet	Depth in Feet	Graphical Log	Sample ID. or Date (Time)	PID Meter Reading (ppm)	Unified Soil Classification	VISUAL CLASSIFICATION (Color, Moist, % by wt., Plasticity, Dilatancy, Toughness, Dry Strength, Consistency)
5333.7	20					**SANDSTONE,** continued
					CL	**SANDY CLAY LENS,** high plasticity, yellowish-brown to olive gray, moist, stiff
						SANDSTONE, weathered, fine grained, weakly cemented, gray to brown, moist, hard
5328.7	25					
5323.7	30					
						SHALE, weathered, fine grained, yellowish-brown to olive gray, moist, very stiff
5318.7	35					Total Depth = 35'
5313.7	40					
5308.7	45					



GROUNDWATER

	DEPTH(ft bgs)	HOUR	DATE
▽		none	
▼			
▼			
▼			

METHOD N/A

aps	UNIT	DISC.	TYPE	SYS	NUMBER	SHEET	WELL
							MW-85

wood.

Environment & Infrastructure Solutions, Inc.
4600 East Washington Street, Suite 600
Phoenix, Arizona 85034

BORING LOG I.D.: MW-86

PROJECT:	APS Well Installation		**PROJECT LOCATION:**	San Juan County, New Mexico	
LOGGED BY:	C. Pine		**PROJECT FEATURE:**	URS	
DRILLER:	B. Gresham		**WOOD PROJECT #:**	14-2018-2068	
DRILLER FIRM:	Cascade		**ADWR REG. #:**	N/A	
RIG I.D.:	- - -		**COORDINATES:**	N2070725.020, E2534508.889	
RIG TYPE:	Rotosonic		**COORDINATE SYS:**	NM West State Plane NAD83	
BORING TYPE:	- - -	**BORING DIA.:** 8"	**SURFACE ELEV. (FT):**	5338.735	
ORIENTATION:	90°		**MEAS. PT. ELEV (FT):**	5338.758	
HAMMER TYPE:	N/A		**VERTICAL DATUM:**	NAVD88	
HAMMER CALIBRATION-ENERGY TRANSFER RATIO:		N/A	**COMPLETION DATE:**	11-17-2018	**COMPLETION TIME:** 13:48
START DATE:	11-17-2018	**START TIME:** 07:35			

Elevation in Feet	Depth in Feet	Graphical Log	Sample ID. or Date (Time)	PID Meter Reading (ppm)	Unified Soil Classification	VISUAL CLASSIFICATION (Color, Moist, % by wt., Plasticity, Dilatancy, Toughness, Dry Strength, Consistency)
5338.7	0					Hydro Excavated from 0 to 6' Mixture of fine coal/ **SANDY CLAY WITH GRAVEL,** gravel up to 3", subrounded, nonplastic to low plasticity, brown to black, damp
5333.7	5					**SANDSTONE,** fine grained, weakly cemented, nonplastic, yellowish-brown, moist, medium dense to dense
5328.7	10					
5323.7	15					note: color change to tan at 16'
5318.7	20					**SHALE,** very weathered, fine grained, high plasticity, olive brown, moist to saturated, soft to stiff, trace iron-oxide

Depth in Feet	WELL INFORMATION (Construction Details and/or Drilling Remarks)
0	Cement grout from 0 to 5'
5	Bentonite chips from 5' to 7'
	4" Nominal diameter Schedule 80 PVC Blank casing from 0 to 10'
10	
	Filter pack (8-12) from 7' to 35'
15	
	4" Nominal diameter Schedule 80 PVC (0.020" slot screen) from 10' to 30'
20	

(Continued Next Page)

GROUNDWATER

	DEPTH(ft bgs)	HOUR	DATE
▽	25.0	10:15	- - -
▼			
▼			
▼			

METHOD N/A

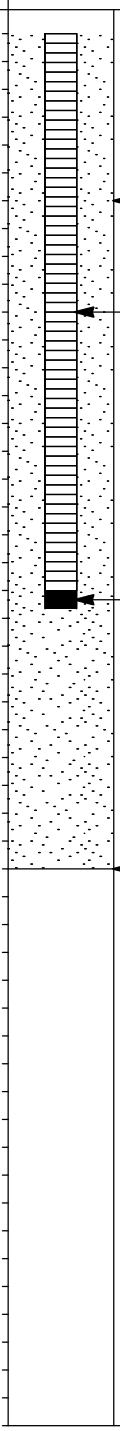
aps	UNIT	DISC.	TYPE	SYS	NUMBER	SHEET	WELL
							MW-86

wood.
Environment & Infrastructure Solutions, Inc.
4600 East Washington Street, Suite 600
Phoenix, Arizona 85034

BORING LOG I.D.: MW-86

PROJECT:	APS Well Installation	**PROJECT LOCATION:**	San Juan County, New Mexico
ADWR REG. #:	N/A	**PROJECT FEATURE:**	URS

Elevation in Feet	Depth in Feet	Graphical Log	Sample ID. or Date (Time)	PID Meter Reading (ppm)	Unified Soil Classification	VISUAL CLASSIFICATION (Color, Moist, % by wt., Plasticity, Dilatancy, Toughness, Dry Strength, Consistency)
5318.7	20					**SHALE,** continued
▽ 5313.7	25					**SANDSTONE,** weathered, fine grained, weakly cemented, yellowish-brown to reddish-brown note: trace cobble or rock lens at 25'
5308.7	30					**SAND & CLAY MIXTURES,** fine grained, low to medium plasticity, yellowish-brown to olive gray, soft to stiff, trace calcium carbonate
5303.7	35					**SHALE,** weathered, fine grained, trace sand lens, high plasticity, olive gray, very stiff, trace calcium carbonate Total Depth = 35'
5298.7	40					
5293.7	45					



WELL INFORMATION
(Construction Details and/or Drilling Remarks)

GROUNDWATER

	DEPTH(ft bgs)	HOUR	DATE
▽	25.0	10:15	- - -
▼			
▼			
▼			

METHOD N/A

aps	UNIT	DISC.	TYPE	SYS	NUMBER	SHEET	WELL MW-86

wood.

Environment & Infrastructure Solutions, Inc.
4600 East Washington Street, Suite 600
Phoenix, Arizona 85034

BORING LOG I.D.: MW-87

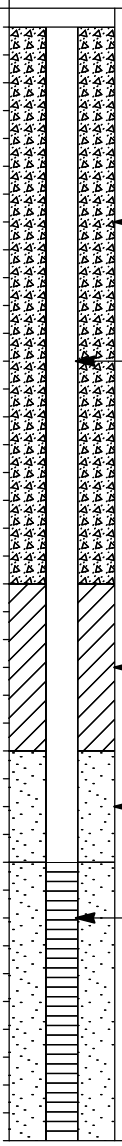
PROJECT:	APS Well Installation		**PROJECT LOCATION:**	San Juan County, New Mexico	
LOGGED BY:	C. Pine		**PROJECT FEATURE:**	Multiunit	
DRILLER:	B. Gresham		**WOOD PROJECT #:**	14-2018-2068	
DRILLER FIRM:	Cascade		**ADWR REG. #:**	N/A	
RIG I.D.:	- - -		**COORDINATES:**	N2067465.028, E2521608.195	
RIG TYPE:	Rotosonic		**COORDINATE SYS:**	NM West State Plane NAD83	
BORING TYPE:	- - -	**BORING DIA.:** 8"	**SURFACE ELEV. (FT):**	5074.291	
ORIENTATION:	90°		**MEAS. PT. ELEV (FT):**	5076.527	
HAMMER TYPE:	N/A		**VERTICAL DATUM:**	NAVD88	
HAMMER CALIBRATION-ENERGY TRANSFER RATIO:		N/A	**COMPLETION DATE:**	11-28-2018	**COMPLETION TIME:** 11:55
START DATE:	11-27-2018	**START TIME:** 16:05			

Elevation in Feet	Depth in Feet	Graphical Log	Sample ID. or Date (Time)	PID Meter Reading (ppm)	Unified Soil Classification	VISUAL CLASSIFICATION (Color, Moist, % by wt., Plasticity, Dilatancy, Toughness, Dry Strength, Consistency)
5074.3	0					Hydro Excavated from 0 to 6'
5069.3	5				SM	**SILTY SAND,** fine grained, nonplastic, yellowish-brown, damp, soft, slight reaction to HCl
					SC-SM	**CLAYEY SILT,** fine grained, low to medium plasticity, dark yellowish-brown, moist, medium stiff, slight reaction to HCl, trace calcium carbonate lens
5064.3	10				SM	**SILTY SAND,** predominantly fine grained, nonplastic, yellowish-brown, damp, medium dense, slight reaction to HCl
5059.3	15				SP	**SAND**
5054.3	20					

GROUNDWATER

	DEPTH(ft bgs)	HOUR	DATE
▽		none	
▼			
▼			
▼			

METHOD N/A



WELL INFORMATION
(Construction Details and/or Drilling Remarks)

(Continued Next Page)

aps	UNIT	DISC.	TYPE	SYS	NUMBER	SHEET	WELL
							MW-87

wood.
Environment & Infrastructure Solutions, Inc.
4600 East Washington Street, Suite 600
Phoenix, Arizona 85034

BORING LOG I.D.: MW-87

PROJECT:	APS Well Installation	**PROJECT LOCATION:**	San Juan County, New Mexico
ADWR REG. #:	N/A	**PROJECT FEATURE:**	Multiunit

Elevation in Feet	Depth in Feet	Graphical Log	Sample ID. or Date (Time)	PID Meter Reading (ppm)	Unified Soil Classification	VISUAL CLASSIFICATION (Color, Moist, % by wt., Plasticity, Dilatancy, Toughness, Dry Strength, Consistency)
5054.3	20				SP	**SAND,** fine grained, trace coarse grained, subrounded, nonplastic, yellowish-brown, damp, medium dense, slight reaction to HCl
						SHALE, weathered, fine grained, high plasticity, brown mixtures, damp, trace calcium carbonate
5049.3	25					
						note: damp to moist at 27'6"
5044.3	30					
						SHALE, weathered, fine grained, high plasticity, gray, damp, stiff
5039.3	35					
5034.3	40					
5029.3	45					

Depth in Feet	WELL INFORMATION (Construction Details and/or Drilling Remarks)
20	(Continued)
	Filter pack (12-20) from 13' to 50'
25	4" Nominal diameter Schedule 80 PVC (0.020" slot screen) from 15' to 45'
30	
35	
40	
45	

(Continued Next Page)

GROUNDWATER

	DEPTH(ft bgs)	HOUR	DATE
▽		none	
▼			
▼			
▼			

METHOD N/A

aps	UNIT	DISC.	TYPE	SYS	NUMBER	SHEET	WELL
							MW-87

wood.
Environment & Infrastructure Solutions, Inc.
4600 East Washington Street, Suite 600
Phoenix, Arizona 85034

BORING LOG I.D.: MW-87

PROJECT:	APS Well Installation	**PROJECT LOCATION:**	San Juan County, New Mexico
ADWR REG. #:	N/A	**PROJECT FEATURE:**	Multiunit

Elevation in Feet	Depth in Feet	Graphical Log	Sample ID. or Date (Time)	PID Meter Reading (ppm)	Unified Soil Classification	VISUAL CLASSIFICATION (Color, Moist, % by wt., Plasticity, Dilatancy, Toughness, Dry Strength, Consistency)
5029.3	45					**SHALE,** continued
						SHALE, unweathered, fine grained, strongly cemented, high plasticity, gray
5024.3	50					Total Depth = 50'
5019.3	55					
5014.3	60					
5009.3	65					
5004.3	70					

Depth in Feet	WELL INFORMATION (Construction Details and/or Drilling Remarks)
45	End Cap (Continued)
50	Total Depth = 50'
55	
60	
65	
70	

GROUNDWATER

	DEPTH(ft bgs)	HOUR	DATE
▽		none	
▼			
▼			
▼			

METHOD N/A

aps	UNIT	DISC.	TYPE	SYS	NUMBER	SHEET	WELL MW-87

APPENDIX B

Photograph Log

DAILY FIELD REPORT

Location: URS 1 **Direction:** URS 1 location hydro-vac to 6'.	

Location: URS 1 **Direction:** Down hole of URS 1.	

DAILY FIELD REPORT (continued)

Location: URS 1	
Direction: Looking east After hydro-vac and barricaded	

Location: URS 2	
Direction: URS 2 location before hydro-vac to 6’	

DAILY FIELD REPORT (continued)

Location: URS 2 **Direction:** Down hole of URS 2	

Location: **Direction:** Looking northwest after hydro-vac and barricaded	

Location: URS 4 **Direction:** Looking south after hydro-vac and barricaded.	

Location: URS 4 **Direction:** Down hole of URS 4	

DAILY FIELD REPORT (continued)

Location: URS 4	
Direction: Looking north after hydro-vac and barricaded.	

Location: MW-87 **Direction:** ELM locating utilities at MW-87.	

Location: MW-87 **Direction:** Picture shows MW-87 location and new location marked with small red bag.	

DAILY FIELD REPORT (continued)

Location: MW-87 **Direction:** Riley hydro-excavating MW-87.	

Location: MW-87 **Direction:** Looking down into MW-87.	

Location: MW-86 **Direction:** MW-86 samples @ 6.0 to 10 feet.	

Location: MW-86 **Direction:** MW-86 samples @ 10.5 to 15 feet.	

Location: MW-86 **Direction:** MW-86 samples @ 15.5 to 20 feet.	

Location: MW-86 **Direction:** MW-86 samples @ 21 to 25 feet. Water level at 25 feet.	

Location: MW-86 **Direction:** MW-86 samples @ 24.5 to 27.5 feet.	

Location: MW-86 **Direction:** MW-86 samples 28-33 feet.	

Location: MW-86 **Direction:** MW-86 samples @ 32.5 feet.	

Location: MW-86 **Direction:** MW-86 samples @ 35 feet.	

Location: MW-86 **Direction:** Placing bentonite chips to seal 30-35 feet.	

Location: MW-86 **Direction:** Setting MW-86 well.	

Location: MW-86 **Direction:** Placing filter pack in MW-86.	

Location: MW-86 **Direction:** MW-86 well set.	

Location: MW-84 **Direction:** Cascade set up and began drilling MW-84.	

Location: MW-84 **Direction:** MW-84 well sample at from 7-9 feet.	

Location: MW-84 **Direction:** MW-84 well sample at 11 feet.	

Location: MW-84 **Direction:** MW-84 well sample from 11 feet. **Direction:** MW-84 well rock sample at 12 feet.	

Location: MW-84 **Direction:** MW-84 well sample at 27.5 and 30 feet.	

Location: MW-84 **Direction:** MW-84 well sample at 33 feet.	

Location: MW-84 **Direction:** MW-84 samples @ 25 feet.	

Location: MW-84 **Direction:** MW-84 samples @ 33 feet.	

Location: MW-84 **Direction:** MW-84 samples @ 35 feet.	

Location: MW-84 **Direction:** MW-84 samples @ 35 feet.	

Location: MW-84 **Direction:** Setting well at MW-84.	

Location: MW-84 **Direction:** MW-84 well set.	

Location: MW-85 **Direction:** MW-86 samples @ 32.5 feet.	

Location: MW-85 **Direction:** MW-86 samples @ 35 feet.	

Location: MW-85 **Direction:** Placing bentonite chips to seal 30-35 feet.	

Location: MW-85 **Direction:** Setting MW-86 well.	

Location: MW-86 **Direction:** Placing filter pack in MW-86.	

Location: MW-86 **Direction:** MW-86 well set.	

Location: MW-85 **Direction:** Cascade setting up and began drilling MW-85.	

Location: MW-85 **Direction:** MW-85 well sample at from 6-10 feet.	

Location: MW-85 **Direction:** MW-85 well sample at from 10-15 feet.	

Location: MW-85 **Direction:** MW-85 well sample at from 15-20 feet.	

Location: MW-85 **Direction:** MW-85 well sample at from 20-24 feet.	

Location: MW-85 **Direction:** MW-85 well sample at from 24-30 feet. At 24.5 feet rock layer like MW-84, and MW-86.	

Location: MW-85 **Direction:** MW-85 well sample at from 30-35 feet.	

Location: MW-85 **Direction:** MW-85 well sample of rock seam at 24.5 feet. Just like rock layer in MW-84, and MW-86.	

Location: MW-87 **Direction:** MW-87 samples from 6.0 to 10.0 feet.	

Location: MW-87 **Direction:** MW-87 samples from 12.5 to 15 feet.	

Location: MW-87 **Direction:** MW-87 samples from 15 to 19 feet.	

Location: MW-87 **Direction:** MW-87 samples from 17 to 21 feet.	

21

Location: MW-87 **Direction:** MW-87 samples from 21 to 25 feet.	

Location: MW-87 **Direction:** MW-87 samples from 25 to 30 feet.	

Location: MW-87 **Direction:** Samples from 30 to 35' in MW-87. Change in material at 34'	

Location: MW-87 **Direction:** Samples from 35 to 39' in MW-87.	

Location: MW-87 **Direction:** Samples from 39 to 43' in MW-87.	

Location: MW-87 **Direction:** Samples from 41 to 45' in MW-87	

DAILY FIELD REPORT (continued)

Location: MW-87 **Direction:** Cascade starting to set MW-87 well.	

Location: MW-87 **Direction:** Cascade completed setting MW-87.	

Location: MW-83 **Direction:** Cascade setting up MW-83 in the URS.	

Location: MW-83 **Direction:** Cascade began drilling MW-83.	 21

Location: MW-83 **Direction:** MW-83 samples from 6 to 10 feet.	

Location: MW-83 **Direction:** MW-83 samples from 10 to 15 feet.	

Location: MW-83 **Direction:** MW-83 samples from 15 to 19 feet.	

Location: MW-83 **Direction:** MW-83 samples from 19 to 23 feet.	

21

Location: MW-83 **Direction:** Samples from 25 to 30' in MW-83.	

Location: MW-83 **Direction:** Samples from 27.5' in MW-83.	

DAILY FIELD REPORT (continued)

Location: MW-83 **Direction:** Samples from 30 to 35' in MW-83.	

Location: MW-83 **Direction:** Cascade setting MW-83 well.	

Location: MW-83 **Direction:** MW-83 samples, samples from 6 to 21 feet.	

Location: MW-83 **Direction:** MW-83 samples, samples from 19 to 35 feet.	

Location: MW-83 **Direction:** Cascade place seal material on MW-83.	

Location: MW-83 **Direction:** MW-83 well set.	 21

DAILY FIELD REPORT (continued)

Location:	3. 
Direction: Looking east at MW-87 well monument.	

Location: APS URS **Direction:** Looking northwest at MW-85, well monument completed, well PVC needs to be trimmed.	

Location: APS URS **Direction:** Looking west at MW-84, well monument completed, well PVC needs to be trimmed.	

Location: APS URS **Direction:** Looking north at MW-83, well monument completed.	

Location: APS URS **Direction:** MW-83 well with dog tag marker.	

DAILY FIELD REPORT (continued)

Location: APS URS **Direction:** Looking north at MW-84, well monument completed.	

Location: APS URS **Direction:** Looking northwest at MW-85, well monument completed.	

Location: APS URS **Direction:** MW-85 well with dog tag marker..	

Location: APS URS **Direction:** Looking northwest at MW-86, well monument completed.	

Location: APS URS **Direction:** Checking turbidity in MW-86. Time of photo at 3:00.	

Location: APS URS **Direction:** Checking turbidity in MW-86. Time of photo at 3:36.	

DAILY FIELD REPORT (continued)

Location: APS URS	
Direction: Cascade developing MW-83. Purging MW-83.	

DAILY FIELD REPORT (continued)

Location: APS URS	
Direction: Cascade developing MW-85. Bailing MW-85.	

DAILY FIELD REPORT (continued)

Location: APS URS **Direction:** Final picture of MW-83, looking north.	

Location: APS URS **Direction:** Final picture of MW-84, looking northwest.	

Location: APS URS **Direction:** Final picture of MW-85, looking northwest.	

Location: APS URS **Direction:** Final picture of MW-86, looking northwest.	

APPENDIX C

Well Survey Results

Sakura Engineering & Surveying

Designing for Your Future

CIVIL•STRUCTURAL•MECHANICAL
SURVEYING•GEOTECHNICAL

NEW MEXICO WEST STATE PLANE COORDINATE SYSTEM NAD83
NAVD 88
CONTROL POINT- HV53 N2070581.505, E 2529275.542, ELEV 5331.214

MW 86) N 2070725.020, E 2534508.889 ELEV 5338.735 NORTH SIDE OF CONCRETE
5338.758 "X"NORTH SIDE OF PVC
5340.734 NORTH SIDE OF STEEL

MW 83) N 2071872.332, E 2533647.779 ELEV 5341.507 NORTH SIDE OF CONCRETE
5343.152 "X"NORTH SIDE OF PVC
5344.397 NORTH SIDE OF STEEL

MW 84) N 2070510.119, E 2534044.644 ELEV 5339.339 NORTH SIDE OF CONCRETE
5338.230 "X"NORTH SIDE OF PVC
5338.562 NORTH SIDE OF STEEL

MW 85) N 2070175.549, E 2533808.629 ELEV 5353.687 NORTH SIDE OF CONCRETE
5352.783 "X"NORTH SIDE OF PVC
5353.131 NORTH SIDE OF STEEL

MW 87) N 2067465.028, E 2521608.195 ELEV 5074.291 NORTH SIDE OF CONCRETE
5076.527 "X"NORTH SIDE OF PVC
5077.202 NORTH SIDE OF STEEL

MW 82) N 2071254.727, E 2522181.151 ELEV 5091.016 NORTH SIDE OF CONCRETE
5093.399 "X"NORTH SIDE OF PVC N
5093.369 "X"NORTH SIDE OF PVC S
5093.893 NORTH SIDE OF STEEL

MW 77) N 2072256.618, E 2522001.980 ELEV 5092.353 NORTH SIDE OF CONCRETE
DEEP 5094.974 "X"NORTH SIDE OF PVC N
5094.936 "X"NORTH SIDE OF PVC S
5095.294 NORTH SIDE OF STEEL

MW 78) N 2072286.120, E 2522168.181 ELEV 5086.514 NORTH SIDE OF CONCRETE
DEEP 5088.823 "X"NORTH SIDE OF PVC W
5088.787 "X"NORTH SIDE OF PVC E
5089.434 NORTH SIDE OF STEEL

125 West Main
Suite "A"
Farmington New Mexico 87401

MW 80) N 2071890.190, E 2522162.616 ELEV 5084.292 NORTH SIDE OF CONCRETE
5086.799 "X"NORTH SIDE OF PVC W
DEEP 5086.776 "X"NORTH SIDE OF PVC E
5087.243 NORTH SIDE OF STEEL
MW 81) N 2071638.399, E 2522164.510 ELEV 5084.066 NORTH SIDE OF CONCRETE
5086.410 "X"NORTH SIDE OF PVC
5086.983 NORTH SIDE OF STEEL
MW 79) N 2071892.380, E 2521988.551 ELEV 5084.353 NORTH SIDE OF CONCRETE
5086.903 "X"NORTH SIDE OF PVC E
DEEP 5086.955 "X"NORTH SIDE OF PVC W
5087.355 NORTH SIDE OF STEEL
MW 49A)N 2069724.973, E 2527814.572ELEV 5285.286 NORTH SIDE OF GROUND
5288.621 "X"NORTH SIDE OF PVC CAP
5288.933 NORTH SIDE OF STEEL
MW 31) N 2072695.657, E 2521955.236 ELEV 5089.958 NORTH SIDE OF CONCRETE
5092.588 "X"NORTH SIDE OF PVC
5092.999 NORTH SIDE OF STEEL
MW 30) N 2072222.859, E 2521960.815 ELEV 5092.064 NORTH SIDE OF CONCRETE
5091.669 "X"NORTH SIDE OF PVC
5092.094 NORTH SIDE OF STEEL
MW DMX1) N 2071870.472, E 2521916.019 ELEV 5097.489 NORTH SIDE OF CONC.
5098.019 "X"NORTH SIDE OF PVC
5098.659 NORTH SIDE OF STEEL

I, Scott A Martin, a New Mexico Professional Surveyor No. 21663, do hereby certify this Monitor Well Survey Report was prepared by me or under my supervision based on an actual survey on the ground that I am responsible for this survey; and that the survey and report meets the minimum standards for surveying in New Mexico.



125 West Main
Suite "A"
Farmington New Mexico 87401

APPENDIX D

Analytical Laboratory and Data Validation Reports

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING



ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Phoenix
4625 East Cotton Ctr Blvd
Suite 189
Phoenix, AZ 85040
Tel: (602)437-3340

TestAmerica Job ID: 550-115113-1
TestAmerica Sample Delivery Group: Cholla
Client Project/Site: CCR

For:
Arizona Public Service Company
4801 Cholla Lake Rd
Joseph City, Arizona 86032

Attn: Doug Lavarnway

Authorized for release by:
1/21/2019 12:23:02 PM

Ken Baker, Project Manager II
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Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

HPLC/IC

Qualifier	Qualifier Description
D1	Sample required dilution due to matrix.
D2	Sample required dilution due to high concentration of analyte.
D5	Minimum Reporting Limit (MRL) adjusted due to sample dilution; analyte was non-detect in the sample.

Metals

Qualifier	Qualifier Description
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated blank spike was acceptable.
D2	Sample required dilution due to high concentration of analyte.

General Chemistry

Qualifier	Qualifier Description
D2	Sample required dilution due to high concentration of analyte.
H5	This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.

Glossary

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

Job ID: 550-115113-1

Laboratory: TestAmerica Phoenix

Narrative

Job Narrative
550-115113-1

Comments
No additional comments.

Receipt
The samples were received on 12/18/2018 12:33 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.2º C and 3.7º C.

HPLC/IC
Method(s) 300.0: The following samples were diluted for Fluoride by method EPA 300.0 due to the nature of the sample matrix: FC-CCR-MW38R-121518 (550-115113-2), FC-CCR-MW57-121518 (550-115113-3), FC-CCR-MW17R-121718 (550-115113-5), FC-CCR-DMX4-121618 (550-115113-6), FC-CCR-FD02-121618 (550-115113-7), FC-CCR-MW56-121618 (550-115113-8) and FC-CCR-MW15-121618 (550-115113-9). The samples contained high concentrations of Chloride and Sulfate which exceeded the instrument's maximum column capacity. Fluoride was not detected in the diluted samples. As such, elevated reporting limits (RLs) have been provided and these data have been qualified with D1 and D5 flags.

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

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

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

Sample Summary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115113-1
SDG: Cholla

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
550-115113-1	FC-CCR-MW75-121518	Water	12/15/18 16:27	12/18/18 12:33
550-115113-2	FC-CCR-MW38R-121518	Water	12/15/18 14:14	12/18/18 12:33
550-115113-3	FC-CCR-MW57-121518	Water	12/15/18 13:15	12/18/18 12:33
550-115113-4	FC-CCR-MW61-121518	Water	12/15/18 15:39	12/18/18 12:33
550-115113-5	FC-CCR-MW17R-121718	Water	12/17/18 07:47	12/18/18 12:33
550-115113-6	FC-CCR-DMX4-121618	Water	12/16/18 12:41	12/18/18 12:33
550-115113-7	FC-CCR-FD02-121618	Water	12/16/18 12:41	12/18/18 12:33
550-115113-8	FC-CCR-MW56-121618	Water	12/16/18 14:17	12/18/18 12:33
550-115113-9	FC-CCR-MW15-121618	Water	12/16/18 09:51	12/18/18 12:33

Detection Summary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115113-1
SDG: Cholla

Client Sample ID: FC-CCR-MW75-121518 — Lab Sample ID: 550-115113-1

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	280	D2	200		mg/L	100		300.0	Total/NA
Fluoride	1.2	D1	0.80		mg/L	2		300.0	Total/NA
Sulfate	4300	D2	400		mg/L	200		300.0	Total/NA
Boron	25	M3	0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	450	M3	2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	220	M3	2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Potassium	21		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Sodium	1200	M3	0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Alkalinity as CaCO3	87		6.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	87		6.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	6600	D2	100		mg/L	1		SM 2540C	Total/NA
pH	8.4	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	12.6	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW38R-121518 — Lab Sample ID: 550-115113-2

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	440	D2	400		mg/L	200		300.0	Total/NA
Sulfate	8900	D2	400		mg/L	200		300.0	Total/NA
Boron	19		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	410		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	680		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Potassium	39		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Sodium	2500	D2	2.0		mg/L	4		200.7 Rev 4.4	Total/NA
Alkalinity as CaCO3	270		6.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	270		6.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	13000	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.6	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	7.8	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW57-121518 — Lab Sample ID: 550-115113-3

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	510	D2	400		mg/L	200		300.0	Total/NA
Sulfate	7800	D2	400		mg/L	200		300.0	Total/NA
Boron	2.1		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	430		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	610		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Potassium	42		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Sodium	2200		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Alkalinity as CaCO3	470		6.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	470		6.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	12000	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.5	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	9.6	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW61-121518 — Lab Sample ID: 550-115113-4

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	310	D2	200		mg/L	100		300.0	Total/NA

This Detection Summary does not include radiochemical test results.

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Client Sample ID: FC-CCR-MW61-121518 (Continued) — Lab Sample ID: 550-115113-4

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	1.3	D1	0.80		mg/L	2		300.0	Total/NA
Sulfate	3500	D2	400		mg/L	200		300.0	Total/NA
Boron	40		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	490		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	120		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Potassium	20		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Sodium	1000		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Alkalinity as CaCO3	85		6.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	75		6.0		mg/L	1		SM 2320B	Total/NA
Carbonate Alkalinity as CaCO3	9.8		6.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	5500	D2	100		mg/L	1		SM 2540C	Total/NA
pH	8.7	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	9.8	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW17R-121718 — Lab Sample ID: 550-115113-5

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	400	D2	400		mg/L	200		300.0	Total/NA
Sulfate	4000	D2	400		mg/L	200		300.0	Total/NA
Boron	38		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	450		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	260		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Potassium	19		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Sodium	1000		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Alkalinity as CaCO3	130		6.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	130		6.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	6200	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.5	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	9.6	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-DMX4-121618 — Lab Sample ID: 550-115113-6

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	780	D2	400		mg/L	200		300.0	Total/NA
Sulfate	9100	D2	400		mg/L	200		300.0	Total/NA
Boron	2.6		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	420		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	730		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Potassium	40		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Sodium	2800	D2	2.0		mg/L	4		200.7 Rev 4.4	Total/NA
Alkalinity as CaCO3	380		6.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	380		6.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	15000	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.7	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	9.8	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-FD02-121618 — Lab Sample ID: 550-115113-7

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	790	D2	400		mg/L	200		300.0	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115113-1
SDG: Cholla

Client Sample ID: FC-CCR-FD02-121618 (Continued) — Lab Sample ID: 550-115113-7

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Sulfate	9300	D2	400		mg/L	200		300.0	Total/NA
Boron	2.5		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	420		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	720		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Potassium	40		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Sodium	2900	D2	2.0		mg/L	4		200.7 Rev 4.4	Total/NA
Alkalinity as CaCO3	390		6.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	390		6.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	14000	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.7	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	10.5	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW56-121618 — Lab Sample ID: 550-115113-8

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	1500	D2	400		mg/L	200		300.0	Total/NA
Sulfate	12000	D2	400		mg/L	200		300.0	Total/NA
Boron	3.0		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	420		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	1300	D2	8.0		mg/L	4		200.7 Rev 4.4	Total/NA
Potassium	54		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Sodium	3400	D2	2.0		mg/L	4		200.7 Rev 4.4	Total/NA
Alkalinity as CaCO3	650		6.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	650		6.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	19000	D2	200		mg/L	1		SM 2540C	Total/NA
pH	7.1	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	10.1	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW15-121618 — Lab Sample ID: 550-115113-9

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	990	D2	400		mg/L	200		300.0	Total/NA
Sulfate	6500	D2	400		mg/L	200		300.0	Total/NA
Boron	8.8		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	440		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	550		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Potassium	38		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Sodium	2100		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Alkalinity as CaCO3	610		6.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	610		6.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	12000	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.2	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	11.2	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-MW75-121518

Lab Sample ID: 550-115113-1
Matrix: Water
Date Collected: 12/15/18 16:27
Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**280**	**D2**	200		mg/L			12/27/18 00:41	100
Fluoride	**1.2**	**D1**	0.80		mg/L			12/22/18 03:57	2
Sulfate	**4300**	**D2**	400		mg/L			12/22/18 04:52	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	**25**	**M3**	0.050		mg/L		12/20/18 10:34	12/29/18 02:09	1
Calcium	**450**	**M3**	2.0		mg/L		12/20/18 10:34	12/27/18 11:56	1
Magnesium	**220**	**M3**	2.0		mg/L		12/20/18 10:34	12/27/18 11:56	1
Potassium	**21**		0.50		mg/L		12/20/18 10:34	12/27/18 11:56	1
Sodium	**1200**	**M3**	0.50		mg/L		12/20/18 10:34	12/27/18 11:56	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	**87**		6.0		mg/L			12/19/18 14:35	1
Bicarbonate Alkalinity as CaCO3	**87**		6.0		mg/L			12/19/18 14:35	1
Carbonate Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 14:35	1
Alkalinity, Phenolphthalein	ND		6.0		mg/L			12/19/18 14:35	1
Hydroxide Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 14:35	1
Total Dissolved Solids	**6600**	**D2**	100		mg/L			12/19/18 11:51	1
pH	**8.4**	**H5**	1.7		SU			12/27/18 14:17	1
Temperature	**12.6**	**H5**	0.1		Degrees C			12/27/18 14:17	1

Client Sample ID: FC-CCR-MW38R-121518

Lab Sample ID: 550-115113-2
Matrix: Water
Date Collected: 12/15/18 14:14
Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**440**	**D2**	400		mg/L			12/22/18 01:48	200
Fluoride	ND	D1 D5	0.80		mg/L			12/22/18 01:30	2
Sulfate	**8900**	**D2**	400		mg/L			12/22/18 01:48	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	**19**		0.050		mg/L		12/20/18 10:34	12/29/18 03:22	1
Calcium	**410**		2.0		mg/L		12/20/18 10:34	12/27/18 12:45	1
Magnesium	**680**		2.0		mg/L		12/20/18 10:34	12/27/18 12:45	1
Potassium	**39**		0.50		mg/L		12/20/18 10:34	12/27/18 12:45	1
Sodium	**2500**	**D2**	2.0		mg/L		12/20/18 10:34	12/29/18 03:16	4

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	**270**		6.0		mg/L			12/19/18 14:53	1
Bicarbonate Alkalinity as CaCO3	**270**		6.0		mg/L			12/19/18 14:53	1
Carbonate Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 14:53	1
Alkalinity, Phenolphthalein	ND		6.0		mg/L			12/19/18 14:53	1
Hydroxide Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 14:53	1
Total Dissolved Solids	**13000**	**D2**	100		mg/L			12/19/18 11:51	1
pH	**7.6**	**H5**	1.7		SU			12/26/18 14:18	1

Client Sample ID: FC-CCR-MW38R-121518

Lab Sample ID: 550-115113-2
Date Collected: 12/15/18 14:14
Matrix: Water
Date Received: 12/18/18 12:33

General Chemistry (Continued)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Temperature	7.8	H5	0.1		Degrees C			12/26/18 14:18	1

Client Sample ID: FC-CCR-MW57-121518

Lab Sample ID: 550-115113-3
Date Collected: 12/15/18 13:15
Matrix: Water
Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	510	D2	400		mg/L			12/22/18 02:25	200
Fluoride	ND	D1 D5	0.80		mg/L			12/22/18 02:06	2
Sulfate	7800	D2	400		mg/L			12/22/18 02:25	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	2.1		0.050		mg/L		12/20/18 10:34	12/29/18 03:28	1
Calcium	430		2.0		mg/L		12/20/18 10:34	12/27/18 12:51	1
Magnesium	610		2.0		mg/L		12/20/18 10:34	12/27/18 12:51	1
Potassium	42		0.50		mg/L		12/20/18 10:34	12/27/18 12:51	1
Sodium	2200		0.50		mg/L		12/20/18 10:34	12/27/18 12:51	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	470		6.0		mg/L			12/19/18 15:03	1
Bicarbonate Alkalinity as CaCO3	470		6.0		mg/L			12/19/18 15:03	1
Carbonate Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 15:03	1
Alkalinity, Phenolphthalein	ND		6.0		mg/L			12/19/18 15:03	1
Hydroxide Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 15:03	1
Total Dissolved Solids	12000	D2	100		mg/L			12/19/18 11:51	1
pH	7.5	H5	1.7		SU			12/26/18 14:18	1
Temperature	9.6	H5	0.1		Degrees C			12/26/18 14:18	1

Client Sample ID: FC-CCR-MW61-121518

Lab Sample ID: 550-115113-4
Date Collected: 12/15/18 15:39
Matrix: Water
Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	310	D2	200		mg/L			12/26/18 23:27	100
Fluoride	1.3	D1	0.80		mg/L			12/22/18 02:43	2
Sulfate	3500	D2	400		mg/L			12/22/18 03:02	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	40		0.050		mg/L		12/20/18 10:34	12/29/18 03:39	1
Calcium	490		2.0		mg/L		12/20/18 10:34	12/27/18 12:57	1
Magnesium	120		2.0		mg/L		12/20/18 10:34	12/27/18 12:57	1
Potassium	20		0.50		mg/L		12/20/18 10:34	12/27/18 12:57	1
Sodium	1000		0.50		mg/L		12/20/18 10:34	12/27/18 12:57	1

Client Sample ID: FC-CCR-MW61-121518

Lab Sample ID: 550-115113-4
Date Collected: 12/15/18 15:39
Matrix: Water
Date Received: 12/18/18 12:33

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	85		6.0		mg/L			12/19/18 15:11	1
Bicarbonate Alkalinity as CaCO3	75		6.0		mg/L			12/19/18 15:11	1
Carbonate Alkalinity as CaCO3	9.8		6.0		mg/L			12/19/18 15:11	1
Alkalinity, Phenolphthalein	ND		6.0		mg/L			12/19/18 15:11	1
Hydroxide Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 15:11	1
Total Dissolved Solids	5500	D2	100		mg/L			12/19/18 11:51	1
pH	8.7	H5	1.7		SU			12/26/18 14:18	1
Temperature	9.8	H5	0.1		Degrees C			12/26/18 14:18	1

Client Sample ID: FC-CCR-MW17R-121718

Lab Sample ID: 550-115113-5
Date Collected: 12/17/18 07:47
Matrix: Water
Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	400	D2	400		mg/L			12/22/18 07:56	200
Fluoride	ND	D1 D5	0.80		mg/L			12/22/18 07:38	2
Sulfate	4000	D2	400		mg/L			12/22/18 07:56	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	38		0.050		mg/L		12/20/18 10:34	12/29/18 03:45	1
Calcium	450		2.0		mg/L		12/20/18 10:34	12/27/18 13:03	1
Magnesium	260		2.0		mg/L		12/20/18 10:34	12/27/18 13:03	1
Potassium	19		0.50		mg/L		12/20/18 10:34	12/27/18 13:03	1
Sodium	1000		0.50		mg/L		12/20/18 10:34	12/27/18 13:03	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	130		6.0		mg/L			12/19/18 15:19	1
Bicarbonate Alkalinity as CaCO3	130		6.0		mg/L			12/19/18 15:19	1
Carbonate Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 15:19	1
Alkalinity, Phenolphthalein	ND		6.0		mg/L			12/19/18 15:19	1
Hydroxide Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 15:19	1
Total Dissolved Solids	6200	D2	100		mg/L			12/19/18 11:56	1
pH	7.5	H5	1.7		SU			12/26/18 14:18	1
Temperature	9.6	H5	0.1		Degrees C			12/26/18 14:18	1

Client Sample ID: FC-CCR-DMX4-121618

Lab Sample ID: 550-115113-6
Date Collected: 12/16/18 12:41
Matrix: Water
Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	780	D2	400		mg/L			12/22/18 08:33	200
Fluoride	ND	D1 D5	0.80		mg/L			12/22/18 08:15	2
Sulfate	9100	D2	400		mg/L			12/22/18 08:33	200

Client Sample ID: FC-CCR-DMX4-121618

Lab Sample ID: 550-115113-6
Date Collected: 12/16/18 12:41
Matrix: Water
Date Received: 12/18/18 12:33

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	2.6		0.050		mg/L		12/20/18 10:34	12/29/18 03:57	1
Calcium	420		2.0		mg/L		12/20/18 10:34	12/27/18 13:09	1
Magnesium	730		2.0		mg/L		12/20/18 10:34	12/27/18 13:09	1
Potassium	40		0.50		mg/L		12/20/18 10:34	12/27/18 13:09	1
Sodium	2800	D2	2.0		mg/L		12/20/18 10:34	12/29/18 03:51	4

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	380		6.0		mg/L			12/19/18 15:30	1
Bicarbonate Alkalinity as CaCO3	380		6.0		mg/L			12/19/18 15:30	1
Carbonate Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 15:30	1
Alkalinity, Phenolphthalein	ND		6.0		mg/L			12/19/18 15:30	1
Hydroxide Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 15:30	1
Total Dissolved Solids	15000	D2	100		mg/L			12/19/18 11:51	1
pH	7.7	H5	1.7		SU			12/26/18 14:18	1
Temperature	9.8	H5	0.1		Degrees C			12/26/18 14:18	1

Client Sample ID: FC-CCR-FD02-121618

Lab Sample ID: 550-115113-7
Date Collected: 12/16/18 12:41
Matrix: Water
Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	790	D2	400		mg/L			12/22/18 09:10	200
Fluoride	ND	D1 D5	0.80		mg/L			12/22/18 08:51	2
Sulfate	9300	D2	400		mg/L			12/22/18 09:10	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	2.5		0.050		mg/L		12/20/18 10:34	12/29/18 04:09	1
Calcium	420		2.0		mg/L		12/20/18 10:34	12/27/18 13:20	1
Magnesium	720		2.0		mg/L		12/20/18 10:34	12/27/18 13:20	1
Potassium	40		0.50		mg/L		12/20/18 10:34	12/27/18 13:20	1
Sodium	2900	D2	2.0		mg/L		12/20/18 10:34	12/29/18 04:03	4

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	390		6.0		mg/L			12/19/18 15:40	1
Bicarbonate Alkalinity as CaCO3	390		6.0		mg/L			12/19/18 15:40	1
Carbonate Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 15:40	1
Alkalinity, Phenolphthalein	ND		6.0		mg/L			12/19/18 15:40	1
Hydroxide Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 15:40	1
Total Dissolved Solids	14000	D2	100		mg/L			12/19/18 11:51	1
pH	7.7	H5	1.7		SU			12/26/18 14:18	1
Temperature	10.5	H5	0.1		Degrees C			12/26/18 14:18	1

Client Sample ID: FC-CCR-MW56-121618

Lab Sample ID: 550-115113-8

Date Collected: 12/16/18 14:17

Matrix: Water

Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1500**	**D2**	400		mg/L			12/22/18 09:47	200
Fluoride	ND	D1 D5	0.80		mg/L			12/22/18 09:28	2
Sulfate	**12000**	**D2**	400		mg/L			12/22/18 09:47	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	**3.0**		0.050		mg/L		12/20/18 10:34	12/29/18 04:20	1
Calcium	**420**		2.0		mg/L		12/20/18 10:34	12/27/18 13:26	1
Magnesium	**1300**	**D2**	8.0		mg/L		12/20/18 10:34	12/29/18 04:15	4
Potassium	**54**		0.50		mg/L		12/20/18 10:34	12/27/18 13:26	1
Sodium	**3400**	**D2**	2.0		mg/L		12/20/18 10:34	12/29/18 04:15	4

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	**650**		6.0		mg/L			12/19/18 16:24	1
Bicarbonate Alkalinity as CaCO3	**650**		6.0		mg/L			12/19/18 16:24	1
Carbonate Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 16:24	1
Alkalinity, Phenolphthalein	ND		6.0		mg/L			12/19/18 16:24	1
Hydroxide Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 16:24	1
Total Dissolved Solids	**19000**	**D2**	200		mg/L			12/19/18 11:51	1
pH	**7.1**	**H5**	1.7		SU			12/26/18 14:18	1
Temperature	**10.1**	**H5**	0.1		Degrees C			12/26/18 14:18	1

Client Sample ID: FC-CCR-MW15-121618

Lab Sample ID: 550-115113-9

Date Collected: 12/16/18 09:51

Matrix: Water

Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**990**	**D2**	400		mg/L			12/22/18 10:23	200
Fluoride	ND	D1 D5	0.80		mg/L			12/22/18 10:05	2
Sulfate	**6500**	**D2**	400		mg/L			12/22/18 10:23	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	**8.8**		0.050		mg/L		12/20/18 10:34	12/29/18 04:26	1
Calcium	**440**		2.0		mg/L		12/20/18 10:34	12/27/18 13:32	1
Magnesium	**550**		2.0		mg/L		12/20/18 10:34	12/27/18 13:32	1
Potassium	**38**		0.50		mg/L		12/20/18 10:34	12/27/18 13:32	1
Sodium	**2100**		0.50		mg/L		12/20/18 10:34	12/27/18 13:32	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	**610**		6.0		mg/L			12/19/18 16:36	1
Bicarbonate Alkalinity as CaCO3	**610**		6.0		mg/L			12/19/18 16:36	1
Carbonate Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 16:36	1
Alkalinity, Phenolphthalein	ND		6.0		mg/L			12/19/18 16:36	1
Hydroxide Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 16:36	1
Total Dissolved Solids	**12000**	**D2**	100		mg/L			12/19/18 11:51	1
pH	**7.2**	**H5**	1.7		SU			12/26/18 14:18	1

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115113-1
SDG: Cholla

Client Sample ID: FC-CCR-MW15-121618
Date Collected: 12/16/18 09:51
Date Received: 12/18/18 12:33

Lab Sample ID: 550-115113-9
Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Temperature	11.2	H5	0.1		Degrees C			12/26/18 14:18	1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 550-165329/2
Matrix: Water
Analysis Batch: 165329

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		2.0		mg/L			12/21/18 19:03	1
Fluoride	ND		0.40		mg/L			12/21/18 19:03	1
Sulfate	ND		2.0		mg/L			12/21/18 19:03	1

Lab Sample ID: LCS 550-165329/5
Matrix: Water
Analysis Batch: 165329

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride			20.0	20.9		mg/L		105	90 - 110		
Fluoride			4.00	4.06		mg/L		101	90 - 110		
Sulfate			20.0	20.0		mg/L		100	90 - 110		

Lab Sample ID: LCSD 550-165329/6
Matrix: Water
Analysis Batch: 165329

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride			20.0	21.0		mg/L		105	90 - 110	0	20
Fluoride			4.00	4.06		mg/L		101	90 - 110	0	20
Sulfate			20.0	20.1		mg/L		100	90 - 110	0	20

Lab Sample ID: 550-115113-1 MS
Matrix: Water
Analysis Batch: 165329

Client Sample ID: FC-CCR-MW75-121518
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride	1.2		8.00	9.53	D1	mg/L		103	80 - 120		

Lab Sample ID: 550-115113-1 MS
Matrix: Water
Analysis Batch: 165329

Client Sample ID: FC-CCR-MW75-121518
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfate	4300	D2	4000	8450	D2	mg/L		103	80 - 120		

Lab Sample ID: 550-115113-1 MSD
Matrix: Water
Analysis Batch: 165329

Client Sample ID: FC-CCR-MW75-121518
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	1.2		8.00	9.49	D1	mg/L		103	80 - 120	0	20

Lab Sample ID: 550-115113-1 MSD
Matrix: Water
Analysis Batch: 165329

Client Sample ID: FC-CCR-MW75-121518
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	4300	D2	4000	8420	D2	mg/L		102	80 - 120	NC	20

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 550-115114-B-1 MS ^200
Matrix: Water
Analysis Batch: 165329

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	3400	D2	4000	7370	D2	mg/L		100	80 - 120

Lab Sample ID: 550-115114-B-1 MSD ^200
Matrix: Water
Analysis Batch: 165329

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	3400	D2	4000	7350	D2	mg/L		100	80 - 120	0	20

Lab Sample ID: 550-115115-B-1 MS ^200
Matrix: Water
Analysis Batch: 165329

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2300	D2	4000	6670	D2	mg/L		109	80 - 120
Sulfate	14000	D2	4000	17200	D2	mg/L		86	80 - 120

Lab Sample ID: 550-115115-B-1 MSD ^200
Matrix: Water
Analysis Batch: 165329

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	2300	D2	4000	6640	D2	mg/L		108	80 - 120	0	20
Sulfate	14000	D2	4000	17100	D2	mg/L		84	80 - 120	0	20

Lab Sample ID: MB 550-165473/1024
Matrix: Water
Analysis Batch: 165473

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

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		2.0	mg/L			12/26/18 20:42	1
Fluoride	ND		0.40	mg/L			12/26/18 20:42	1
Sulfate	ND		2.0	mg/L			12/26/18 20:42	1

Lab Sample ID: LCS 550-165473/25
Matrix: Water
Analysis Batch: 165473

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	21.3		mg/L		106	90 - 110
Fluoride	4.00	4.09		mg/L		102	90 - 110
Sulfate	20.0	20.3		mg/L		101	90 - 110

Lab Sample ID: LCSD 550-165473/26
Matrix: Water
Analysis Batch: 165473

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	20.0	21.3		mg/L		106	90 - 110	0	20

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCSD 550-165473/26
Matrix: Water
Analysis Batch: 165473

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride			4.00	4.10		mg/L		102	90 - 110	0	20
Sulfate			20.0	20.3		mg/L		102	90 - 110	0	20

Lab Sample ID: 550-115113-1 MS
Matrix: Water
Analysis Batch: 165473

Client Sample ID: FC-CCR-MW75-121518
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride	280	D2	2000	2430	D2	mg/L		108	80 - 120		

Lab Sample ID: 550-115113-1 MSD
Matrix: Water
Analysis Batch: 165473

Client Sample ID: FC-CCR-MW75-121518
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	280	D2	2000	2430	D2	mg/L		108	80 - 120	0	20

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 550-164986/1-A
Matrix: Water
Analysis Batch: 165571

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 164986

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Calcium	ND		2.0		mg/L		12/20/18 10:34	12/27/18 11:36	1
Magnesium	ND		2.0		mg/L		12/20/18 10:34	12/27/18 11:36	1
Potassium	ND		0.50		mg/L		12/20/18 10:34	12/27/18 11:36	1
Sodium	ND		0.50		mg/L		12/20/18 10:34	12/27/18 11:36	1

Lab Sample ID: LCS 550-164986/2-A
Matrix: Water
Analysis Batch: 165571

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 164986

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Calcium			21.0	22.0		mg/L		105	85 - 115		
Magnesium			21.0	21.2		mg/L		101	85 - 115		
Potassium			20.0	20.2		mg/L		101	85 - 115		
Sodium			20.0	19.9		mg/L		99	85 - 115		

Lab Sample ID: LCSD 550-164986/3-A
Matrix: Water
Analysis Batch: 165571

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 164986

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Calcium			21.0	21.6		mg/L		103	85 - 115	2	20
Magnesium			21.0	20.9		mg/L		100	85 - 115	2	20
Potassium			20.0	19.9		mg/L		100	85 - 115	2	20
Sodium			20.0	19.5		mg/L		98	85 - 115	2	20

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: 550-115113-1 MS — **Client Sample ID: FC-CCR-MW75-121518**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 165571 — **Prep Batch: 164986**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Calcium	450	M3	21.0	471	M3	mg/L		86	70 - 130
Magnesium	220	M3	21.0	243	M3	mg/L		101	70 - 130
Potassium	21		20.0	42.8		mg/L		107	70 - 130
Sodium	1200	M3	20.0	1250	M3	mg/L		220	70 - 130

Lab Sample ID: 550-115113-1 MS — **Client Sample ID: FC-CCR-MW75-121518**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 165722 — **Prep Batch: 164986**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	25	M3	1.00	25.3	M3	mg/L		34	70 - 130

Lab Sample ID: 550-115113-1 MSD — **Client Sample ID: FC-CCR-MW75-121518**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 165571 — **Prep Batch: 164986**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Calcium	450	M3	21.0	447	M3	mg/L		-32	70 - 130	5	20
Magnesium	220	M3	21.0	229	M3	mg/L		36	70 - 130	6	20
Potassium	21		20.0	40.5		mg/L		95	70 - 130	6	20
Sodium	1200	M3	20.0	1150	M3	mg/L		-278	70 - 130	8	20

Lab Sample ID: 550-115113-1 MSD — **Client Sample ID: FC-CCR-MW75-121518**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 165722 — **Prep Batch: 164986**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	25	M3	1.00	24.4	M3	mg/L		-62	70 - 130	4	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 550-164955/5 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 164955

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 14:01	1
Bicarbonate Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 14:01	1
Carbonate Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 14:01	1
Alkalinity, Phenolphthalein	ND		6.0		mg/L			12/19/18 14:01	1
Hydroxide Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 14:01	1

Lab Sample ID: LCS 550-164955/4 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 164955

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity as CaCO3			250	249		mg/L		100	90 - 110

Method: SM 2320B - Alkalinity (Continued)

Lab Sample ID: LCSD 550-164955/17
Matrix: Water
Analysis Batch: 164955

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Alkalinity as CaCO3			250	259		mg/L		104	90 - 110	4	20

Lab Sample ID: 550-115104-C-1 DU
Matrix: Water
Analysis Batch: 164955

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Alkalinity as CaCO3	24			26.1		mg/L				6	20
Bicarbonate Alkalinity as CaCO3	24			26.1		mg/L				6	20
Carbonate Alkalinity as CaCO3	ND			ND		mg/L				NC	20
Alkalinity, Phenolphthalein	ND			ND		mg/L				NC	20
Hydroxide Alkalinity as CaCO3	ND			ND		mg/L				NC	20

Lab Sample ID: 550-115113-1 DU
Matrix: Water
Analysis Batch: 164955

Client Sample ID: FC-CCR-MW75-121518
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Alkalinity as CaCO3	87			86.6		mg/L				0.9	20
Bicarbonate Alkalinity as CaCO3	87			86.6		mg/L				0.9	20
Carbonate Alkalinity as CaCO3	ND			ND		mg/L				NC	20
Alkalinity, Phenolphthalein	ND			ND		mg/L				NC	20
Hydroxide Alkalinity as CaCO3	ND			ND		mg/L				NC	20

Lab Sample ID: 550-115114-A-1 DU
Matrix: Water
Analysis Batch: 164955

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Alkalinity as CaCO3	250			242		mg/L				1	20
Bicarbonate Alkalinity as CaCO3	250			242		mg/L				1	20
Carbonate Alkalinity as CaCO3	ND			ND		mg/L				NC	20
Alkalinity, Phenolphthalein	ND			ND		mg/L				NC	20
Hydroxide Alkalinity as CaCO3	ND			ND		mg/L				NC	20

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

Lab Sample ID: MB 550-164875/1
Matrix: Water
Analysis Batch: 164875

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		20		mg/L			12/19/18 11:51	1

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

Lab Sample ID: LCS 550-164875/2
Matrix: Water
Analysis Batch: 164875

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Dissolved Solids			1000	972		mg/L		97	90 - 110		

Lab Sample ID: LCSD 550-164875/3
Matrix: Water
Analysis Batch: 164875

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids			1000	974		mg/L		97	90 - 110	0	10

Lab Sample ID: 550-115113-1 DU
Matrix: Water
Analysis Batch: 164875

Client Sample ID: FC-CCR-MW75-121518
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	6600	D2		6310	D2	mg/L				4	10

Lab Sample ID: 550-115114-B-1 DU
Matrix: Water
Analysis Batch: 164875

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	5200	D2		5060	D2	mg/L				3	10

Lab Sample ID: MB 550-164877/1
Matrix: Water
Analysis Batch: 164877

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		20		mg/L			12/19/18 11:56	1

Lab Sample ID: LCS 550-164877/2
Matrix: Water
Analysis Batch: 164877

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Dissolved Solids			1000	966		mg/L		97	90 - 110		

Lab Sample ID: LCSD 550-164877/3
Matrix: Water
Analysis Batch: 164877

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids			1000	976		mg/L		98	90 - 110	1	10

Lab Sample ID: 550-115116-A-1 DU
Matrix: Water
Analysis Batch: 164877

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	ND			ND		mg/L				NC	10

Method: SM 4500 H+ B - pH

Lab Sample ID: LCSSRM 550-165356/1
Matrix: Water
Analysis Batch: 165356

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

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.0		SU		99.9	98.5 - 101.5

Lab Sample ID: LCSSRM 550-165356/13
Matrix: Water
Analysis Batch: 165356

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

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.0		SU		100.0	98.5 - 101.5

Lab Sample ID: 550-115114-B-1 DU
Matrix: Water
Analysis Batch: 165356

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	7.5	H5	7.5	H5	SU		0.1	5
Temperature	10.6	H5	11.0	H5	Degrees C		4	

Lab Sample ID: LCSSRM 550-165497/1
Matrix: Water
Analysis Batch: 165497

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

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.0		SU		99.9	98.5 - 101.5

Lab Sample ID: LCSSRM 550-165497/13
Matrix: Water
Analysis Batch: 165497

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

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.0		SU		100.4	98.5 - 101.5

Lab Sample ID: 550-115113-1 DU
Matrix: Water
Analysis Batch: 165497

Client Sample ID: FC-CCR-MW75-121518
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	8.4	H5	8.3	H5	SU		0.2	5
Temperature	12.6	H5	11.5	H5	Degrees C		9	

HPLC/IC

Analysis Batch: 165329

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115113-1	FC-CCR-MW75-121518	Total/NA	Water	300.0	
550-115113-1	FC-CCR-MW75-121518	Total/NA	Water	300.0	
550-115113-2	FC-CCR-MW38R-121518	Total/NA	Water	300.0	
550-115113-2	FC-CCR-MW38R-121518	Total/NA	Water	300.0	
550-115113-3	FC-CCR-MW57-121518	Total/NA	Water	300.0	
550-115113-3	FC-CCR-MW57-121518	Total/NA	Water	300.0	
550-115113-4	FC-CCR-MW61-121518	Total/NA	Water	300.0	
550-115113-4	FC-CCR-MW61-121518	Total/NA	Water	300.0	
550-115113-5	FC-CCR-MW17R-121718	Total/NA	Water	300.0	
550-115113-5	FC-CCR-MW17R-121718	Total/NA	Water	300.0	
550-115113-6	FC-CCR-DMX4-121618	Total/NA	Water	300.0	
550-115113-6	FC-CCR-DMX4-121618	Total/NA	Water	300.0	
550-115113-7	FC-CCR-FD02-121618	Total/NA	Water	300.0	
550-115113-7	FC-CCR-FD02-121618	Total/NA	Water	300.0	
550-115113-8	FC-CCR-MW56-121618	Total/NA	Water	300.0	
550-115113-8	FC-CCR-MW56-121618	Total/NA	Water	300.0	
550-115113-9	FC-CCR-MW15-121618	Total/NA	Water	300.0	
550-115113-9	FC-CCR-MW15-121618	Total/NA	Water	300.0	
MB 550-165329/2	Method Blank	Total/NA	Water	300.0	
LCS 550-165329/5	Lab Control Sample	Total/NA	Water	300.0	
LCSD 550-165329/6	Lab Control Sample Dup	Total/NA	Water	300.0	
550-115113-1 MS	FC-CCR-MW75-121518	Total/NA	Water	300.0	
550-115113-1 MS	FC-CCR-MW75-121518	Total/NA	Water	300.0	
550-115113-1 MSD	FC-CCR-MW75-121518	Total/NA	Water	300.0	
550-115113-1 MSD	FC-CCR-MW75-121518	Total/NA	Water	300.0	
550-115114-B-1 MS ^200	Matrix Spike	Total/NA	Water	300.0	
550-115114-B-1 MSD ^200	Matrix Spike Duplicate	Total/NA	Water	300.0	
550-115115-B-1 MS ^200	Matrix Spike	Total/NA	Water	300.0	
550-115115-B-1 MSD ^200	Matrix Spike Duplicate	Total/NA	Water	300.0	

Analysis Batch: 165473

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115113-1	FC-CCR-MW75-121518	Total/NA	Water	300.0	
550-115113-4	FC-CCR-MW61-121518	Total/NA	Water	300.0	
MB 550-165473/1024	Method Blank	Total/NA	Water	300.0	
LCS 550-165473/25	Lab Control Sample	Total/NA	Water	300.0	
LCSD 550-165473/26	Lab Control Sample Dup	Total/NA	Water	300.0	
550-115113-1 MS	FC-CCR-MW75-121518	Total/NA	Water	300.0	
550-115113-1 MSD	FC-CCR-MW75-121518	Total/NA	Water	300.0	

Metals

Prep Batch: 164986

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115113-1	FC-CCR-MW75-121518	Total/NA	Water	200.7	
550-115113-2	FC-CCR-MW38R-121518	Total/NA	Water	200.7	
550-115113-3	FC-CCR-MW57-121518	Total/NA	Water	200.7	
550-115113-4	FC-CCR-MW61-121518	Total/NA	Water	200.7	
550-115113-5	FC-CCR-MW17R-121718	Total/NA	Water	200.7	
550-115113-6	FC-CCR-DMX4-121618	Total/NA	Water	200.7	

Metals (Continued)

Prep Batch: 164986 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115113-7	FC-CCR-FD02-121618	Total/NA	Water	200.7	
550-115113-8	FC-CCR-MW56-121618	Total/NA	Water	200.7	
550-115113-9	FC-CCR-MW15-121618	Total/NA	Water	200.7	
MB 550-164986/1-A	Method Blank	Total/NA	Water	200.7	
LCS 550-164986/2-A	Lab Control Sample	Total/NA	Water	200.7	
LCSD 550-164986/3-A	Lab Control Sample Dup	Total/NA	Water	200.7	
550-115113-1 MS	FC-CCR-MW75-121518	Total/NA	Water	200.7	
550-115113-1 MSD	FC-CCR-MW75-121518	Total/NA	Water	200.7	

Analysis Batch: 165571

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115113-1	FC-CCR-MW75-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-2	FC-CCR-MW38R-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-3	FC-CCR-MW57-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-4	FC-CCR-MW61-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-5	FC-CCR-MW17R-121718	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-6	FC-CCR-DMX4-121618	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-7	FC-CCR-FD02-121618	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-8	FC-CCR-MW56-121618	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-9	FC-CCR-MW15-121618	Total/NA	Water	200.7 Rev 4.4	164986
MB 550-164986/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	164986
LCS 550-164986/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	164986
LCSD 550-164986/3-A	Lab Control Sample Dup	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-1 MS	FC-CCR-MW75-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-1 MSD	FC-CCR-MW75-121518	Total/NA	Water	200.7 Rev 4.4	164986

Analysis Batch: 165722

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115113-1	FC-CCR-MW75-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-2	FC-CCR-MW38R-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-2	FC-CCR-MW38R-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-3	FC-CCR-MW57-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-4	FC-CCR-MW61-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-5	FC-CCR-MW17R-121718	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-6	FC-CCR-DMX4-121618	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-6	FC-CCR-DMX4-121618	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-7	FC-CCR-FD02-121618	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-7	FC-CCR-FD02-121618	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-8	FC-CCR-MW56-121618	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-8	FC-CCR-MW56-121618	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-9	FC-CCR-MW15-121618	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-1 MS	FC-CCR-MW75-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-1 MSD	FC-CCR-MW75-121518	Total/NA	Water	200.7 Rev 4.4	164986

General Chemistry

Analysis Batch: 164875

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115113-1	FC-CCR-MW75-121518	Total/NA	Water	SM 2540C	
550-115113-2	FC-CCR-MW38R-121518	Total/NA	Water	SM 2540C	

General Chemistry (Continued)

Analysis Batch: 164875 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115113-3	FC-CCR-MW57-121518	Total/NA	Water	SM 2540C	
550-115113-4	FC-CCR-MW61-121518	Total/NA	Water	SM 2540C	
550-115113-6	FC-CCR-DMX4-121618	Total/NA	Water	SM 2540C	
550-115113-7	FC-CCR-FD02-121618	Total/NA	Water	SM 2540C	
550-115113-8	FC-CCR-MW56-121618	Total/NA	Water	SM 2540C	
550-115113-9	FC-CCR-MW15-121618	Total/NA	Water	SM 2540C	
MB 550-164875/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 550-164875/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 550-164875/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	
550-115113-1 DU	FC-CCR-MW75-121518	Total/NA	Water	SM 2540C	
550-115114-B-1 DU	Duplicate	Total/NA	Water	SM 2540C	

Analysis Batch: 164877

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115113-5	FC-CCR-MW17R-121718	Total/NA	Water	SM 2540C	
MB 550-164877/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 550-164877/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 550-164877/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	
550-115116-A-1 DU	Duplicate	Total/NA	Water	SM 2540C	

Analysis Batch: 164955

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115113-1	FC-CCR-MW75-121518	Total/NA	Water	SM 2320B	
550-115113-2	FC-CCR-MW38R-121518	Total/NA	Water	SM 2320B	
550-115113-3	FC-CCR-MW57-121518	Total/NA	Water	SM 2320B	
550-115113-4	FC-CCR-MW61-121518	Total/NA	Water	SM 2320B	
550-115113-5	FC-CCR-MW17R-121718	Total/NA	Water	SM 2320B	
550-115113-6	FC-CCR-DMX4-121618	Total/NA	Water	SM 2320B	
550-115113-7	FC-CCR-FD02-121618	Total/NA	Water	SM 2320B	
550-115113-8	FC-CCR-MW56-121618	Total/NA	Water	SM 2320B	
550-115113-9	FC-CCR-MW15-121618	Total/NA	Water	SM 2320B	
MB 550-164955/5	Method Blank	Total/NA	Water	SM 2320B	
LCS 550-164955/4	Lab Control Sample	Total/NA	Water	SM 2320B	
LCSD 550-164955/17	Lab Control Sample Dup	Total/NA	Water	SM 2320B	
550-115104-C-1 DU	Duplicate	Total/NA	Water	SM 2320B	
550-115113-1 DU	FC-CCR-MW75-121518	Total/NA	Water	SM 2320B	
550-115114-A-1 DU	Duplicate	Total/NA	Water	SM 2320B	

Analysis Batch: 165356

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115113-2	FC-CCR-MW38R-121518	Total/NA	Water	SM 4500 H+ B	
550-115113-3	FC-CCR-MW57-121518	Total/NA	Water	SM 4500 H+ B	
550-115113-4	FC-CCR-MW61-121518	Total/NA	Water	SM 4500 H+ B	
550-115113-5	FC-CCR-MW17R-121718	Total/NA	Water	SM 4500 H+ B	
550-115113-6	FC-CCR-DMX4-121618	Total/NA	Water	SM 4500 H+ B	
550-115113-7	FC-CCR-FD02-121618	Total/NA	Water	SM 4500 H+ B	
550-115113-8	FC-CCR-MW56-121618	Total/NA	Water	SM 4500 H+ B	
550-115113-9	FC-CCR-MW15-121618	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-165356/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-165356/13	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
550-115114-B-1 DU	Duplicate	Total/NA	Water	SM 4500 H+ B	

QC Association Summary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115113-1
SDG: Cholla

Analysis Batch: 165497

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115113-1	FC-CCR-MW75-121518	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-165497/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-165497/13	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
550-115113-1 DU	FC-CCR-MW75-121518	Total/NA	Water	SM 4500 H+ B	

Client Sample ID: FC-CCR-MW75-121518
Date Collected: 12/15/18 16:27
Date Received: 12/18/18 12:33

Lab Sample ID: 550-115113-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/22/18 03:57	NEL	TAL PHX
Total/NA	Analysis	300.0		200	165329	12/22/18 04:52	NEL	TAL PHX
Total/NA	Analysis	300.0		100	165473	12/27/18 00:41	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 11:56	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165722	12/29/18 02:09	SRA	TAL PHX
Total/NA	Analysis	SM 2320B		1	164955	12/19/18 14:35	DGS	TAL PHX
Total/NA	Analysis	SM 2540C		1	164875		YET	TAL PHX
					(Start)	12/19/18 11:51		
					(End)	12/20/18 09:05		
Total/NA	Analysis	SM 4500 H+ B		1	165497	12/27/18 14:17	MRR	TAL PHX

Client Sample ID: FC-CCR-MW38R-121518
Date Collected: 12/15/18 14:14
Date Received: 12/18/18 12:33

Lab Sample ID: 550-115113-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/22/18 01:30	NEL	TAL PHX
Total/NA	Analysis	300.0		200	165329	12/22/18 01:48	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 12:45	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		4	165722	12/29/18 03:16	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165722	12/29/18 03:22	SRA	TAL PHX
Total/NA	Analysis	SM 2320B		1	164955	12/19/18 14:53	DGS	TAL PHX
Total/NA	Analysis	SM 2540C		1	164875		YET	TAL PHX
					(Start)	12/19/18 11:51		
					(End)	12/20/18 09:05		
Total/NA	Analysis	SM 4500 H+ B		1	165356	12/26/18 14:18	MRR	TAL PHX

Client Sample ID: FC-CCR-MW57-121518
Date Collected: 12/15/18 13:15
Date Received: 12/18/18 12:33

Lab Sample ID: 550-115113-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/22/18 02:06	NEL	TAL PHX
Total/NA	Analysis	300.0		200	165329	12/22/18 02:25	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 12:51	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115113-1
SDG: Cholla

Client Sample ID: FC-CCR-MW57-121518
Date Collected: 12/15/18 13:15
Date Received: 12/18/18 12:33

Lab Sample ID: 550-115113-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	200.7 Rev 4.4		1	165722	12/29/18 03:28	SRA	TAL PHX
Total/NA	Analysis	SM 2320B		1	164955	12/19/18 15:03	DGS	TAL PHX
Total/NA	Analysis	SM 2540C		1	164875		YET	TAL PHX
					(Start)	12/19/18 11:51		
					(End)	12/20/18 09:05		
Total/NA	Analysis	SM 4500 H+ B		1	165356	12/26/18 14:18	MRR	TAL PHX

Client Sample ID: FC-CCR-MW61-121518
Date Collected: 12/15/18 15:39
Date Received: 12/18/18 12:33

Lab Sample ID: 550-115113-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/22/18 02:43	NEL	TAL PHX
Total/NA	Analysis	300.0		200	165329	12/22/18 03:02	NEL	TAL PHX
Total/NA	Analysis	300.0		100	165473	12/26/18 23:27	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 12:57	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165722	12/29/18 03:39	SRA	TAL PHX
Total/NA	Analysis	SM 2320B		1	164955	12/19/18 15:11	DGS	TAL PHX
Total/NA	Analysis	SM 2540C		1	164875		YET	TAL PHX
					(Start)	12/19/18 11:51		
					(End)	12/20/18 09:05		
Total/NA	Analysis	SM 4500 H+ B		1	165356	12/26/18 14:18	MRR	TAL PHX

Client Sample ID: FC-CCR-MW17R-121718
Date Collected: 12/17/18 07:47
Date Received: 12/18/18 12:33

Lab Sample ID: 550-115113-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/22/18 07:38	NEL	TAL PHX
Total/NA	Analysis	300.0		200	165329	12/22/18 07:56	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 13:03	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165722	12/29/18 03:45	SRA	TAL PHX
Total/NA	Analysis	SM 2320B		1	164955	12/19/18 15:19	DGS	TAL PHX
Total/NA	Analysis	SM 2540C		1	164877		YET	TAL PHX
					(Start)	12/19/18 11:56		
					(End)	12/20/18 10:00		
Total/NA	Analysis	SM 4500 H+ B		1	165356	12/26/18 14:18	MRR	TAL PHX

Client Sample ID: FC-CCR-DMX4-121618

Lab Sample ID: 550-115113-6

Date Collected: 12/16/18 12:41

Matrix: Water

Date Received: 12/18/18 12:33

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/22/18 08:15	NEL	TAL PHX
Total/NA	Analysis	300.0		200	165329	12/22/18 08:33	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 13:09	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		4	165722	12/29/18 03:51	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165722	12/29/18 03:57	SRA	TAL PHX
Total/NA	Analysis	SM 2320B		1	164955	12/19/18 15:30	DGS	TAL PHX
Total/NA	Analysis	SM 2540C		1	164875		YET	TAL PHX
					(Start)	12/19/18 11:51		
					(End)	12/20/18 09:05		
Total/NA	Analysis	SM 4500 H+ B		1	165356	12/26/18 14:18	MRR	TAL PHX

Client Sample ID: FC-CCR-FD02-121618

Lab Sample ID: 550-115113-7

Date Collected: 12/16/18 12:41

Matrix: Water

Date Received: 12/18/18 12:33

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/22/18 08:51	NEL	TAL PHX
Total/NA	Analysis	300.0		200	165329	12/22/18 09:10	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 13:20	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		4	165722	12/29/18 04:03	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165722	12/29/18 04:09	SRA	TAL PHX
Total/NA	Analysis	SM 2320B		1	164955	12/19/18 15:40	DGS	TAL PHX
Total/NA	Analysis	SM 2540C		1	164875		YET	TAL PHX
					(Start)	12/19/18 11:51		
					(End)	12/20/18 09:05		
Total/NA	Analysis	SM 4500 H+ B		1	165356	12/26/18 14:18	MRR	TAL PHX

Client Sample ID: FC-CCR-MW56-121618

Lab Sample ID: 550-115113-8

Date Collected: 12/16/18 14:17

Matrix: Water

Date Received: 12/18/18 12:33

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/22/18 09:28	NEL	TAL PHX
Total/NA	Analysis	300.0		200	165329	12/22/18 09:47	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 13:26	SRA	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115113-1
SDG: Cholla

Client Sample ID: FC-CCR-MW56-121618

Lab Sample ID: 550-115113-8

Date Collected: 12/16/18 14:17
Matrix: Water
Date Received: 12/18/18 12:33

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		4	165722	12/29/18 04:15	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165722	12/29/18 04:20	SRA	TAL PHX
Total/NA	Analysis	SM 2320B		1	164955	12/19/18 16:24	DGS	TAL PHX
Total/NA	Analysis	SM 2540C		1	164875		YET	TAL PHX
					(Start)	12/19/18 11:51		
					(End)	12/20/18 09:05		
Total/NA	Analysis	SM 4500 H+ B		1	165356	12/26/18 14:18	MRR	TAL PHX

Client Sample ID: FC-CCR-MW15-121618

Lab Sample ID: 550-115113-9

Date Collected: 12/16/18 09:51
Matrix: Water
Date Received: 12/18/18 12:33

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/22/18 10:05	NEL	TAL PHX
Total/NA	Analysis	300.0		200	165329	12/22/18 10:23	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 13:32	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165722	12/29/18 04:26	SRA	TAL PHX
Total/NA	Analysis	SM 2320B		1	164955	12/19/18 16:36	DGS	TAL PHX
Total/NA	Analysis	SM 2540C		1	164875		YET	TAL PHX
					(Start)	12/19/18 11:51		
					(End)	12/20/18 09:05		
Total/NA	Analysis	SM 4500 H+ B		1	165356	12/26/18 14:18	MRR	TAL PHX

Laboratory References:

TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

Accreditation/Certification Summary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115113-1
SDG: Cholla

Laboratory: TestAmerica Phoenix

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Arizona	State Program	9	AZ0728	06-09-19

Method Summary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115113-1
SDG: Cholla

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL PHX
200.7 Rev 4.4	Metals (ICP)	40CFR136A	TAL PHX
SM 2320B	Alkalinity	SM	TAL PHX
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PHX
SM 4500 H+ B	pH	SM	TAL PHX
200.7	Preparation, Total Metals	EPA	TAL PHX

Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.
EPA = US Environmental Protection Agency
MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
SM = "Standard Methods For The Examination Of Water And Wastewater"

Laboratory References:

TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

TestAmerica Phoenix
4625 E Cotton Center Blvd
Suite 189
Phoenix, AZ 85040
phone 602.437.3340 fax 602.454.9303

Chain of Custody Record

115113

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

1/21/2019

Regulatory Program: CCR

TestAmerica Laboratories, Inc.

Client Contact	Doug Lavarnway	Doug Lavarnway	12/17/2018	COC No:
APS Cholla	928-587-0319	Lab Contact:	Carrier:	1 of 1 COCs
4801 Cholla Lake Road	Analysis Turnaround Time			Sampler:
Joseph City, Az 86032				For Lab Use Only:
(928) 587-0319 Phone	TAT if different from Below _____			Walk-in Client:
(xxx) xxx-xxxx FAX				Lab Sampling:
Project Name: CCR				Job / SDG No.:
Site: Cholla				
P O #				

	Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	EPA 200.7 (Li, Mg, SiO2)	200.8 (Sb, As, Ba, Cd, Cr, Co, Pb, Mo, Se, Tl)		EPA 300.0 (F)	Sample Specific Notes:
-1	FC-CCR-MW75-121518	12/15/2018	1627	G	W	2	N	x	x	x		x	
-2	FC-CCR-MW38R-121518	12/15/2018	1414	G	W	2	N		x	x		x	
-3	FC-CCR-MW57-121518	12/15/2018	1315	G	W	2	N		x	x		x	
-4	FC-CCR-MW61-121518	12/15/2018	1539	G	W	2	N		x	x		x	
-5	FC-CCR-MW17R-121718	12/17/2018	747	G	W	2	N		x	x		x	
-6	FC-CCR-DMX4-121618	12/16/2018	1241	G	W	2	N		x	x		x	
-7	FC-CCR-FD02-121618	12/16/2018	1241	G	W	2	N		x	x		x	
-8	FC-CCR-MW56-121618	12/16/2018	1417	G	W	2	N		x	x		x	
-9	FC-CCR-MW15-121618	12/16/2018	951	G	W	2	N		x	x		x	

550-115113 Chain of Custody

Page 32 of 34

Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

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

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments: Method 200.8 with collision cell.

2.2 | 3.7=

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: _____ Corr'd: 2.2 | Therm ID No.: _____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Doug Lavarnway	APS	12/18/1233			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company: TA-PHX	Date/Time: 12/18/18 12:33

2-2-C

COO

TestAmerica Phoenix
4625 E Cotton Center Blvd
Suite 189
Phoenix, AZ 85040
phone 602.437.3340 fax 602.454.9303

Chain of Custody Record

115113

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

1/21/2019

Regulatory Program: CCR

TestAmerica Laboratories, Inc.

Client Contact	Doug Lavarnway	Doug Lavarnway	12/17/2018	COC No:
APS Cholla	928-587-0319	Lab Contact:	Carrier:	__1__ of __1__ COCs
4801 Cholla Lake Road	Analysis Turnaround Time			Sampler:
Joseph City, Az 86032				For Lab Use Only:
(928) 587-0319 Phone	TAT if different from Below _____			Walk-in Client:
(xxx) xxx-xxxx FAX				Lab Sampling:
Project Name: CCR				
Site: Cholla				Job / SDG No.:
P O #				

	Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	EPA 200.7 Rev 4.4 (B, Ca, Na, K, Mg)	EPA 300.0 (Cl, F, SO4)	SM 2540C (TDS)	SM 4500-HB (pH)	SM 2320B (HCO3)	Alkalinity	Carbonate as CaCO3	Bicarbonate as CaCO3	Sample Specific Notes:
-1	FC-CCR-MW75-121518	12/15/2018	1627	G	W	2	N	x	x	x	x	x	x	x	x	x	
-2	FC-CCR-MW38R-121518	12/15/2018	1414	G	W	2	N		x	x	x	x	x	x	x	x	
-3	FC-CCR-MW57-121518	12/15/2018	1315	G	W	2	N		x	x	x	x	x	x	x	x	
-4	FC-CCR-MW61-121518	12/15/2018	1539	G	W	2	N		x	x	x	x	x	x	x	x	
-5	FC-CCR-MW17R-121718	12/17/2018	747	G	W	2	N		x	x	x	x	x	x	x	x	
-6	FC-CCR-DMX4-121618	12/16/2018	1241	G	W	2	N		x	x	x	x	x	x	x	x	
-7	FC-CCR-FD02-121618	12/16/2018	1241	G	W	2	N		x	x	x	x	x	x	x	x	
-8	FC-CCR-MW56-121618	12/16/2018	1417	G	W	2	N		x	x	x	x	x	x	x	x	
-9	FC-CCR-MW15-121618	12/16/2018	951	G	W	2	N		x	x	x	x	x	x	x	x	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

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

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: _____ Corr'd: 2.2 | 3.7 | Therm ID No.: _____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Doug Lavarnway	APS	12/18 0933			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
				IA-PHX	12/18/18 1213

Login Sample Receipt Checklist

Client: Arizona Public Service Company

Job Number: 550-115113-1
SDG Number: Cholla

Login Number: 115113
List Number: 1
Creator: Maycock, Lisa

List Source: TestAmerica Phoenix

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

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ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Phoenix
4625 East Cotton Ctr Blvd
Suite 189
Phoenix, AZ 85040
Tel: (602)437-3340

TestAmerica Job ID: 550-115113-2
TestAmerica Sample Delivery Group: Cholla
Client Project/Site: CCR

For:
Arizona Public Service Company
4801 Cholla Lake Rd
Joseph City, Arizona 86032

Attn: Doug Lavarnway

Authorized for release by:
1/21/2019 1:17:31 PM

Ken Baker, Project Manager II
(602)659-7624
ken.baker@testamericainc.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.testamericainc.com

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

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

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Definitions/Glossary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115113-2
SDG: Cholla

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
D1	Sample required dilution due to matrix.
D5	Minimum Reporting Limit (MRL) adjusted due to sample dilution; analyte was non-detect in the sample.

Metals

Qualifier	Qualifier Description
D1	Sample required dilution due to matrix.
M1	Matrix spike recovery was high, the associated blank spike recovery was acceptable.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated blank spike was acceptable.
D2	Sample required dilution due to high concentration of analyte.

Glossary

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

Job ID: 550-115113-2

Laboratory: TestAmerica Phoenix

Narrative

Job Narrative
550-115113-2

Comments
No additional comments.

Receipt
The samples were received on 12/18/2018 12:33 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.2º C and 3.7º C.

HPLC/IC
Method(s) 300.0: The following samples were diluted for Fluoride by method EPA 300.0 due to the nature of the sample matrix: FC-CCR-MW38R-121518 (550-115113-2), FC-CCR-MW57-121518 (550-115113-3), FC-CCR-MW17R-121718 (550-115113-5), FC-CCR-DMX4-121618 (550-115113-6), FC-CCR-FD02-121618 (550-115113-7), FC-CCR-MW56-121618 (550-115113-8) and FC-CCR-MW15-121618 (550-115113-9). The samples contained high concentrations of Chloride and Sulfate which exceeded the instrument's maximum column capacity. Fluoride was not detected in the diluted samples. As such, elevated reporting limits (RLs) have been provided and these data have been qualified with D1 and D5 flags.

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

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

Sample Summary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115113-2
SDG: Cholla

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
550-115113-1	FC-CCR-MW75-121518	Water	12/15/18 16:27	12/18/18 12:33
550-115113-2	FC-CCR-MW38R-121518	Water	12/15/18 14:14	12/18/18 12:33
550-115113-3	FC-CCR-MW57-121518	Water	12/15/18 13:15	12/18/18 12:33
550-115113-4	FC-CCR-MW61-121518	Water	12/15/18 15:39	12/18/18 12:33
550-115113-5	FC-CCR-MW17R-121718	Water	12/17/18 07:47	12/18/18 12:33
550-115113-6	FC-CCR-DMX4-121618	Water	12/16/18 12:41	12/18/18 12:33
550-115113-7	FC-CCR-FD02-121618	Water	12/16/18 12:41	12/18/18 12:33
550-115113-8	FC-CCR-MW56-121618	Water	12/16/18 14:17	12/18/18 12:33
550-115113-9	FC-CCR-MW15-121618	Water	12/16/18 09:51	12/18/18 12:33

Detection Summary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115113-2
SDG: Cholla

Client Sample ID: FC-CCR-MW75-121518 — Lab Sample ID: 550-115113-1

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	1.2	D1	0.80		mg/L	2		300.0	Total/NA
Lithium	0.41		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	220		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
SiO2, Silica	6.9		0.21		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.022	D1	0.010		mg/L	20		200.8 LL	Total/NA
Cobalt	0.046	D1	0.010		mg/L	20		200.8 LL	Total/NA
Molybdenum	0.17	D1	0.010		mg/L	20		200.8 LL	Total/NA
Selenium	0.026	D1 M1	0.010		mg/L	20		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW38R-121518 — Lab Sample ID: 550-115113-2

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	0.80		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	680		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
SiO2, Silica	17		0.21		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.026	D1	0.010		mg/L	20		200.8 LL	Total/NA
Cobalt	0.093	D1	0.010		mg/L	20		200.8 LL	Total/NA
Selenium	0.044	D1	0.010		mg/L	20		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW57-121518 — Lab Sample ID: 550-115113-3

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	0.80		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	610		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
SiO2, Silica	17		0.21		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.023	D1	0.010		mg/L	20		200.8 LL	Total/NA
Selenium	0.022	D1	0.010		mg/L	20		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW61-121518 — Lab Sample ID: 550-115113-4

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	1.3	D1	0.80		mg/L	2		300.0	Total/NA
Lithium	0.37		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	120		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
SiO2, Silica	7.7		0.21		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.019	D1	0.010		mg/L	20		200.8 LL	Total/NA
Cobalt	0.022	D1	0.010		mg/L	20		200.8 LL	Total/NA
Molybdenum	0.10	D1	0.010		mg/L	20		200.8 LL	Total/NA
Selenium	0.023	D1	0.010		mg/L	20		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW17R-121718 — Lab Sample ID: 550-115113-5

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	0.41		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	260		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
SiO2, Silica	14		0.21		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.027	D1	0.010		mg/L	20		200.8 LL	Total/NA
Cobalt	0.091	D1	0.010		mg/L	20		200.8 LL	Total/NA
Selenium	0.019	D1	0.010		mg/L	20		200.8 LL	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115113-2
SDG: Cholla

Client Sample ID: FC-CCR-DMX4-121618 — Lab Sample ID: 550-115113-6

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	0.67		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	730		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
SiO2, Silica	11		0.21		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.016	D1	0.010		mg/L	20		200.8 LL	Total/NA
Molybdenum	0.013	D1	0.010		mg/L	20		200.8 LL	Total/NA
Selenium	0.027	D1	0.010		mg/L	20		200.8 LL	Total/NA

Client Sample ID: FC-CCR-FD02-121618 — Lab Sample ID: 550-115113-7

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	0.66		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	720		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
SiO2, Silica	11		0.21		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.015	D1	0.010		mg/L	20		200.8 LL	Total/NA
Molybdenum	0.013	D1	0.010		mg/L	20		200.8 LL	Total/NA
Selenium	0.026	D1	0.010		mg/L	20		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW56-121618 — Lab Sample ID: 550-115113-8

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	1.1		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	1300	D2	8.0		mg/L	4		200.7 Rev 4.4	Total/NA
SiO2, Silica	20		0.21		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.029	D1	0.010		mg/L	20		200.8 LL	Total/NA
Selenium	0.21	D1	0.010		mg/L	20		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW15-121618 — Lab Sample ID: 550-115113-9

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	0.91		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	550		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
SiO2, Silica	14		0.21		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.022	D1	0.010		mg/L	20		200.8 LL	Total/NA
Selenium	0.016	D1	0.010		mg/L	20		200.8 LL	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-MW75-121518

Lab Sample ID: 550-115113-1
Date Collected: 12/15/18 16:27
Matrix: Water
Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**1.2**	**D1**	0.80		mg/L			12/22/18 03:57	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Lithium	**0.41**		0.20		mg/L		12/20/18 10:34	12/27/18 11:56	1
Magnesium	**220**		2.0		mg/L		12/20/18 10:34	12/27/18 11:56	1
SiO2, Silica	**6.9**		0.21		mg/L		12/20/18 10:34	12/29/18 02:09	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	D1	0.020		mg/L		12/19/18 10:53	01/16/19 01:02	20
Arsenic	ND	D1	0.010		mg/L		01/17/19 05:40	01/17/19 19:18	20
Barium	**0.022**	**D1**	0.010		mg/L		01/17/19 05:40	01/17/19 19:18	20
Cadmium	ND	D1	0.0020		mg/L		12/19/18 10:53	01/16/19 01:02	20
Chromium	ND	D1	0.020		mg/L		12/19/18 10:53	01/16/19 01:02	20
Cobalt	**0.046**	**D1**	0.010		mg/L		12/19/18 10:53	01/16/19 01:02	20
Lead	ND	D1	0.010		mg/L		12/19/18 10:53	01/16/19 01:02	20
Molybdenum	**0.17**	**D1**	0.010		mg/L		12/19/18 10:53	01/16/19 01:02	20
Selenium	**0.026**	**D1 M1**	0.010		mg/L		12/19/18 10:53	01/16/19 01:02	20
Thallium	ND	D1	0.0020		mg/L		12/19/18 10:53	01/16/19 01:02	20

Client Sample ID: FC-CCR-MW38R-121518

Lab Sample ID: 550-115113-2
Date Collected: 12/15/18 14:14
Matrix: Water
Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			12/22/18 01:30	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Lithium	**0.80**		0.20		mg/L		12/20/18 10:34	12/27/18 12:45	1
Magnesium	**680**		2.0		mg/L		12/20/18 10:34	12/27/18 12:45	1
SiO2, Silica	**17**		0.21		mg/L		12/20/18 10:34	12/29/18 03:22	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	D1	0.020		mg/L		12/19/18 10:53	01/16/19 01:08	20
Arsenic	ND	D1	0.010		mg/L		01/17/19 05:40	01/17/19 19:25	20
Barium	**0.026**	**D1**	0.010		mg/L		01/17/19 05:40	01/17/19 19:25	20
Cadmium	ND	D1	0.0020		mg/L		12/19/18 10:53	01/16/19 01:08	20
Chromium	ND	D1	0.020		mg/L		12/19/18 10:53	01/16/19 01:08	20
Cobalt	**0.093**	**D1**	0.010		mg/L		12/19/18 10:53	01/16/19 01:08	20
Lead	ND	D1	0.010		mg/L		12/19/18 10:53	01/16/19 01:08	20
Molybdenum	ND	D1	0.010		mg/L		12/19/18 10:53	01/16/19 01:08	20
Selenium	**0.044**	**D1**	0.010		mg/L		12/19/18 10:53	01/16/19 01:08	20
Thallium	ND	D1	0.0020		mg/L		12/19/18 10:53	01/16/19 01:08	20

Client Sample ID: FC-CCR-MW57-121518

Lab Sample ID: 550-115113-3

Date Collected: 12/15/18 13:15

Matrix: Water

Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			12/22/18 02:06	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Lithium	**0.80**		0.20		mg/L		12/20/18 10:34	12/27/18 12:51	1
Magnesium	**610**		2.0		mg/L		12/20/18 10:34	12/27/18 12:51	1
SiO2, Silica	**17**		0.21		mg/L		12/20/18 10:34	12/29/18 03:28	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	D1	0.020		mg/L		12/19/18 10:53	01/16/19 01:11	20
Arsenic	ND	D1	0.010		mg/L		01/17/19 05:40	01/17/19 19:27	20
Barium	**0.023**	**D1**	0.010		mg/L		01/17/19 05:40	01/17/19 19:27	20
Cadmium	ND	D1	0.0020		mg/L		12/19/18 10:53	01/16/19 01:11	20
Chromium	ND	D1	0.020		mg/L		12/19/18 10:53	01/16/19 01:11	20
Cobalt	ND	D1	0.010		mg/L		12/19/18 10:53	01/16/19 01:11	20
Lead	ND	D1	0.010		mg/L		12/19/18 10:53	01/16/19 01:11	20
Molybdenum	ND	D1	0.010		mg/L		12/19/18 10:53	01/16/19 01:11	20
Selenium	**0.022**	**D1**	0.010		mg/L		12/19/18 10:53	01/16/19 01:11	20
Thallium	ND	D1	0.0020		mg/L		12/19/18 10:53	01/16/19 01:11	20

Client Sample ID: FC-CCR-MW61-121518

Lab Sample ID: 550-115113-4

Date Collected: 12/15/18 15:39

Matrix: Water

Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**1.3**	**D1**	0.80		mg/L			12/22/18 02:43	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Lithium	**0.37**		0.20		mg/L		12/20/18 10:34	12/27/18 12:57	1
Magnesium	**120**		2.0		mg/L		12/20/18 10:34	12/27/18 12:57	1
SiO2, Silica	**7.7**		0.21		mg/L		12/20/18 10:34	12/29/18 03:39	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	D1	0.020		mg/L		12/19/18 10:53	01/16/19 01:13	20
Arsenic	ND	D1	0.010		mg/L		01/17/19 05:40	01/17/19 19:30	20
Barium	**0.019**	**D1**	0.010		mg/L		01/17/19 05:40	01/17/19 19:30	20
Cadmium	ND	D1	0.0020		mg/L		12/19/18 10:53	01/16/19 01:13	20
Chromium	ND	D1	0.020		mg/L		12/19/18 10:53	01/16/19 01:13	20
Cobalt	**0.022**	**D1**	0.010		mg/L		12/19/18 10:53	01/16/19 01:13	20
Lead	ND	D1	0.010		mg/L		12/19/18 10:53	01/16/19 01:13	20
Molybdenum	**0.10**	**D1**	0.010		mg/L		12/19/18 10:53	01/16/19 01:13	20
Selenium	**0.023**	**D1**	0.010		mg/L		12/19/18 10:53	01/16/19 01:13	20
Thallium	ND	D1	0.0020		mg/L		12/19/18 10:53	01/16/19 01:13	20

Client Sample ID: FC-CCR-MW17R-121718

Lab Sample ID: 550-115113-5
Date Collected: 12/17/18 07:47
Matrix: Water
Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			12/22/18 07:38	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Lithium	**0.41**		0.20		mg/L		12/20/18 10:34	12/27/18 13:03	1
Magnesium	**260**		2.0		mg/L		12/20/18 10:34	12/27/18 13:03	1
SiO2, Silica	**14**		0.21		mg/L		12/20/18 10:34	12/29/18 03:45	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	D1	0.020		mg/L		12/19/18 10:53	01/16/19 01:15	20
Arsenic	ND	D1	0.010		mg/L		01/17/19 05:40	01/17/19 19:32	20
Barium	**0.027**	**D1**	0.010		mg/L		01/17/19 05:40	01/17/19 19:32	20
Cadmium	ND	D1	0.0020		mg/L		12/19/18 10:53	01/16/19 01:15	20
Chromium	ND	D1	0.020		mg/L		12/19/18 10:53	01/16/19 01:15	20
Cobalt	**0.091**	**D1**	0.010		mg/L		12/19/18 10:53	01/16/19 01:15	20
Lead	ND	D1	0.010		mg/L		12/19/18 10:53	01/16/19 01:15	20
Molybdenum	ND	D1	0.010		mg/L		12/19/18 10:53	01/16/19 01:15	20
Selenium	**0.019**	**D1**	0.010		mg/L		12/19/18 10:53	01/16/19 01:15	20
Thallium	ND	D1	0.0020		mg/L		12/19/18 10:53	01/16/19 01:15	20

Client Sample ID: FC-CCR-DMX4-121618

Lab Sample ID: 550-115113-6
Date Collected: 12/16/18 12:41
Matrix: Water
Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			12/22/18 08:15	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Lithium	**0.67**		0.20		mg/L		12/20/18 10:34	12/27/18 13:09	1
Magnesium	**730**		2.0		mg/L		12/20/18 10:34	12/27/18 13:09	1
SiO2, Silica	**11**		0.21		mg/L		12/20/18 10:34	12/29/18 03:57	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	D1	0.020		mg/L		12/19/18 10:53	01/16/19 01:18	20
Arsenic	ND	D1	0.010		mg/L		01/17/19 05:40	01/17/19 19:34	20
Barium	**0.016**	**D1**	0.010		mg/L		01/17/19 05:40	01/17/19 19:34	20
Cadmium	ND	D1	0.0020		mg/L		12/19/18 10:53	01/16/19 01:18	20
Chromium	ND	D1	0.020		mg/L		12/19/18 10:53	01/16/19 01:18	20
Cobalt	ND	D1	0.010		mg/L		12/19/18 10:53	01/16/19 01:18	20
Lead	ND	D1	0.010		mg/L		12/19/18 10:53	01/16/19 01:18	20
Molybdenum	**0.013**	**D1**	0.010		mg/L		12/19/18 10:53	01/16/19 01:18	20
Selenium	**0.027**	**D1**	0.010		mg/L		12/19/18 10:53	01/16/19 01:18	20
Thallium	ND	D1	0.0020		mg/L		12/19/18 10:53	01/16/19 01:18	20

Client Sample ID: FC-CCR-FD02-121618

Lab Sample ID: 550-115113-7

Date Collected: 12/16/18 12:41
Matrix: Water
Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			12/22/18 08:51	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Lithium	**0.66**		0.20		mg/L		12/20/18 10:34	12/27/18 13:20	1
Magnesium	**720**		2.0		mg/L		12/20/18 10:34	12/27/18 13:20	1
SiO2, Silica	**11**		0.21		mg/L		12/20/18 10:34	12/29/18 04:09	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	D1	0.020		mg/L		12/19/18 10:53	01/16/19 01:20	20
Arsenic	ND	D1	0.010		mg/L		01/17/19 05:40	01/17/19 19:37	20
Barium	**0.015**	**D1**	0.010		mg/L		01/17/19 05:40	01/17/19 19:37	20
Cadmium	ND	D1	0.0020		mg/L		12/19/18 10:53	01/16/19 01:20	20
Chromium	ND	D1	0.020		mg/L		12/19/18 10:53	01/16/19 01:20	20
Cobalt	ND	D1	0.010		mg/L		12/19/18 10:53	01/16/19 01:20	20
Lead	ND	D1	0.010		mg/L		12/19/18 10:53	01/16/19 01:20	20
Molybdenum	**0.013**	**D1**	0.010		mg/L		12/19/18 10:53	01/16/19 01:20	20
Selenium	**0.026**	**D1**	0.010		mg/L		12/19/18 10:53	01/16/19 01:20	20
Thallium	ND	D1	0.0020		mg/L		12/19/18 10:53	01/16/19 01:20	20

Client Sample ID: FC-CCR-MW56-121618

Lab Sample ID: 550-115113-8

Date Collected: 12/16/18 14:17
Matrix: Water
Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			12/22/18 09:28	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Lithium	**1.1**		0.20		mg/L		12/20/18 10:34	12/27/18 13:26	1
Magnesium	**1300**	**D2**	8.0		mg/L		12/20/18 10:34	12/29/18 04:15	4
SiO2, Silica	**20**		0.21		mg/L		12/20/18 10:34	12/29/18 04:20	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	D1	0.020		mg/L		12/19/18 10:53	01/16/19 01:22	20
Arsenic	ND	D1	0.010		mg/L		01/17/19 05:40	01/17/19 19:39	20
Barium	**0.029**	**D1**	0.010		mg/L		01/17/19 05:40	01/17/19 19:39	20
Cadmium	ND	D1	0.0020		mg/L		12/19/18 10:53	01/16/19 01:22	20
Chromium	ND	D1	0.020		mg/L		12/19/18 10:53	01/16/19 01:22	20
Cobalt	ND	D1	0.010		mg/L		12/19/18 10:53	01/16/19 01:22	20
Lead	ND	D1	0.010		mg/L		12/19/18 10:53	01/16/19 01:22	20
Molybdenum	ND	D1	0.010		mg/L		12/19/18 10:53	01/16/19 01:22	20
Selenium	**0.21**	**D1**	0.010		mg/L		12/19/18 10:53	01/16/19 01:22	20
Thallium	ND	D1	0.0020		mg/L		12/19/18 10:53	01/16/19 01:22	20

Client Sample Results

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115113-2
SDG: Cholla

Client Sample ID: FC-CCR-MW15-121618
Date Collected: 12/16/18 09:51
Date Received: 12/18/18 12:33

Lab Sample ID: 550-115113-9
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			12/22/18 10:05	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Lithium	**0.91**		0.20		mg/L		12/20/18 10:34	12/27/18 13:32	1
Magnesium	**550**		2.0		mg/L		12/20/18 10:34	12/27/18 13:32	1
SiO2, Silica	**14**		0.21		mg/L		12/20/18 10:34	12/29/18 04:26	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	D1	0.020		mg/L		12/19/18 10:53	01/16/19 01:25	20
Arsenic	ND	D1	0.010		mg/L		01/17/19 05:40	01/17/19 19:41	20
Barium	**0.022**	**D1**	0.010		mg/L		01/17/19 05:40	01/17/19 19:41	20
Cadmium	ND	D1	0.0020		mg/L		12/19/18 10:53	01/16/19 01:25	20
Chromium	ND	D1	0.020		mg/L		12/19/18 10:53	01/16/19 01:25	20
Cobalt	ND	D1	0.010		mg/L		12/19/18 10:53	01/16/19 01:25	20
Lead	ND	D1	0.010		mg/L		12/19/18 10:53	01/16/19 01:25	20
Molybdenum	ND	D1	0.010		mg/L		12/19/18 10:53	01/16/19 01:25	20
Selenium	**0.016**	**D1**	0.010		mg/L		12/19/18 10:53	01/16/19 01:25	20
Thallium	ND	D1	0.0020		mg/L		12/19/18 10:53	01/16/19 01:25	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: 550-115113-1 MS
Matrix: Water
Analysis Batch: 165329

Client Sample ID: FC-CCR-MW75-121518
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	1.2	D1	8.00	9.53	D1	mg/L		103	80 - 120

Lab Sample ID: 550-115113-1 MSD
Matrix: Water
Analysis Batch: 165329

Client Sample ID: FC-CCR-MW75-121518
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	1.2	D1	8.00	9.49	D1	mg/L		103	80 - 120	0	20

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 550-164986/1-A
Matrix: Water
Analysis Batch: 165722

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 164986

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
SiO2, Silica	ND		0.21		mg/L		12/20/18 10:34	12/29/18 01:49	1

Lab Sample ID: LCS 550-164986/2-A
Matrix: Water
Analysis Batch: 165722

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 164986

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
SiO2, Silica	10.7	10.6		mg/L		99	85 - 115

Lab Sample ID: LCSD 550-164986/3-A
Matrix: Water
Analysis Batch: 165722

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 164986

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
SiO2, Silica	10.7	10.5		mg/L		98	85 - 115	1	20

Lab Sample ID: 550-115113-1 MS
Matrix: Water
Analysis Batch: 165571

Client Sample ID: FC-CCR-MW75-121518
Prep Type: Total/NA
Prep Batch: 164986

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Lithium	0.410		1.00	1.45		mg/L		104	70 - 130
Magnesium	222		21.0	243	M3	mg/L		101	70 - 130

Lab Sample ID: 550-115113-1 MS
Matrix: Water
Analysis Batch: 165722

Client Sample ID: FC-CCR-MW75-121518
Prep Type: Total/NA
Prep Batch: 164986

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
SiO2, Silica	6.93		10.7	17.9		mg/L		102	70 - 130

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: 550-115113-1 MSD
Matrix: Water
Analysis Batch: 165571

Client Sample ID: FC-CCR-MW75-121518
Prep Type: Total/NA
Prep Batch: 164986

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Beryllium	-0.0000443		1.00	0.981		mg/L		98	70 - 130	4	20
Lithium	0.410		1.00	1.37		mg/L		96	70 - 130	6	20

Method: 200.8 LL - Metals (ICP/MS)

Lab Sample ID: MB 550-164866/1-A
Matrix: Water
Analysis Batch: 166805

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 164866

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		12/19/18 10:53	01/16/19 00:55	1
Barium	ND		0.00050		mg/L		12/19/18 10:53	01/16/19 00:55	1
Cadmium	ND		0.00010		mg/L		12/19/18 10:53	01/16/19 00:55	1
Chromium	ND		0.0010		mg/L		12/19/18 10:53	01/16/19 00:55	1
Cobalt	ND		0.00050		mg/L		12/19/18 10:53	01/16/19 00:55	1
Lead	ND		0.00050		mg/L		12/19/18 10:53	01/16/19 00:55	1
Molybdenum	ND		0.00050		mg/L		12/19/18 10:53	01/16/19 00:55	1
Selenium	ND		0.00050		mg/L		12/19/18 10:53	01/16/19 00:55	1
Thallium	ND		0.00010		mg/L		12/19/18 10:53	01/16/19 00:55	1

Lab Sample ID: LCS 550-164866/2-A
Matrix: Water
Analysis Batch: 166805

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 164866

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Antimony			0.100	0.105		mg/L		105	85 - 115		
Cadmium			0.100	0.105		mg/L		105	85 - 115		
Chromium			0.100	0.105		mg/L		105	85 - 115		
Cobalt			0.100	0.104		mg/L		104	85 - 115		
Lead			0.100	0.101		mg/L		101	85 - 115		
Molybdenum			0.100	0.105		mg/L		105	85 - 115		
Selenium			0.100	0.105		mg/L		105	85 - 115		
Thallium			0.100	0.105		mg/L		105	85 - 115		

Lab Sample ID: LCSD 550-164866/3-A
Matrix: Water
Analysis Batch: 166805

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 164866

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony			0.100	0.104		mg/L		104	85 - 115	1	20
Cadmium			0.100	0.104		mg/L		104	85 - 115	1	20
Chromium			0.100	0.104		mg/L		104	85 - 115	1	20
Cobalt			0.100	0.103		mg/L		103	85 - 115	2	20
Lead			0.100	0.102		mg/L		102	85 - 115	0	20
Molybdenum			0.100	0.104		mg/L		104	85 - 115	1	20
Selenium			0.100	0.104		mg/L		104	85 - 115	2	20
Thallium			0.100	0.106		mg/L		106	85 - 115	1	20

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Lab Sample ID: 550-115113-1 MS — **Client Sample ID: FC-CCR-MW75-121518**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 166805 — **Prep Batch: 164866**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	ND	D1	0.100	0.0991	D1	mg/L		99	70 - 130
Cadmium	ND	D1	0.100	0.0988	D1	mg/L		98	70 - 130
Chromium	ND	D1	0.100	0.0998	D1	mg/L		100	70 - 130
Cobalt	0.046	D1	0.100	0.141	D1	mg/L		94	70 - 130
Lead	ND	D1	0.100	0.0943	D1	mg/L		94	70 - 130
Molybdenum	0.17	D1	0.100	0.270	D1	mg/L		97	70 - 130
Selenium	0.026	M1 D1	0.100	0.197	D1 M1	mg/L		171	70 - 130
Thallium	ND	D1	0.100	0.0952	D1	mg/L		95	70 - 130

Lab Sample ID: 550-115113-1 MSD — **Client Sample ID: FC-CCR-MW75-121518**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 166805 — **Prep Batch: 164866**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	ND	D1	0.100	0.100	D1	mg/L		100	70 - 130	1	20
Cadmium	ND	D1	0.100	0.103	D1	mg/L		102	70 - 130	4	20
Chromium	ND	D1	0.100	0.100	D1	mg/L		100	70 - 130	1	20
Cobalt	0.046	D1	0.100	0.142	D1	mg/L		95	70 - 130	1	20
Lead	ND	D1	0.100	0.0957	D1	mg/L		96	70 - 130	2	20
Molybdenum	0.17	D1	0.100	0.271	D1	mg/L		98	70 - 130	0	20
Selenium	0.026	M1 D1	0.100	0.191	D1 M1	mg/L		165	70 - 130	3	20
Thallium	ND	D1	0.100	0.0968	D1	mg/L		97	70 - 130	2	20

Lab Sample ID: MB 550-166919/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 167014 — **Prep Batch: 166919**

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.00050		mg/L		01/17/19 05:40	01/17/19 19:12	1
Barium	ND		0.00050		mg/L		01/17/19 05:40	01/17/19 19:12	1
Lead	ND		0.00050		mg/L		01/17/19 05:40	01/17/19 19:12	1

Lab Sample ID: LCS 550-166919/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 167014 — **Prep Batch: 166919**

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic			0.100	0.100		mg/L		100	85 - 115
Barium			0.100	0.104		mg/L		104	85 - 115
Lead			0.100	0.0981		mg/L		98	85 - 115

Lab Sample ID: LCSD 550-166919/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 167014 — **Prep Batch: 166919**

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic			0.100	0.0988		mg/L		99	85 - 115	1	20
Barium			0.100	0.106		mg/L		106	85 - 115	2	20
Lead			0.100	0.0984		mg/L		98	85 - 115	0	20

QC Sample Results

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115113-2
SDG: Cholla

Lab Sample ID: 550-115113-1 MS
Matrix: Water
Analysis Batch: 167014

Client Sample ID: FC-CCR-MW75-121518
Prep Type: Total/NA
Prep Batch: 166919

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic	ND	D1	0.100	0.114		mg/L		114	70 - 130		
Barium	0.022	D1	0.100	0.137		mg/L		115	70 - 130		

Lab Sample ID: 550-115113-1 MSD
Matrix: Water
Analysis Batch: 167014

Client Sample ID: FC-CCR-MW75-121518
Prep Type: Total/NA
Prep Batch: 166919

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	ND	D1	0.100	0.111		mg/L		111	70 - 130	2	20
Barium	0.022	D1	0.100	0.144		mg/L		122	70 - 130	5	20

QC Association Summary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115113-2
SDG: Cholla

HPLC/IC

Analysis Batch: 165329

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115113-1	FC-CCR-MW75-121518	Total/NA	Water	300.0	
550-115113-2	FC-CCR-MW38R-121518	Total/NA	Water	300.0	
550-115113-3	FC-CCR-MW57-121518	Total/NA	Water	300.0	
550-115113-4	FC-CCR-MW61-121518	Total/NA	Water	300.0	
550-115113-5	FC-CCR-MW17R-121718	Total/NA	Water	300.0	
550-115113-6	FC-CCR-DMX4-121618	Total/NA	Water	300.0	
550-115113-7	FC-CCR-FD02-121618	Total/NA	Water	300.0	
550-115113-8	FC-CCR-MW56-121618	Total/NA	Water	300.0	
550-115113-9	FC-CCR-MW15-121618	Total/NA	Water	300.0	
550-115113-1 MS	FC-CCR-MW75-121518	Total/NA	Water	300.0	
550-115113-1 MSD	FC-CCR-MW75-121518	Total/NA	Water	300.0	

Metals

Prep Batch: 164866

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115113-1	FC-CCR-MW75-121518	Total/NA	Water	200.8	
550-115113-2	FC-CCR-MW38R-121518	Total/NA	Water	200.8	
550-115113-3	FC-CCR-MW57-121518	Total/NA	Water	200.8	
550-115113-4	FC-CCR-MW61-121518	Total/NA	Water	200.8	
550-115113-5	FC-CCR-MW17R-121718	Total/NA	Water	200.8	
550-115113-6	FC-CCR-DMX4-121618	Total/NA	Water	200.8	
550-115113-7	FC-CCR-FD02-121618	Total/NA	Water	200.8	
550-115113-8	FC-CCR-MW56-121618	Total/NA	Water	200.8	
550-115113-9	FC-CCR-MW15-121618	Total/NA	Water	200.8	
MB 550-164866/1-A	Method Blank	Total/NA	Water	200.8	
LCS 550-164866/2-A	Lab Control Sample	Total/NA	Water	200.8	
LCSD 550-164866/3-A	Lab Control Sample Dup	Total/NA	Water	200.8	
550-115113-1 MS	FC-CCR-MW75-121518	Total/NA	Water	200.8	
550-115113-1 MSD	FC-CCR-MW75-121518	Total/NA	Water	200.8	

Prep Batch: 164986

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115113-1	FC-CCR-MW75-121518	Total/NA	Water	200.7	
550-115113-2	FC-CCR-MW38R-121518	Total/NA	Water	200.7	
550-115113-3	FC-CCR-MW57-121518	Total/NA	Water	200.7	
550-115113-4	FC-CCR-MW61-121518	Total/NA	Water	200.7	
550-115113-5	FC-CCR-MW17R-121718	Total/NA	Water	200.7	
550-115113-6	FC-CCR-DMX4-121618	Total/NA	Water	200.7	
550-115113-7	FC-CCR-FD02-121618	Total/NA	Water	200.7	
550-115113-8	FC-CCR-MW56-121618	Total/NA	Water	200.7	
550-115113-9	FC-CCR-MW15-121618	Total/NA	Water	200.7	
MB 550-164986/1-A	Method Blank	Total/NA	Water	200.7	
LCS 550-164986/2-A	Lab Control Sample	Total/NA	Water	200.7	
LCSD 550-164986/3-A	Lab Control Sample Dup	Total/NA	Water	200.7	
550-115113-1 MS	FC-CCR-MW75-121518	Total/NA	Water	200.7	
550-115113-1 MSD	FC-CCR-MW75-121518	Total/NA	Water	200.7	

Metals (Continued)

Analysis Batch: 165571

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115113-1	FC-CCR-MW75-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-2	FC-CCR-MW38R-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-3	FC-CCR-MW57-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-4	FC-CCR-MW61-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-5	FC-CCR-MW17R-121718	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-6	FC-CCR-DMX4-121618	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-7	FC-CCR-FD02-121618	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-8	FC-CCR-MW56-121618	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-9	FC-CCR-MW15-121618	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-1 MS	FC-CCR-MW75-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-1 MSD	FC-CCR-MW75-121518	Total/NA	Water	200.7 Rev 4.4	164986

Analysis Batch: 165722

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115113-1	FC-CCR-MW75-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-2	FC-CCR-MW38R-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-3	FC-CCR-MW57-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-4	FC-CCR-MW61-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-5	FC-CCR-MW17R-121718	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-6	FC-CCR-DMX4-121618	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-7	FC-CCR-FD02-121618	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-8	FC-CCR-MW56-121618	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-8	FC-CCR-MW56-121618	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-9	FC-CCR-MW15-121618	Total/NA	Water	200.7 Rev 4.4	164986
MB 550-164986/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	164986
LCS 550-164986/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	164986
LCSD 550-164986/3-A	Lab Control Sample Dup	Total/NA	Water	200.7 Rev 4.4	164986
550-115113-1 MS	FC-CCR-MW75-121518	Total/NA	Water	200.7 Rev 4.4	164986

Analysis Batch: 166805

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115113-1	FC-CCR-MW75-121518	Total/NA	Water	200.8 LL	164866
550-115113-2	FC-CCR-MW38R-121518	Total/NA	Water	200.8 LL	164866
550-115113-3	FC-CCR-MW57-121518	Total/NA	Water	200.8 LL	164866
550-115113-4	FC-CCR-MW61-121518	Total/NA	Water	200.8 LL	164866
550-115113-5	FC-CCR-MW17R-121718	Total/NA	Water	200.8 LL	164866
550-115113-6	FC-CCR-DMX4-121618	Total/NA	Water	200.8 LL	164866
550-115113-7	FC-CCR-FD02-121618	Total/NA	Water	200.8 LL	164866
550-115113-8	FC-CCR-MW56-121618	Total/NA	Water	200.8 LL	164866
550-115113-9	FC-CCR-MW15-121618	Total/NA	Water	200.8 LL	164866
MB 550-164866/1-A	Method Blank	Total/NA	Water	200.8 LL	164866
LCS 550-164866/2-A	Lab Control Sample	Total/NA	Water	200.8 LL	164866
LCSD 550-164866/3-A	Lab Control Sample Dup	Total/NA	Water	200.8 LL	164866
550-115113-1 MS	FC-CCR-MW75-121518	Total/NA	Water	200.8 LL	164866
550-115113-1 MSD	FC-CCR-MW75-121518	Total/NA	Water	200.8 LL	164866

Prep Batch: 166919

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115113-1	FC-CCR-MW75-121518	Total/NA	Water	200.8	
550-115113-2	FC-CCR-MW38R-121518	Total/NA	Water	200.8	
550-115113-3	FC-CCR-MW57-121518	Total/NA	Water	200.8	

Metals (Continued)

Prep Batch: 166919 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115113-4	FC-CCR-MW61-121518	Total/NA	Water	200.8	
550-115113-5	FC-CCR-MW17R-121718	Total/NA	Water	200.8	
550-115113-6	FC-CCR-DMX4-121618	Total/NA	Water	200.8	
550-115113-7	FC-CCR-FD02-121618	Total/NA	Water	200.8	
550-115113-8	FC-CCR-MW56-121618	Total/NA	Water	200.8	
550-115113-9	FC-CCR-MW15-121618	Total/NA	Water	200.8	
MB 550-166919/1-A	Method Blank	Total/NA	Water	200.8	
LCS 550-166919/2-A	Lab Control Sample	Total/NA	Water	200.8	
LCSD 550-166919/3-A	Lab Control Sample Dup	Total/NA	Water	200.8	
550-115113-1 MS	FC-CCR-MW75-121518	Total/NA	Water	200.8	
550-115113-1 MSD	FC-CCR-MW75-121518	Total/NA	Water	200.8	

Analysis Batch: 167014

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115113-1	FC-CCR-MW75-121518	Total/NA	Water	200.8 LL	166919
550-115113-2	FC-CCR-MW38R-121518	Total/NA	Water	200.8 LL	166919
550-115113-3	FC-CCR-MW57-121518	Total/NA	Water	200.8 LL	166919
550-115113-4	FC-CCR-MW61-121518	Total/NA	Water	200.8 LL	166919
550-115113-5	FC-CCR-MW17R-121718	Total/NA	Water	200.8 LL	166919
550-115113-6	FC-CCR-DMX4-121618	Total/NA	Water	200.8 LL	166919
550-115113-7	FC-CCR-FD02-121618	Total/NA	Water	200.8 LL	166919
550-115113-8	FC-CCR-MW56-121618	Total/NA	Water	200.8 LL	166919
550-115113-9	FC-CCR-MW15-121618	Total/NA	Water	200.8 LL	166919
MB 550-166919/1-A	Method Blank	Total/NA	Water	200.8 LL	166919
LCS 550-166919/2-A	Lab Control Sample	Total/NA	Water	200.8 LL	166919
LCSD 550-166919/3-A	Lab Control Sample Dup	Total/NA	Water	200.8 LL	166919
550-115113-1 MS	FC-CCR-MW75-121518	Total/NA	Water	200.8 LL	166919
550-115113-1 MSD	FC-CCR-MW75-121518	Total/NA	Water	200.8 LL	166919

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115113-2
SDG: Cholla

Client Sample ID: FC-CCR-MW75-121518

Lab Sample ID: 550-115113-1
Matrix: Water
Date Collected: 12/15/18 16:27
Date Received: 12/18/18 12:33

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/22/18 03:57	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 11:56	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165722	12/29/18 02:09	SRA	TAL PHX
Total/NA	Prep	200.8			164866	12/19/18 10:53	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		20	166805	01/16/19 01:02	ARE	TAL PHX
Total/NA	Prep	200.8			166919	01/17/19 05:40	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		20	167014	01/17/19 19:18	ARE	TAL PHX

Client Sample ID: FC-CCR-MW38R-121518

Lab Sample ID: 550-115113-2
Matrix: Water
Date Collected: 12/15/18 14:14
Date Received: 12/18/18 12:33

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/22/18 01:30	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 12:45	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165722	12/29/18 03:22	SRA	TAL PHX
Total/NA	Prep	200.8			164866	12/19/18 10:53	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		20	166805	01/16/19 01:08	ARE	TAL PHX
Total/NA	Prep	200.8			166919	01/17/19 05:40	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		20	167014	01/17/19 19:25	ARE	TAL PHX

Client Sample ID: FC-CCR-MW57-121518

Lab Sample ID: 550-115113-3
Matrix: Water
Date Collected: 12/15/18 13:15
Date Received: 12/18/18 12:33

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/22/18 02:06	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 12:51	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165722	12/29/18 03:28	SRA	TAL PHX
Total/NA	Prep	200.8			164866	12/19/18 10:53	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		20	166805	01/16/19 01:11	ARE	TAL PHX
Total/NA	Prep	200.8			166919	01/17/19 05:40	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		20	167014	01/17/19 19:27	ARE	TAL PHX

Client Sample ID: FC-CCR-MW61-121518

Lab Sample ID: 550-115113-4

Date Collected: 12/15/18 15:39

Matrix: Water

Date Received: 12/18/18 12:33

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/22/18 02:43	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 12:57	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165722	12/29/18 03:39	SRA	TAL PHX
Total/NA	Prep	200.8			164866	12/19/18 10:53	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		20	166805	01/16/19 01:13	ARE	TAL PHX
Total/NA	Prep	200.8			166919	01/17/19 05:40	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		20	167014	01/17/19 19:30	ARE	TAL PHX

Client Sample ID: FC-CCR-MW17R-121718

Lab Sample ID: 550-115113-5

Date Collected: 12/17/18 07:47

Matrix: Water

Date Received: 12/18/18 12:33

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/22/18 07:38	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 13:03	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165722	12/29/18 03:45	SRA	TAL PHX
Total/NA	Prep	200.8			164866	12/19/18 10:53	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		20	166805	01/16/19 01:15	ARE	TAL PHX
Total/NA	Prep	200.8			166919	01/17/19 05:40	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		20	167014	01/17/19 19:32	ARE	TAL PHX

Client Sample ID: FC-CCR-DMX4-121618

Lab Sample ID: 550-115113-6

Date Collected: 12/16/18 12:41

Matrix: Water

Date Received: 12/18/18 12:33

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/22/18 08:15	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 13:09	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165722	12/29/18 03:57	SRA	TAL PHX
Total/NA	Prep	200.8			164866	12/19/18 10:53	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		20	166805	01/16/19 01:18	ARE	TAL PHX
Total/NA	Prep	200.8			166919	01/17/19 05:40	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		20	167014	01/17/19 19:34	ARE	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115113-2
SDG: Cholla

Client Sample ID: FC-CCR-FD02-121618

Lab Sample ID: 550-115113-7

Date Collected: 12/16/18 12:41
Date Received: 12/18/18 12:33

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/22/18 08:51	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 13:20	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165722	12/29/18 04:09	SRA	TAL PHX
Total/NA	Prep	200.8			164866	12/19/18 10:53	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		20	166805	01/16/19 01:20	ARE	TAL PHX
Total/NA	Prep	200.8			166919	01/17/19 05:40	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		20	167014	01/17/19 19:37	ARE	TAL PHX

Client Sample ID: FC-CCR-MW56-121618

Lab Sample ID: 550-115113-8

Date Collected: 12/16/18 14:17
Date Received: 12/18/18 12:33

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/22/18 09:28	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 13:26	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		4	165722	12/29/18 04:15	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165722	12/29/18 04:20	SRA	TAL PHX
Total/NA	Prep	200.8			164866	12/19/18 10:53	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		20	166805	01/16/19 01:22	ARE	TAL PHX
Total/NA	Prep	200.8			166919	01/17/19 05:40	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		20	167014	01/17/19 19:39	ARE	TAL PHX

Client Sample ID: FC-CCR-MW15-121618

Lab Sample ID: 550-115113-9

Date Collected: 12/16/18 09:51
Date Received: 12/18/18 12:33

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/22/18 10:05	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 13:32	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165722	12/29/18 04:26	SRA	TAL PHX
Total/NA	Prep	200.8			164866	12/19/18 10:53	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		20	166805	01/16/19 01:25	ARE	TAL PHX
Total/NA	Prep	200.8			166919	01/17/19 05:40	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		20	167014	01/17/19 19:41	ARE	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115113-2
SDG: Cholla

Laboratory References:

TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

Accreditation/Certification Summary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115113-2
SDG: Cholla

Laboratory: TestAmerica Phoenix

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Arizona	State Program	9	AZ0728	06-09-19

Method Summary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115113-2
SDG: Cholla

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL PHX
200.7 Rev 4.4	Metals (ICP)	40CFR136A	TAL PHX
200.8 LL	Metals (ICP/MS)	EPA	TAL PHX
200.7	Preparation, Total Metals	EPA	TAL PHX
200.8	Preparation, Total Metals	EPA	TAL PHX

Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.
EPA = US Environmental Protection Agency
MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

Laboratory References:

TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

TestAmerica Phoenix
4625 E Cotton Center Blvd
Suite 189
Phoenix, AZ 85040
phone 602.437.3340 fax 602.454.9303

Chain of Custody Record

115113

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

1/21/2019

Regulatory Program: CCR

TestAmerica Laboratories, Inc.

Client Contact	Doug Lavarnway	Doug Lavarnway	12/17/2018	COC No:
APS Cholla	928-587-0319	Lab Contact:	Carrier:	1 of 1 COCs
4801 Cholla Lake Road	Analysis Turnaround Time			Sampler:
Joseph City, Az 86032				For Lab Use Only:
(928) 587-0319 Phone	TAT if different from Below _____			Walk-in Client:
(xxx) xxx-xxxx FAX				Lab Sampling:
Project Name: CCR				Job / SDG No.:
Site: Cholla				
P O #				

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	EPA 200.7 (Li, Mg, SiO2)	200.8 (Sb, As, Ba, Cd, Cr, Co, Pb, Mo, Se, Tl)	EPA 300.0 (F)	Sample Specific Notes:
-1 FC-CCR-MW75-121518	12/15/2018	1627	G	W	2	N	x	x	x	x	
-2 FC-CCR-MW38R-121518	12/15/2018	1414	G	W	2	N		x	x	x	
-3 FC-CCR-MW57-121518	12/15/2018	1315	G	W	2	N		x	x	x	
-4 FC-CCR-MW61-121518	12/15/2018	1539	G	W	2	N		x	x	x	
-5 FC-CCR-MW17R-121718	12/17/2018	747	G	W	2	N		x	x	x	
-6 FC-CCR-DMX4-121618	12/16/2018	1241	G	W	2	N		x	x	x	
-7 FC-CCR-FD02-121618	12/16/2018	1241	G	W	2	N		x	x	x	
-8 FC-CCR-MW56-121618	12/16/2018	1417	G	W	2	N		x	x	x	
-9 FC-CCR-MW15-121618	12/16/2018	951	G	W	2	N		x	x	x	

550-115113 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

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

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments: Method 200.8 with collision cell.

2.2 | 3.7=

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:	Cooler Temp. (°C): Obs'd: _____ Corr'd: 2.2	Therm ID No.: _____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Doug Lavarnway	APS	12/18/1233			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company: TA-PHX	Date/Time: 12/18/18 12:33

2-2-C

Form No. CA-C-WI-002, Rev. 4.2, dated 04/02/2013

TestAmerica Phoenix
4625 E Cotton Center Blvd
Suite 189
Phoenix, AZ 85040
phone 602.437.3340 fax 602.454.9303

Chain of Custody Record

115113

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

1/21/2019

Regulatory Program: CCR

TestAmerica Laboratories, Inc.

Client Contact	Doug Lavarnway	Doug Lavarnway	12/17/2018	COC No:
APS Cholla	928-587-0319	Lab Contact:	Carrier:	__1__ of __1__ COCs
4801 Cholla Lake Road	Analysis Turnaround Time			Sampler:
Joseph City, Az 86032				For Lab Use Only:
(928) 587-0319 Phone	TAT if different from Below _____			Walk-in Client:
(xxx) xxx-xxxx FAX				Lab Sampling:
Project Name: CCR				Job / SDG No.:
Site: Cholla				
P O #				

	Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	EPA 200.7 Rev 4.4 (B, Ca, Na, K, Mg)	EPA 300.0 (Cl, F, SO4)	SM 2540C (TDS)	SM 4500-HB (pH)	SM 2320B (HCO3)	Alkalinity	Carbonate as CaCO3	Bicarbonate as CaCO3	Sample Specific Notes:
-1	FC-CCR-MW75-121518	12/15/2018	1627	G	W	2	N	x	x	x	x	x	x	x	x	x	
-2	FC-CCR-MW38R-121518	12/15/2018	1414	G	W	2	N		x	x	x	x	x	x	x	x	
-3	FC-CCR-MW57-121518	12/15/2018	1315	G	W	2	N		x	x	x	x	x	x	x	x	
-4	FC-CCR-MW61-121518	12/15/2018	1539	G	W	2	N		x	x	x	x	x	x	x	x	
-5	FC-CCR-MW17R-121718	12/17/2018	747	G	W	2	N		x	x	x	x	x	x	x	x	
-6	FC-CCR-DMX4-121618	12/16/2018	1241	G	W	2	N		x	x	x	x	x	x	x	x	
-7	FC-CCR-FD02-121618	12/16/2018	1241	G	W	2	N		x	x	x	x	x	x	x	x	
-8	FC-CCR-MW56-121618	12/16/2018	1417	G	W	2	N		x	x	x	x	x	x	x	x	
-9	FC-CCR-MW15-121618	12/16/2018	951	G	W	2	N		x	x	x	x	x	x	x	x	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

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

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: _____ Corr'd: 2.2 | 3.7 | Therm ID No.: _____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Doug Lavarnway	APS	12/18 0933			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
				IA-PHX	12/18/18 1213

Form No. CA-C-WI-002, Rev. 4.2, dated 04/02/2013

Login Sample Receipt Checklist

Client: Arizona Public Service Company

Job Number: 550-115113-2
SDG Number: Cholla

Login Number: 115113
List Number: 1
Creator: Maycock, Lisa

List Source: TestAmerica Phoenix

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

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING



ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Phoenix
4625 East Cotton Ctr Blvd
Suite 189
Phoenix, AZ 85040
Tel: (602)437-3340

TestAmerica Job ID: 550-115114-1
TestAmerica Sample Delivery Group: Cholla
Client Project/Site: CCR

For:
Arizona Public Service Company
4801 Cholla Lake Rd
Joseph City, Arizona 86032

Attn: Doug Lavarnway

Authorized for release by:
1/17/2019 10:00:43 AM

Ken Baker, Project Manager II
(602)659-7624
ken.baker@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

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

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

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Qualifiers

HPLC/IC

Qualifier	Qualifier Description
D1	Sample required dilution due to matrix.
D2	Sample required dilution due to high concentration of analyte.
D5	Minimum Reporting Limit (MRL) adjusted due to sample dilution; analyte was non-detect in the sample.

Metals

Qualifier	Qualifier Description
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated blank spike was acceptable.
D2	Sample required dilution due to high concentration of analyte.

General Chemistry

Qualifier	Qualifier Description
D2	Sample required dilution due to high concentration of analyte.
H5	This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.

Glossary

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

Job ID: 550-115114-1

Laboratory: TestAmerica Phoenix

Narrative

Job Narrative
550-115114-1

Comments
No additional comments.

Receipt
The samples were received on 12/18/2018 12:33 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.2º C and 3.7º C.

HPLC/IC
Method(s) 300.0: The following samples were diluted for Fluoride by method EPA 300.0 due to the nature of the sample matrix: FC-CCR-MW84-121518 (550-115114-2), FC-CCR-MW85-121518 (550-115114-3), FC-CCR-MW86-121518 (550-115114-4) and FC-CCR-FD01-121518 (550-115114-5). The samples contained high concentrations of Chloride and Sulfate which exceeded the instrument's maximum column capacity. Fluoride was not detected in the diluted samples. As such, elevated reporting limits (RLs) have been provided and these data have been qualified with D1 and D5 flags.

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

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

General Chemistry
Method(s) SM 2540C:

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

Sample Summary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115114-1
SDG: Cholla

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
550-115114-1	FC-CCR-MW83-121518	Water	12/15/18 11:50	12/18/18 12:33
550-115114-2	FC-CCR-MW84-121518	Water	12/15/18 11:04	12/18/18 12:33
550-115114-3	FC-CCR-MW85-121518	Water	12/15/18 10:05	12/18/18 12:33
550-115114-4	FC-CCR-MW86-121518	Water	12/15/18 08:51	12/18/18 12:33
550-115114-5	FC-CCR-FD01-121518	Water	12/15/18 08:51	12/18/18 12:33

Detection Summary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115114-1
SDG: Cholla

Client Sample ID: FC-CCR-MW83-121518 — Lab Sample ID: 550-115114-1

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	130	D2	4.0		mg/L	2		300.0	Total/NA
Fluoride	1.8	D1	0.80		mg/L	2		300.0	Total/NA
Sulfate	3400	D2	400		mg/L	200		300.0	Total/NA
Boron	2.5		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	470	M3	2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	270	M3	2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Potassium	3.2		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Sodium	610	M3	0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Alkalinity as CaCO3	250		6.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	250		6.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	5200	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.5	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	10.6	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW84-121518 — Lab Sample ID: 550-115114-2

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	1400	D2	400		mg/L	200		300.0	Total/NA
Sulfate	8300	D2	400		mg/L	200		300.0	Total/NA
Boron	110	D2	0.20		mg/L	4		200.7 Rev 4.4	Total/NA
Calcium	490		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	1800	D2	8.0		mg/L	4		200.7 Rev 4.4	Total/NA
Potassium	33		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Sodium	660		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Alkalinity as CaCO3	410		6.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	410		6.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	14000	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.1	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	12.6	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW85-121518 — Lab Sample ID: 550-115114-3

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	680	D2	400		mg/L	200		300.0	Total/NA
Sulfate	5400	D2	400		mg/L	200		300.0	Total/NA
Boron	30		0.050		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	510		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	770		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Potassium	18		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Sodium	780		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Alkalinity as CaCO3	380		6.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	380		6.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	8700	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.3	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	11.3	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-MW86-121518 — Lab Sample ID: 550-115114-4

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	1300	D2	400		mg/L	200		300.0	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Phoenix

Client Sample ID: FC-CCR-MW86-121518 (Continued) — Lab Sample ID: 550-115114-4

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Sulfate	9400	D2	400		mg/L	200		300.0	Total/NA
Boron	120	D2	0.20		mg/L	4		200.7 Rev 4.4	Total/NA
Calcium	480		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	1700	D2	8.0		mg/L	4		200.7 Rev 4.4	Total/NA
Potassium	30		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Sodium	630		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Alkalinity as CaCO3	330		6.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	330		6.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	13000	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.1	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	11.7	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FC-CCR-FD01-121518 — Lab Sample ID: 550-115114-5

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	1300	D2	400		mg/L	200		300.0	Total/NA
Sulfate	7900	D2	400		mg/L	200		300.0	Total/NA
Boron	120	D2	0.20		mg/L	4		200.7 Rev 4.4	Total/NA
Calcium	470		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	1700	D2	8.0		mg/L	4		200.7 Rev 4.4	Total/NA
Potassium	30		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Sodium	640		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Alkalinity as CaCO3	330		6.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	330		6.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	13000	D2	100		mg/L	1		SM 2540C	Total/NA
pH	7.2	H5	1.7		SU	1		SM 4500 H+ B	Total/NA
Temperature	12.5	H5	0.1		Degrees C	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-MW83-121518

Lab Sample ID: 550-115114-1
Date Collected: 12/15/18 11:50
Matrix: Water
Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**130**	**D2**	4.0		mg/L			12/26/18 21:37	2
Fluoride	**1.8**	**D1**	0.80		mg/L			12/26/18 21:37	2
Sulfate	**3400**	**D2**	400		mg/L			12/21/18 21:30	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	**2.5**		0.050		mg/L		12/20/18 10:34	12/29/18 02:26	1
Calcium	**470**	**M3**	2.0		mg/L		12/20/18 10:34	12/27/18 12:13	1
Magnesium	**270**	**M3**	2.0		mg/L		12/20/18 10:34	12/27/18 12:13	1
Potassium	**3.2**		0.50		mg/L		12/20/18 10:34	12/27/18 12:13	1
Sodium	**610**	**M3**	0.50		mg/L		12/20/18 10:34	12/27/18 12:13	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	**250**		6.0		mg/L			12/19/18 16:04	1
Bicarbonate Alkalinity as CaCO3	**250**		6.0		mg/L			12/19/18 16:04	1
Carbonate Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 16:04	1
Alkalinity, Phenolphthalein	ND		6.0		mg/L			12/19/18 16:04	1
Hydroxide Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 16:04	1
Total Dissolved Solids	**5200**	**D2**	100		mg/L			12/19/18 11:51	1
pH	**7.5**	**H5**	1.7		SU			12/26/18 14:18	1
Temperature	**10.6**	**H5**	0.1		Degrees C			12/26/18 14:18	1

Client Sample ID: FC-CCR-MW84-121518

Lab Sample ID: 550-115114-2
Date Collected: 12/15/18 11:04
Matrix: Water
Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1400**	**D2**	400		mg/L			12/21/18 22:44	200
Fluoride	ND	D1 D5	0.80		mg/L			12/21/18 22:26	2
Sulfate	**8300**	**D2**	400		mg/L			12/21/18 22:44	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	**110**	**D2**	0.20		mg/L		12/20/18 10:34	12/29/18 04:32	4
Calcium	**490**		2.0		mg/L		12/20/18 10:34	12/27/18 13:38	1
Magnesium	**1800**	**D2**	8.0		mg/L		12/20/18 10:34	12/29/18 04:32	4
Potassium	**33**		0.50		mg/L		12/20/18 10:34	12/27/18 13:38	1
Sodium	**660**		0.50		mg/L		12/20/18 10:34	12/27/18 13:38	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	**410**		6.0		mg/L			12/19/18 16:46	1
Bicarbonate Alkalinity as CaCO3	**410**		6.0		mg/L			12/19/18 16:46	1
Carbonate Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 16:46	1
Alkalinity, Phenolphthalein	ND		6.0		mg/L			12/19/18 16:46	1
Hydroxide Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 16:46	1
Total Dissolved Solids	**14000**	**D2**	100		mg/L			12/19/18 11:51	1
pH	**7.1**	**H5**	1.7		SU			12/26/18 14:18	1

Client Sample ID: FC-CCR-MW84-121518

Lab Sample ID: 550-115114-2
Date Collected: 12/15/18 11:04
Matrix: Water
Date Received: 12/18/18 12:33

General Chemistry (Continued)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Temperature	12.6	H5	0.1		Degrees C			12/26/18 14:18	1

Client Sample ID: FC-CCR-MW85-121518

Lab Sample ID: 550-115114-3
Date Collected: 12/15/18 10:05
Matrix: Water
Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	680	D2	400		mg/L			12/21/18 23:21	200
Fluoride	ND	D1 D5	0.80		mg/L			12/21/18 23:02	2
Sulfate	5400	D2	400		mg/L			12/21/18 23:21	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	30		0.050		mg/L		12/20/18 10:34	12/29/18 04:53	1
Calcium	510		2.0		mg/L		12/20/18 10:34	12/27/18 13:44	1
Magnesium	770		2.0		mg/L		12/20/18 10:34	12/27/18 13:44	1
Potassium	18		0.50		mg/L		12/20/18 10:34	12/27/18 13:44	1
Sodium	780		0.50		mg/L		12/20/18 10:34	12/27/18 13:44	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	380		6.0		mg/L			12/19/18 16:56	1
Bicarbonate Alkalinity as CaCO3	380		6.0		mg/L			12/19/18 16:56	1
Carbonate Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 16:56	1
Alkalinity, Phenolphthalein	ND		6.0		mg/L			12/19/18 16:56	1
Hydroxide Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 16:56	1
Total Dissolved Solids	8700	D2	100		mg/L			12/19/18 11:51	1
pH	7.3	H5	1.7		SU			12/26/18 14:18	1
Temperature	11.3	H5	0.1		Degrees C			12/26/18 14:18	1

Client Sample ID: FC-CCR-MW86-121518

Lab Sample ID: 550-115114-4
Date Collected: 12/15/18 08:51
Matrix: Water
Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1300	D2	400		mg/L			12/22/18 00:34	200
Fluoride	ND	D1 D5	0.80		mg/L			12/22/18 00:16	2
Sulfate	9400	D2	400		mg/L			12/22/18 00:34	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	120	D2	0.20		mg/L		12/20/18 10:34	12/29/18 04:59	4
Calcium	480		2.0		mg/L		12/20/18 10:34	12/27/18 13:50	1
Magnesium	1700	D2	8.0		mg/L		12/20/18 10:34	12/29/18 04:59	4
Potassium	30		0.50		mg/L		12/20/18 10:34	12/27/18 13:50	1
Sodium	630		0.50		mg/L		12/20/18 10:34	12/27/18 13:50	1

Client Sample ID: FC-CCR-MW86-121518

Lab Sample ID: 550-115114-4
Date Collected: 12/15/18 08:51
Matrix: Water
Date Received: 12/18/18 12:33

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	**330**		6.0		mg/L			12/19/18 17:05	1
Bicarbonate Alkalinity as CaCO3	**330**		6.0		mg/L			12/19/18 17:05	1
Carbonate Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 17:05	1
Alkalinity, Phenolphthalein	ND		6.0		mg/L			12/19/18 17:05	1
Hydroxide Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 17:05	1
Total Dissolved Solids	**13000**	**D2**	100		mg/L			12/19/18 11:51	1
pH	**7.1**	**H5**	1.7		SU			12/26/18 14:18	1
Temperature	**11.7**	**H5**	0.1		Degrees C			12/26/18 14:18	1

Client Sample ID: FC-CCR-FD01-121518

Lab Sample ID: 550-115114-5
Date Collected: 12/15/18 08:51
Matrix: Water
Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1300**	**D2**	400		mg/L			12/22/18 01:11	200
Fluoride	ND	D1 D5	0.80		mg/L			12/22/18 00:53	2
Sulfate	**7900**	**D2**	400		mg/L			12/22/18 01:11	200

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	**120**	**D2**	0.20		mg/L		12/20/18 10:34	12/29/18 05:10	4
Calcium	**470**		2.0		mg/L		12/20/18 10:34	12/27/18 13:56	1
Magnesium	**1700**	**D2**	8.0		mg/L		12/20/18 10:34	12/29/18 05:10	4
Potassium	**30**		0.50		mg/L		12/20/18 10:34	12/27/18 13:56	1
Sodium	**640**		0.50		mg/L		12/20/18 10:34	12/27/18 13:56	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	**330**		6.0		mg/L			12/19/18 17:15	1
Bicarbonate Alkalinity as CaCO3	**330**		6.0		mg/L			12/19/18 17:15	1
Carbonate Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 17:15	1
Alkalinity, Phenolphthalein	ND		6.0		mg/L			12/19/18 17:15	1
Hydroxide Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 17:15	1
Total Dissolved Solids	**13000**	**D2**	100		mg/L			12/19/18 11:51	1
pH	**7.2**	**H5**	1.7		SU			12/26/18 14:18	1
Temperature	**12.5**	**H5**	0.1		Degrees C			12/26/18 14:18	1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 550-165329/2
Matrix: Water
Analysis Batch: 165329

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		2.0		mg/L			12/21/18 19:03	1
Fluoride	ND		0.40		mg/L			12/21/18 19:03	1
Sulfate	ND		2.0		mg/L			12/21/18 19:03	1

Lab Sample ID: LCS 550-165329/5
Matrix: Water
Analysis Batch: 165329

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride			20.0	20.9		mg/L		105	90 - 110		
Fluoride			4.00	4.06		mg/L		101	90 - 110		
Sulfate			20.0	20.0		mg/L		100	90 - 110		

Lab Sample ID: LCSD 550-165329/6
Matrix: Water
Analysis Batch: 165329

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride			20.0	21.0		mg/L		105	90 - 110	0	20
Fluoride			4.00	4.06		mg/L		101	90 - 110	0	20
Sulfate			20.0	20.1		mg/L		100	90 - 110	0	20

Lab Sample ID: 550-115113-B-1 MS ^2
Matrix: Water
Analysis Batch: 165329

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride	1.2	D1	8.00	9.53	D1	mg/L		103	80 - 120		

Lab Sample ID: 550-115113-B-1 MS ^200
Matrix: Water
Analysis Batch: 165329

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfate	4300	D2	4000	8450	D2	mg/L		103	80 - 120		

Lab Sample ID: 550-115113-B-1 MSD ^2
Matrix: Water
Analysis Batch: 165329

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	1.2	D1	8.00	9.49	D1	mg/L		103	80 - 120	0	20

Lab Sample ID: 550-115113-B-1 MSD ^200
Matrix: Water
Analysis Batch: 165329

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	4300	D2	4000	8420	D2	mg/L		102	80 - 120	0	20

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 550-115114-1 MS
Matrix: Water
Analysis Batch: 165329

Client Sample ID: FC-CCR-MW83-121518
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	3400	D2	4000	7370	D2	mg/L		100	80 - 120

Lab Sample ID: 550-115114-1 MSD
Matrix: Water
Analysis Batch: 165329

Client Sample ID: FC-CCR-MW83-121518
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	3400	D2	4000	7350	D2	mg/L		100	80 - 120	0	20

Lab Sample ID: 550-115115-B-1 MS ^200
Matrix: Water
Analysis Batch: 165329

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2300	D2	4000	6670	D2	mg/L		109	80 - 120
Sulfate	14000	D2	4000	17200	D2	mg/L		86	80 - 120

Lab Sample ID: 550-115115-B-1 MSD ^200
Matrix: Water
Analysis Batch: 165329

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	2300	D2	4000	6640	D2	mg/L		108	80 - 120	0	20
Sulfate	14000	D2	4000	17100	D2	mg/L		84	80 - 120	0	20

Lab Sample ID: MB 550-165473/1024
Matrix: Water
Analysis Batch: 165473

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		2.0		mg/L			12/26/18 20:42	1
Fluoride	ND		0.40		mg/L			12/26/18 20:42	1
Sulfate	ND		2.0		mg/L			12/26/18 20:42	1

Lab Sample ID: LCS 550-165473/25
Matrix: Water
Analysis Batch: 165473

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride			20.0	21.3		mg/L		106	90 - 110
Fluoride			4.00	4.09		mg/L		102	90 - 110
Sulfate			20.0	20.3		mg/L		101	90 - 110

Lab Sample ID: LCSD 550-165473/26
Matrix: Water
Analysis Batch: 165473

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride			20.0	21.3		mg/L		106	90 - 110	0	20

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCSD 550-165473/26
Matrix: Water
Analysis Batch: 165473

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride			4.00	4.10		mg/L		102	90 - 110	0	20
Sulfate			20.0	20.3		mg/L		102	90 - 110	0	20

Lab Sample ID: 550-115114-1 MS
Matrix: Water
Analysis Batch: 165473

Client Sample ID: FC-CCR-MW83-121518
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride	130	D2	40.0	168	D2	mg/L		89	80 - 120		
Fluoride	1.8	D1	8.00	9.94	D1	mg/L		101	80 - 120		

Lab Sample ID: 550-115114-1 MSD
Matrix: Water
Analysis Batch: 165473

Client Sample ID: FC-CCR-MW83-121518
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	130	D2	40.0	168	D2	mg/L		89	80 - 120	0	20
Fluoride	1.8	D1	8.00	10.0	D1	mg/L		102	80 - 120	1	20

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 550-164986/1-A
Matrix: Water
Analysis Batch: 165571

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 164986

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Calcium	ND		2.0		mg/L		12/20/18 10:34	12/27/18 11:36	1
Magnesium	ND		2.0		mg/L		12/20/18 10:34	12/27/18 11:36	1
Potassium	ND		0.50		mg/L		12/20/18 10:34	12/27/18 11:36	1
Sodium	ND		0.50		mg/L		12/20/18 10:34	12/27/18 11:36	1

Lab Sample ID: MB 550-164986/1-A
Matrix: Water
Analysis Batch: 165722

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 164986

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.050		mg/L		12/20/18 10:34	12/29/18 01:49	1

Lab Sample ID: LCS 550-164986/2-A
Matrix: Water
Analysis Batch: 165571

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 164986

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Calcium			21.0	22.0		mg/L		105	85 - 115		
Magnesium			21.0	21.2		mg/L		101	85 - 115		
Potassium			20.0	20.2		mg/L		101	85 - 115		
Sodium			20.0	19.9		mg/L		99	85 - 115		

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: LCS 550-164986/2-A
Matrix: Water
Analysis Batch: 165722

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 164986

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.00	1.00		mg/L		100	85 - 115

Lab Sample ID: LCSD 550-164986/3-A
Matrix: Water
Analysis Batch: 165571

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 164986

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Calcium	21.0	21.6		mg/L		103	85 - 115	2	20
Magnesium	21.0	20.9		mg/L		100	85 - 115	2	20
Potassium	20.0	19.9		mg/L		100	85 - 115	2	20
Sodium	20.0	19.5		mg/L		98	85 - 115	2	20

Lab Sample ID: LCSD 550-164986/3-A
Matrix: Water
Analysis Batch: 165722

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 164986

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	1.00	0.990		mg/L		99	85 - 115	1	20

Lab Sample ID: 550-115114-1 MS
Matrix: Water
Analysis Batch: 165571

Client Sample ID: FC-CCR-MW83-121518
Prep Type: Total/NA
Prep Batch: 164986

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Calcium	470	M3	21.0	475	M3	mg/L		25	70 - 130
Magnesium	270	M3	21.0	285	M3	mg/L		56	70 - 130
Potassium	3.2		20.0	23.0		mg/L		99	70 - 130
Sodium	610	M3	20.0	606	M3	mg/L		-4	70 - 130

Lab Sample ID: 550-115114-1 MS
Matrix: Water
Analysis Batch: 165722

Client Sample ID: FC-CCR-MW83-121518
Prep Type: Total/NA
Prep Batch: 164986

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	2.5		1.00	3.41		mg/L		94	70 - 130

Lab Sample ID: 550-115114-1 MSD
Matrix: Water
Analysis Batch: 165571

Client Sample ID: FC-CCR-MW83-121518
Prep Type: Total/NA
Prep Batch: 164986

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Calcium	470	M3	21.0	467	M3	mg/L		-15	70 - 130	2	20
Magnesium	270	M3	21.0	281	M3	mg/L		33	70 - 130	2	20
Potassium	3.2		20.0	22.8		mg/L		98	70 - 130	1	20
Sodium	610	M3	20.0	595	M3	mg/L		-54	70 - 130	2	20

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: 550-115114-1 MSD — **Client Sample ID: FC-CCR-MW83-121518**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 165722 — **Prep Batch: 164986**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	2.5		1.00	3.43		mg/L		96	70 - 130	0	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 550-164955/5 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 164955

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 14:01	1
Bicarbonate Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 14:01	1
Carbonate Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 14:01	1
Alkalinity, Phenolphthalein	ND		6.0		mg/L			12/19/18 14:01	1
Hydroxide Alkalinity as CaCO3	ND		6.0		mg/L			12/19/18 14:01	1

Lab Sample ID: LCS 550-164955/4 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 164955

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Alkalinity as CaCO3			250	249		mg/L		100	90 - 110		

Lab Sample ID: LCSD 550-164955/17 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 164955

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Alkalinity as CaCO3			250	259		mg/L		104	90 - 110	4	20

Lab Sample ID: 550-115114-1 DU — **Client Sample ID: FC-CCR-MW83-121518**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 164955

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Alkalinity as CaCO3	250			242		mg/L				1	20
Bicarbonate Alkalinity as CaCO3	250			242		mg/L				1	20
Carbonate Alkalinity as CaCO3	ND			ND		mg/L				NC	20
Alkalinity, Phenolphthalein	ND			ND		mg/L				NC	20
Hydroxide Alkalinity as CaCO3	ND			ND		mg/L				NC	20

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

Lab Sample ID: MB 550-164875/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 164875

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		20		mg/L			12/19/18 11:51	1

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

Lab Sample ID: LCS 550-164875/2
Matrix: Water
Analysis Batch: 164875

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Dissolved Solids			1000	972		mg/L		97	90 - 110		

Lab Sample ID: LCSD 550-164875/3
Matrix: Water
Analysis Batch: 164875

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids			1000	974		mg/L		97	90 - 110	0	10

Lab Sample ID: 550-115113-B-1 DU
Matrix: Water
Analysis Batch: 164875

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	6600	D2		6310	D2	mg/L				4	10

Lab Sample ID: 550-115114-1 DU
Matrix: Water
Analysis Batch: 164875

Client Sample ID: FC-CCR-MW83-121518
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	5200	D2		5060	D2	mg/L				3	10

Method: SM 4500 H+ B - pH

Lab Sample ID: LCSSRM 550-165356/1
Matrix: Water
Analysis Batch: 165356

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

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.0		SU		99.9	98.5 - 101.5		

Lab Sample ID: LCSSRM 550-165356/13
Matrix: Water
Analysis Batch: 165356

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

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.0		SU		100.0	98.5 - 101.5		

Lab Sample ID: LCSSRM 550-165356/25
Matrix: Water
Analysis Batch: 165356

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

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.0		SU		100.4	98.5 - 101.5		

Method: SM 4500 H+ B - pH (Continued)

Lab Sample ID: 550-115114-1 DU
Matrix: Water
Analysis Batch: 165356

Client Sample ID: FC-CCR-MW83-121518
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	7.5	H5		7.5	H5	SU				0.1	5
Temperature	10.6	H5		11.0	H5	Degrees C				4	

Lab Sample ID: 550-115115-B-1 DU
Matrix: Water
Analysis Batch: 165356

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	7.3	H5		7.3	H5	SU				0	5
Temperature	13.4	H5		13.6	H5	Degrees C				1	

HPLC/IC

Analysis Batch: 165329

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115114-1	FC-CCR-MW83-121518	Total/NA	Water	300.0	
550-115114-2	FC-CCR-MW84-121518	Total/NA	Water	300.0	
550-115114-2	FC-CCR-MW84-121518	Total/NA	Water	300.0	
550-115114-3	FC-CCR-MW85-121518	Total/NA	Water	300.0	
550-115114-3	FC-CCR-MW85-121518	Total/NA	Water	300.0	
550-115114-4	FC-CCR-MW86-121518	Total/NA	Water	300.0	
550-115114-4	FC-CCR-MW86-121518	Total/NA	Water	300.0	
550-115114-5	FC-CCR-FD01-121518	Total/NA	Water	300.0	
550-115114-5	FC-CCR-FD01-121518	Total/NA	Water	300.0	
MB 550-165329/2	Method Blank	Total/NA	Water	300.0	
LCS 550-165329/5	Lab Control Sample	Total/NA	Water	300.0	
LCSD 550-165329/6	Lab Control Sample Dup	Total/NA	Water	300.0	
550-115113-B-1 MS ^2	Matrix Spike	Total/NA	Water	300.0	
550-115113-B-1 MS ^200	Matrix Spike	Total/NA	Water	300.0	
550-115113-B-1 MSD ^2	Matrix Spike Duplicate	Total/NA	Water	300.0	
550-115113-B-1 MSD ^200	Matrix Spike Duplicate	Total/NA	Water	300.0	
550-115114-1 MS	FC-CCR-MW83-121518	Total/NA	Water	300.0	
550-115114-1 MSD	FC-CCR-MW83-121518	Total/NA	Water	300.0	
550-115115-B-1 MS ^200	Matrix Spike	Total/NA	Water	300.0	
550-115115-B-1 MSD ^200	Matrix Spike Duplicate	Total/NA	Water	300.0	

Analysis Batch: 165473

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115114-1	FC-CCR-MW83-121518	Total/NA	Water	300.0	
MB 550-165473/1024	Method Blank	Total/NA	Water	300.0	
LCS 550-165473/25	Lab Control Sample	Total/NA	Water	300.0	
LCSD 550-165473/26	Lab Control Sample Dup	Total/NA	Water	300.0	
550-115114-1 MS	FC-CCR-MW83-121518	Total/NA	Water	300.0	
550-115114-1 MSD	FC-CCR-MW83-121518	Total/NA	Water	300.0	

Metals

Prep Batch: 164986

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115114-1	FC-CCR-MW83-121518	Total/NA	Water	200.7	
550-115114-2	FC-CCR-MW84-121518	Total/NA	Water	200.7	
550-115114-3	FC-CCR-MW85-121518	Total/NA	Water	200.7	
550-115114-4	FC-CCR-MW86-121518	Total/NA	Water	200.7	
550-115114-5	FC-CCR-FD01-121518	Total/NA	Water	200.7	
MB 550-164986/1-A	Method Blank	Total/NA	Water	200.7	
LCS 550-164986/2-A	Lab Control Sample	Total/NA	Water	200.7	
LCSD 550-164986/3-A	Lab Control Sample Dup	Total/NA	Water	200.7	
550-115114-1 MS	FC-CCR-MW83-121518	Total/NA	Water	200.7	
550-115114-1 MSD	FC-CCR-MW83-121518	Total/NA	Water	200.7	

Analysis Batch: 165571

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115114-1	FC-CCR-MW83-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115114-2	FC-CCR-MW84-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115114-3	FC-CCR-MW85-121518	Total/NA	Water	200.7 Rev 4.4	164986

Metals (Continued)

Analysis Batch: 165571 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115114-4	FC-CCR-MW86-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115114-5	FC-CCR-FD01-121518	Total/NA	Water	200.7 Rev 4.4	164986
MB 550-164986/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	164986
LCS 550-164986/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	164986
LCSD 550-164986/3-A	Lab Control Sample Dup	Total/NA	Water	200.7 Rev 4.4	164986
550-115114-1 MS	FC-CCR-MW83-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115114-1 MSD	FC-CCR-MW83-121518	Total/NA	Water	200.7 Rev 4.4	164986

Analysis Batch: 165722

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115114-1	FC-CCR-MW83-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115114-2	FC-CCR-MW84-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115114-3	FC-CCR-MW85-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115114-4	FC-CCR-MW86-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115114-5	FC-CCR-FD01-121518	Total/NA	Water	200.7 Rev 4.4	164986
MB 550-164986/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	164986
LCS 550-164986/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	164986
LCSD 550-164986/3-A	Lab Control Sample Dup	Total/NA	Water	200.7 Rev 4.4	164986
550-115114-1 MS	FC-CCR-MW83-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115114-1 MSD	FC-CCR-MW83-121518	Total/NA	Water	200.7 Rev 4.4	164986

General Chemistry

Analysis Batch: 164875

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115114-1	FC-CCR-MW83-121518	Total/NA	Water	SM 2540C	
550-115114-2	FC-CCR-MW84-121518	Total/NA	Water	SM 2540C	
550-115114-3	FC-CCR-MW85-121518	Total/NA	Water	SM 2540C	
550-115114-4	FC-CCR-MW86-121518	Total/NA	Water	SM 2540C	
550-115114-5	FC-CCR-FD01-121518	Total/NA	Water	SM 2540C	
MB 550-164875/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 550-164875/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 550-164875/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	
550-115113-B-1 DU	Duplicate	Total/NA	Water	SM 2540C	
550-115114-1 DU	FC-CCR-MW83-121518	Total/NA	Water	SM 2540C	

Analysis Batch: 164955

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115114-1	FC-CCR-MW83-121518	Total/NA	Water	SM 2320B	
550-115114-2	FC-CCR-MW84-121518	Total/NA	Water	SM 2320B	
550-115114-3	FC-CCR-MW85-121518	Total/NA	Water	SM 2320B	
550-115114-4	FC-CCR-MW86-121518	Total/NA	Water	SM 2320B	
550-115114-5	FC-CCR-FD01-121518	Total/NA	Water	SM 2320B	
MB 550-164955/5	Method Blank	Total/NA	Water	SM 2320B	
LCS 550-164955/4	Lab Control Sample	Total/NA	Water	SM 2320B	
LCSD 550-164955/17	Lab Control Sample Dup	Total/NA	Water	SM 2320B	
550-115114-1 DU	FC-CCR-MW83-121518	Total/NA	Water	SM 2320B	

General Chemistry (Continued)

Analysis Batch: 165356

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115114-1	FC-CCR-MW83-121518	Total/NA	Water	SM 4500 H+ B	
550-115114-2	FC-CCR-MW84-121518	Total/NA	Water	SM 4500 H+ B	
550-115114-3	FC-CCR-MW85-121518	Total/NA	Water	SM 4500 H+ B	
550-115114-4	FC-CCR-MW86-121518	Total/NA	Water	SM 4500 H+ B	
550-115114-5	FC-CCR-FD01-121518	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-165356/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-165356/13	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
LCSSRM 550-165356/25	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
550-115114-1 DU	FC-CCR-MW83-121518	Total/NA	Water	SM 4500 H+ B	
550-115115-B-1 DU	Duplicate	Total/NA	Water	SM 4500 H+ B	

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115114-1
SDG: Cholla

Client Sample ID: FC-CCR-MW83-121518

Lab Sample ID: 550-115114-1

Date Collected: 12/15/18 11:50

Matrix: Water

Date Received: 12/18/18 12:33

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		200	165329	12/21/18 21:30	NEL	TAL PHX
Total/NA	Analysis	300.0		2	165473	12/26/18 21:37	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 12:13	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165722	12/29/18 02:26	SRA	TAL PHX
Total/NA	Analysis	SM 2320B		1	164955	12/19/18 16:04	DGS	TAL PHX
Total/NA	Analysis	SM 2540C		1	164875	(Start) 12/19/18 11:51 (End) 12/20/18 09:05	YET	TAL PHX
Total/NA	Analysis	SM 4500 H+ B		1	165356	12/26/18 14:18	MRR	TAL PHX

Client Sample ID: FC-CCR-MW84-121518

Lab Sample ID: 550-115114-2

Date Collected: 12/15/18 11:04

Matrix: Water

Date Received: 12/18/18 12:33

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/21/18 22:26	NEL	TAL PHX
Total/NA	Analysis	300.0		200	165329	12/21/18 22:44	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 13:38	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		4	165722	12/29/18 04:32	SRA	TAL PHX
Total/NA	Analysis	SM 2320B		1	164955	12/19/18 16:46	DGS	TAL PHX
Total/NA	Analysis	SM 2540C		1	164875	(Start) 12/19/18 11:51 (End) 12/20/18 09:05	YET	TAL PHX
Total/NA	Analysis	SM 4500 H+ B		1	165356	12/26/18 14:18	MRR	TAL PHX

Client Sample ID: FC-CCR-MW85-121518

Lab Sample ID: 550-115114-3

Date Collected: 12/15/18 10:05

Matrix: Water

Date Received: 12/18/18 12:33

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/21/18 23:02	NEL	TAL PHX
Total/NA	Analysis	300.0		200	165329	12/21/18 23:21	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 13:44	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165722	12/29/18 04:53	SRA	TAL PHX
Total/NA	Analysis	SM 2320B		1	164955	12/19/18 16:56	DGS	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115114-1
SDG: Cholla

Client Sample ID: FC-CCR-MW85-121518
Date Collected: 12/15/18 10:05
Date Received: 12/18/18 12:33

Lab Sample ID: 550-115114-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540C		1	164875		YET	TAL PHX
					(Start)	12/19/18 11:51		
					(End)	12/20/18 09:05		
Total/NA	Analysis	SM 4500 H+ B		1	165356	12/26/18 14:18	MRR	TAL PHX

Client Sample ID: FC-CCR-MW86-121518
Date Collected: 12/15/18 08:51
Date Received: 12/18/18 12:33

Lab Sample ID: 550-115114-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/22/18 00:16	NEL	TAL PHX
Total/NA	Analysis	300.0		200	165329	12/22/18 00:34	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 13:50	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		4	165722	12/29/18 04:59	SRA	TAL PHX
Total/NA	Analysis	SM 2320B		1	164955	12/19/18 17:05	DGS	TAL PHX
Total/NA	Analysis	SM 2540C		1	164875		YET	TAL PHX
					(Start)	12/19/18 11:51		
					(End)	12/20/18 09:05		
Total/NA	Analysis	SM 4500 H+ B		1	165356	12/26/18 14:18	MRR	TAL PHX

Client Sample ID: FC-CCR-FD01-121518
Date Collected: 12/15/18 08:51
Date Received: 12/18/18 12:33

Lab Sample ID: 550-115114-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/22/18 00:53	NEL	TAL PHX
Total/NA	Analysis	300.0		200	165329	12/22/18 01:11	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 13:56	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		4	165722	12/29/18 05:10	SRA	TAL PHX
Total/NA	Analysis	SM 2320B		1	164955	12/19/18 17:15	DGS	TAL PHX
Total/NA	Analysis	SM 2540C		1	164875		YET	TAL PHX
					(Start)	12/19/18 11:51		
					(End)	12/20/18 09:05		
Total/NA	Analysis	SM 4500 H+ B		1	165356	12/26/18 14:18	MRR	TAL PHX

Laboratory References:

TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

Accreditation/Certification Summary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115114-1
SDG: Cholla

Laboratory: TestAmerica Phoenix

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Arizona	State Program	9	AZ0728	06-09-19

Method Summary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115114-1
SDG: Cholla

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL PHX
200.7 Rev 4.4	Metals (ICP)	40CFR136A	TAL PHX
SM 2320B	Alkalinity	SM	TAL PHX
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PHX
SM 4500 H+ B	pH	SM	TAL PHX
200.7	Preparation, Total Metals	EPA	TAL PHX

Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.
EPA = US Environmental Protection Agency
MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
SM = "Standard Methods For The Examination Of Water And Wastewater"

Laboratory References:

TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

TestAmerica Phoenix
4625 E Cotton Center Blvd
Suite 189
Phoenix, AZ 85040
phone 602.437.3340 fax 602.454.9303

Chain of Custody Record

115114

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Regulatory Program: CCR

TestAmerica Laboratories, Inc.

Client Contact	Doug Lavarnway	Doug Lavarnway	12/17/2018	COC No:
APS Cholla	928-587-0319	Lab Contact:	Carrier:	1 of 1 COCs
4801 Cholla Lake Road	Analysis Turnaround Time			Sampler:
Joseph City, Az 86032				For Lab Use Only:
(928) 587-0319 Phone	TAT if different from Below _____			Walk-in Client:
(xxx) xxx-xxxx FAX				Lab Sampling:
Project Name: CCR				Job / SDG No.:
Site: Cholla				
P O #				

	Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	EPA 200.7 (Li, Mg, SiO2)	200.8 (Sb, As, Ba, Cd, Cr, Co, Pb, Mo, Se, Tl)	EPA 300.0 (F)	Sample Specific Notes:
-1	FC-CCR-MW83-121518	12/15/2018	1150	G	W	2	N	x	x	x	x	
-2	FC-CCR-MW84-121518	12/15/2018	1104	G	W	2	N		x	x	x	
-3	FC-CCR-MW85-121518	12/15/2018	1005	G	W	2	N		x	x	x	
-4	FC-CCR-MW86-121518	12/15/2018	851	G	W	2	N		x	x	x	
-5	FC-CCR-FD01-121518	12/15/2018	851	G	W	2	N		x	x	x	

550-115114 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

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

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments: Method 200.8 with collision cell.

2.2 | 3.7

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: _____ Corr'd: 2.2 | Therm ID No.: _____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Doug Lavarnway	APS	12/18 1233			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company: TA-PHX	Date/Time: 12/18/18 12:38

CDO

TestAmerica Phoenix
4625 E Cotton Center Blvd
Suite 189
Phoenix, AZ 85040
phone 602.437.3340 fax 602.454.9303

Chain of Custody Record

1/15/19

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

1/17/2019

Regulatory Program: CCR

TestAmerica Laboratories, Inc.

Client Contact	**Doug Lavarnway**	**Doug Lavarnway**	**12/17/2018** COC No:
APS Cholla	928-587-0319	**Lab Contact:**	**Carrier:** ___1___ of ___1___ COCs
4801 Cholla Lake Road	**Analysis Turnaround Time**		Sampler:
Joseph City, Az 86032			**For Lab Use Only:**
(928) 587-0319 Phone	TAT if different from Below _____		Walk-in Client:
(xxx) xxx-xxxx FAX			Lab Sampling:
Project Name: CCR			Job / SDG No.:
Site: Cholla			
P O #			

Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	EPA 200.7 Rev 4.4 (B, Ca, Na, K, Mg)	EPA 300.0 (Cl, F, SO4)	SM 2540C (TDS)	SM 4500-HB (pH)	SM 2320B (HCO3)	Alkalinity	Carbonate as CaCO3	Bicarbonate as CaCO3	Sample Specific Notes:
-1	FC-CCR-MW83-121518	12/15/2018	1150	G	W	2	N	x	x	x	x	x	x	x	x	x	
-2	FC-CCR-MW84-121518	12/15/2018	1104	G	W	2	N		x	x	x	x	x	x	x	x	
-3	FC-CCR-MW85-121518	12/15/2018	1005	G	W	2	N		x	x	x	x	x	x	x	x	
-4	FC-CCR-MW86-121518	12/15/2018	851	G	W	2	N		x	x	x	x	x	x	x	x	
-5	FC-CCR-FD01-121518	12/15/2018	851	G	W	2	N		x	x	x	x	x	x	x	x	

Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

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

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: _____ Corr'd: 2.2 / 3.7 | Therm ID No.: _____

Relinquished by: Doug Lavarnway	Company: APS	Date/Time: 12/18/1233	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company: TA-PHX	Date/Time: 12/18/18 12:3

TA-PHX

Login Sample Receipt Checklist

Client: Arizona Public Service Company

Job Number: 550-115114-1
SDG Number: Cholla

Login Number: 115114
List Number: 1
Creator: Maycock, Lisa

List Source: TestAmerica Phoenix

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

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ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Phoenix
4625 East Cotton Ctr Blvd
Suite 189
Phoenix, AZ 85040
Tel: (602)437-3340

TestAmerica Job ID: 550-115114-2
TestAmerica Sample Delivery Group: Cholla
Client Project/Site: CCR

For:
Arizona Public Service Company
4801 Cholla Lake Rd
Joseph City, Arizona 86032

Attn: Doug Lavarnway

Authorized for release by:
1/25/2019 8:54:33 AM

Ken Baker, Project Manager II
(602)659-7624
ken.baker@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

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

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

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Definitions/Glossary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115114-2
SDG: Cholla

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
D1	Sample required dilution due to matrix.
D5	Minimum Reporting Limit (MRL) adjusted due to sample dilution; analyte was non-detect in the sample.

Metals

Qualifier	Qualifier Description
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated blank spike was acceptable.
D2	Sample required dilution due to high concentration of analyte.

Glossary

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

Job ID: 550-115114-2

Laboratory: TestAmerica Phoenix

Narrative

Job Narrative
550-115114-2

Comments
No additional comments.

Receipt
The samples were received on 12/18/2018 12:33 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.2º C and 3.7º C.

HPLC/IC
Method(s) 300.0: The following samples were diluted for Fluoride by method EPA 300.0 due to the nature of the sample matrix: FC-CCR-MW84-121518 (550-115114-2), FC-CCR-MW85-121518 (550-115114-3), FC-CCR-MW86-121518 (550-115114-4) and FC-CCR-FD01-121518 (550-115114-5). The samples contained high concentrations of Chloride and Sulfate which exceeded the instrument's maximum column capacity. Fluoride was not detected in the diluted samples. As such, elevated reporting limits (RLs) have been provided and these data have been qualified with D1 and D5 flags.

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

Metals
Method(s) 200.8 LL: The following samples were diluted due to the nature of the sample matrix: FC-CCR-MW83-121518 (550-115114-1), FC-CCR-MW84-121518 (550-115114-2), FC-CCR-MW85-121518 (550-115114-3), FC-CCR-MW86-121518 (550-115114-4) and FC-CCR-FD01-121518 (550-115114-5). Elevated reporting limits (RLs) are provided.

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

Sample Summary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115114-2
SDG: Cholla

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
550-115114-1	FC-CCR-MW83-121518	Water	12/15/18 11:50	12/18/18 12:33
550-115114-2	FC-CCR-MW84-121518	Water	12/15/18 11:04	12/18/18 12:33
550-115114-3	FC-CCR-MW85-121518	Water	12/15/18 10:05	12/18/18 12:33
550-115114-4	FC-CCR-MW86-121518	Water	12/15/18 08:51	12/18/18 12:33
550-115114-5	FC-CCR-FD01-121518	Water	12/15/18 08:51	12/18/18 12:33

Detection Summary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115114-2
SDG: Cholla

Client Sample ID: FC-CCR-MW83-121518 — Lab Sample ID: 550-115114-1

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	1.8	D1	0.80		mg/L	2		300.0	Total/NA
Magnesium	270		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
SiO2, Silica	21		0.21		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.022		0.0010		mg/L	5		200.8 LL	Total Recoverable
Cobalt	0.0040		0.0010		mg/L	5		200.8 LL	Total Recoverable
Molybdenum	0.010		0.0010		mg/L	5		200.8 LL	Total Recoverable

Client Sample ID: FC-CCR-MW84-121518 — Lab Sample ID: 550-115114-2

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Magnesium	1800	D2	8.0		mg/L	4		200.7 Rev 4.4	Total/NA
SiO2, Silica	14		0.21		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.018		0.0010		mg/L	5		200.8 LL	Total Recoverable
Cobalt	0.011		0.0010		mg/L	5		200.8 LL	Total Recoverable
Lead	0.00067		0.00050		mg/L	5		200.8 LL	Total Recoverable
Molybdenum	0.0015		0.0010		mg/L	5		200.8 LL	Total Recoverable

Client Sample ID: FC-CCR-MW85-121518 — Lab Sample ID: 550-115114-3

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	0.25		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	770		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
SiO2, Silica	19		0.21		mg/L	1		200.7 Rev 4.4	Total/NA
Arsenic	0.0013		0.0010		mg/L	5		200.8 LL	Total Recoverable
Barium	0.026		0.0010		mg/L	5		200.8 LL	Total Recoverable
Cobalt	0.0017		0.0010		mg/L	5		200.8 LL	Total Recoverable
Lead	0.00058		0.00050		mg/L	5		200.8 LL	Total Recoverable
Molybdenum	0.0058		0.0010		mg/L	5		200.8 LL	Total Recoverable
Selenium	0.12		0.0030		mg/L	5		200.8 LL	Total Recoverable

Client Sample ID: FC-CCR-MW86-121518 — Lab Sample ID: 550-115114-4

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	0.32		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	1700	D2	8.0		mg/L	4		200.7 Rev 4.4	Total/NA
SiO2, Silica	20		0.21		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.019		0.0010		mg/L	5		200.8 LL	Total Recoverable
Cobalt	0.0092		0.0010		mg/L	5		200.8 LL	Total Recoverable

This Detection Summary does not include radiochemical test results.

TestAmerica Phoenix

Detection Summary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115114-2
SDG: Cholla

Client Sample ID: FC-CCR-MW86-121518 (Continued) — Lab Sample ID: 550-115114-4

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lead	0.00065		0.00050		mg/L	5		200.8 LL	Total Recoverable
Molybdenum	0.0041		0.0010		mg/L	5		200.8 LL	Total Recoverable
Thallium	0.00053		0.00050		mg/L	5		200.8 LL	Total Recoverable

Client Sample ID: FC-CCR-FD01-121518 — Lab Sample ID: 550-115114-5

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	0.31		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	1700	D2	8.0		mg/L	4		200.7 Rev 4.4	Total/NA
SiO2, Silica	20		0.21		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.017		0.0010		mg/L	5		200.8 LL	Total Recoverable
Cobalt	0.0087		0.0010		mg/L	5		200.8 LL	Total Recoverable
Molybdenum	0.0039		0.0010		mg/L	5		200.8 LL	Total Recoverable
Thallium	0.00052		0.00050		mg/L	5		200.8 LL	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-MW83-121518

Lab Sample ID: 550-115114-1
Date Collected: 12/15/18 11:50
Matrix: Water
Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**1.8**	**D1**	0.80		mg/L			12/26/18 21:37	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		0.20		mg/L		12/20/18 10:34	12/27/18 12:13	1
Magnesium	**270**		2.0		mg/L		12/20/18 10:34	12/27/18 12:13	1
SiO2, Silica	**21**		0.21		mg/L		12/20/18 10:34	12/29/18 02:26	1

Method: 200.8 LL - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0025		mg/L		01/18/19 09:43	01/20/19 18:56	5
Arsenic	ND		0.0010		mg/L		01/18/19 09:43	01/20/19 18:56	5
Barium	**0.022**		0.0010		mg/L		01/18/19 09:43	01/20/19 18:56	5
Cadmium	ND		0.00050		mg/L		01/18/19 09:43	01/20/19 18:56	5
Chromium	ND		0.0025		mg/L		01/18/19 09:43	01/20/19 18:56	5
Cobalt	**0.0040**		0.0010		mg/L		01/18/19 09:43	01/20/19 18:56	5
Lead	ND		0.00050		mg/L		01/18/19 09:43	01/20/19 18:56	5
Molybdenum	**0.010**		0.0010		mg/L		01/18/19 09:43	01/20/19 18:56	5
Selenium	ND		0.0030		mg/L		01/18/19 09:43	01/20/19 18:56	5
Thallium	ND		0.00050		mg/L		01/18/19 09:43	01/20/19 18:56	5

Client Sample ID: FC-CCR-MW84-121518

Lab Sample ID: 550-115114-2
Date Collected: 12/15/18 11:04
Matrix: Water
Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			12/21/18 22:26	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		0.20		mg/L		12/20/18 10:34	12/27/18 13:38	1
Magnesium	**1800**	**D2**	8.0		mg/L		12/20/18 10:34	12/29/18 04:32	4
SiO2, Silica	**14**		0.21		mg/L		12/20/18 10:34	12/29/18 04:38	1

Method: 200.8 LL - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0025		mg/L		01/18/19 09:43	01/20/19 18:58	5
Arsenic	ND		0.0010		mg/L		01/18/19 09:43	01/20/19 18:58	5
Barium	**0.018**		0.0010		mg/L		01/18/19 09:43	01/20/19 18:58	5
Cadmium	ND		0.00050		mg/L		01/18/19 09:43	01/20/19 18:58	5
Chromium	ND		0.0025		mg/L		01/18/19 09:43	01/20/19 18:58	5
Cobalt	**0.011**		0.0010		mg/L		01/18/19 09:43	01/20/19 18:58	5
Lead	**0.00067**		0.00050		mg/L		01/18/19 09:43	01/20/19 18:58	5
Molybdenum	**0.0015**		0.0010		mg/L		01/18/19 09:43	01/20/19 18:58	5
Selenium	ND		0.0030		mg/L		01/18/19 09:43	01/20/19 18:58	5
Thallium	ND		0.00050		mg/L		01/18/19 09:43	01/20/19 18:58	5

Client Sample ID: FC-CCR-MW85-121518

Lab Sample ID: 550-115114-3

Date Collected: 12/15/18 10:05

Matrix: Water

Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			12/21/18 23:02	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Lithium	**0.25**		0.20		mg/L		12/20/18 10:34	12/27/18 13:44	1
Magnesium	**770**		2.0		mg/L		12/20/18 10:34	12/27/18 13:44	1
SiO2, Silica	**19**		0.21		mg/L		12/20/18 10:34	12/29/18 04:53	1

Method: 200.8 LL - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0025		mg/L		01/18/19 09:43	01/20/19 19:00	5
Arsenic	**0.0013**		0.0010		mg/L		01/18/19 09:43	01/20/19 19:00	5
Barium	**0.026**		0.0010		mg/L		01/18/19 09:43	01/20/19 19:00	5
Cadmium	ND		0.00050		mg/L		01/18/19 09:43	01/20/19 19:00	5
Chromium	ND		0.0025		mg/L		01/18/19 09:43	01/20/19 19:00	5
Cobalt	**0.0017**		0.0010		mg/L		01/18/19 09:43	01/20/19 19:00	5
Lead	**0.00058**		0.00050		mg/L		01/18/19 09:43	01/20/19 19:00	5
Molybdenum	**0.0058**		0.0010		mg/L		01/18/19 09:43	01/20/19 19:00	5
Selenium	**0.12**		0.0030		mg/L		01/18/19 09:43	01/20/19 19:00	5
Thallium	ND		0.00050		mg/L		01/18/19 09:43	01/20/19 19:00	5

Client Sample ID: FC-CCR-MW86-121518

Lab Sample ID: 550-115114-4

Date Collected: 12/15/18 08:51

Matrix: Water

Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			12/22/18 00:16	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Lithium	**0.32**		0.20		mg/L		12/20/18 10:34	12/27/18 13:50	1
Magnesium	**1700**	**D2**	8.0		mg/L		12/20/18 10:34	12/29/18 04:59	4
SiO2, Silica	**20**		0.21		mg/L		12/20/18 10:34	12/29/18 05:04	1

Method: 200.8 LL - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0025		mg/L		01/18/19 09:43	01/20/19 19:02	5
Arsenic	ND		0.0010		mg/L		01/18/19 09:43	01/20/19 19:02	5
Barium	**0.019**		0.0010		mg/L		01/18/19 09:43	01/20/19 19:02	5
Cadmium	ND		0.00050		mg/L		01/18/19 09:43	01/20/19 19:02	5
Chromium	ND		0.0025		mg/L		01/18/19 09:43	01/20/19 19:02	5
Cobalt	**0.0092**		0.0010		mg/L		01/18/19 09:43	01/20/19 19:02	5
Lead	**0.00065**		0.00050		mg/L		01/18/19 09:43	01/20/19 19:02	5
Molybdenum	**0.0041**		0.0010		mg/L		01/18/19 09:43	01/20/19 19:02	5
Selenium	ND		0.0030		mg/L		01/18/19 09:43	01/20/19 19:02	5
Thallium	**0.00053**		0.00050		mg/L		01/18/19 09:43	01/20/19 19:02	5

Client Sample ID: FC-CCR-FD01-121518

Date Collected: 12/15/18 08:51
Date Received: 12/18/18 12:33

Lab Sample ID: 550-115114-5

Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			12/22/18 00:53	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Lithium	**0.31**		0.20		mg/L		12/20/18 10:34	12/27/18 13:56	1
Magnesium	**1700**	**D2**	8.0		mg/L		12/20/18 10:34	12/29/18 05:10	4
SiO2, Silica	**20**		0.21		mg/L		12/20/18 10:34	12/29/18 05:16	1

Method: 200.8 LL - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0025		mg/L		01/18/19 11:24	01/20/19 19:05	5
Arsenic	ND		0.0010		mg/L		01/18/19 11:24	01/20/19 19:05	5
Barium	**0.017**		0.0010		mg/L		01/18/19 11:24	01/20/19 19:05	5
Cadmium	ND		0.00050		mg/L		01/18/19 11:24	01/20/19 19:05	5
Chromium	ND		0.0025		mg/L		01/18/19 11:24	01/20/19 19:05	5
Cobalt	**0.0087**		0.0010		mg/L		01/18/19 11:24	01/20/19 19:05	5
Lead	ND		0.00050		mg/L		01/18/19 11:24	01/20/19 19:05	5
Molybdenum	**0.0039**		0.0010		mg/L		01/18/19 11:24	01/20/19 19:05	5
Selenium	ND		0.0030		mg/L		01/18/19 11:24	01/20/19 19:05	5
Thallium	**0.00052**		0.00050		mg/L		01/18/19 11:24	01/20/19 19:05	5

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 550-165329/2
Matrix: Water
Analysis Batch: 165329

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.40		mg/L			12/21/18 19:03	1

Lab Sample ID: LCS 550-165329/5
Matrix: Water
Analysis Batch: 165329

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride			4.00	4.06		mg/L		101	90 - 110		

Lab Sample ID: LCSD 550-165329/6
Matrix: Water
Analysis Batch: 165329

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride			4.00	4.06		mg/L		101	90 - 110	0	20

Lab Sample ID: 550-115113-B-1 MS ^2
Matrix: Water
Analysis Batch: 165329

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride	1.2	D1 D5	8.00	9.53	D1	mg/L		103	80 - 120		

Lab Sample ID: 550-115113-B-1 MSD ^2
Matrix: Water
Analysis Batch: 165329

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	1.2	D1 D5	8.00	9.49	D1	mg/L		103	80 - 120	0	20

Lab Sample ID: MB 550-165473/1024
Matrix: Water
Analysis Batch: 165473

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.40		mg/L			12/26/18 20:42	1

Lab Sample ID: LCS 550-165473/25
Matrix: Water
Analysis Batch: 165473

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride			4.00	4.09		mg/L		102	90 - 110		

Lab Sample ID: LCSD 550-165473/26
Matrix: Water
Analysis Batch: 165473

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride			4.00	4.10		mg/L		102	90 - 110	0	20

Lab Sample ID: 550-115114-1 MS
Matrix: Water
Analysis Batch: 165473

Client Sample ID: FC-CCR-MW83-121518
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	1.8		8.00	9.94	D1	mg/L		101	80 - 120

Lab Sample ID: 550-115114-1 MSD
Matrix: Water
Analysis Batch: 165473

Client Sample ID: FC-CCR-MW83-121518
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	1.8		8.00	10.0	D1	mg/L		102	80 - 120	1	20

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: 550-115114-1 MS
Matrix: Water
Analysis Batch: 165571

Client Sample ID: FC-CCR-MW83-121518
Prep Type: Total/NA
Prep Batch: 164986

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Lithium	0.149		1.00	1.12		mg/L		97	70 - 130
Magnesium	274		21.0	285	M3	mg/L		56	70 - 130

Lab Sample ID: 550-115114-1 MS
Matrix: Water
Analysis Batch: 165722

Client Sample ID: FC-CCR-MW83-121518
Prep Type: Total/NA
Prep Batch: 164986

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
SiO2, Silica	21.2		10.7	31.9		mg/L		100	70 - 130

Lab Sample ID: 550-115114-1 MSD
Matrix: Water
Analysis Batch: 165571

Client Sample ID: FC-CCR-MW83-121518
Prep Type: Total/NA
Prep Batch: 164986

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Lithium	0.149		1.00	1.12		mg/L		97	70 - 130	0	20
Magnesium	274		21.0	281	M3	mg/L		33	70 - 130	2	20

Lab Sample ID: 550-115114-1 MSD
Matrix: Water
Analysis Batch: 165722

Client Sample ID: FC-CCR-MW83-121518
Prep Type: Total/NA
Prep Batch: 164986

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
SiO2, Silica	21.2		10.7	32.1		mg/L		101	70 - 130	0	20

Method: 200.8 LL - Metals (ICP/MS)

Lab Sample ID: MB 440-523365/1-A
Matrix: Water
Analysis Batch: 523766

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 523365

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.00050		mg/L		01/18/19 09:43	01/20/19 17:38	1
Arsenic	ND		0.00020		mg/L		01/18/19 09:43	01/20/19 17:38	1
Barium	ND		0.00020		mg/L		01/18/19 09:43	01/20/19 17:38	1

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 440-523365/1-A
Matrix: Water
Analysis Batch: 523766

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 523365

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.00010		mg/L		01/18/19 09:43	01/20/19 17:38	1
Chromium	ND		0.00050		mg/L		01/18/19 09:43	01/20/19 17:38	1
Cobalt	ND		0.00020		mg/L		01/18/19 09:43	01/20/19 17:38	1
Lead	ND		0.00010		mg/L		01/18/19 09:43	01/20/19 17:38	1
Molybdenum	ND		0.00020		mg/L		01/18/19 09:43	01/20/19 17:38	1
Selenium	ND		0.00060		mg/L		01/18/19 09:43	01/20/19 17:38	1
Thallium	ND		0.00010		mg/L		01/18/19 09:43	01/20/19 17:38	1

Lab Sample ID: LCS 440-523365/2-A
Matrix: Water
Analysis Batch: 523766

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 523365

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Antimony			0.0800	0.0834		mg/L		104	85 - 115		
Arsenic			0.0800	0.0782		mg/L		98	85 - 115		
Barium			0.0800	0.0777		mg/L		97	85 - 115		
Cadmium			0.0800	0.0792		mg/L		99	85 - 115		
Chromium			0.0800	0.0774		mg/L		97	85 - 115		
Cobalt			0.0800	0.0778		mg/L		97	85 - 115		
Lead			0.0800	0.0780		mg/L		97	85 - 115		
Molybdenum			0.0800	0.0791		mg/L		99	85 - 115		
Selenium			0.0800	0.0772		mg/L		97	85 - 115		
Thallium			0.0800	0.0772		mg/L		97	85 - 115		

Lab Sample ID: LCSD 440-523365/3-A
Matrix: Water
Analysis Batch: 523766

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 523365

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony			0.0800	0.0884		mg/L		111	85 - 115	6	20
Arsenic			0.0800	0.0792		mg/L		99	85 - 115	1	20
Barium			0.0800	0.0793		mg/L		99	85 - 115	2	20
Cadmium			0.0800	0.0803		mg/L		100	85 - 115	1	20
Chromium			0.0800	0.0798		mg/L		100	85 - 115	3	20
Cobalt			0.0800	0.0796		mg/L		99	85 - 115	2	20
Lead			0.0800	0.0795		mg/L		99	85 - 115	2	20
Molybdenum			0.0800	0.0796		mg/L		99	85 - 115	1	20
Selenium			0.0800	0.0797		mg/L		100	85 - 115	3	20
Thallium			0.0800	0.0790		mg/L		99	85 - 115	2	20

Lab Sample ID: 550-114628-F-10-F MS ^10
Matrix: Water
Analysis Batch: 523766

Client Sample ID: Matrix Spike
Prep Type: Total Recoverable
Prep Batch: 523365

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Antimony	ND		0.0800	0.0921		mg/L		115	70 - 130		
Arsenic	ND		0.0800	0.0812		mg/L		100	70 - 130		
Barium	0.0085		0.0800	0.0902		mg/L		102	70 - 130		
Cadmium	0.0014		0.0800	0.0797		mg/L		98	70 - 130		

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Lab Sample ID: 550-114628-F-10-F MS ^10
Matrix: Water
Analysis Batch: 523766

Client Sample ID: Matrix Spike
Prep Type: Total Recoverable
Prep Batch: 523365

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	ND		0.0800	0.0776		mg/L		97	70 - 130
Cobalt	0.014		0.0800	0.0904		mg/L		96	70 - 130
Lead	ND		0.0800	0.0775		mg/L		96	70 - 130
Molybdenum	0.042		0.0800	0.122		mg/L		99	70 - 130
Selenium	ND		0.0800	0.0783		mg/L		98	70 - 130
Thallium	ND		0.0800	0.0757		mg/L		95	70 - 130

Lab Sample ID: 550-114628-F-10-G MSD ^10
Matrix: Water
Analysis Batch: 523766

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total Recoverable
Prep Batch: 523365

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	ND		0.0800	0.0912		mg/L		114	70 - 130	1	20
Arsenic	ND		0.0800	0.0821		mg/L		101	70 - 130	1	20
Barium	0.0085		0.0800	0.0911		mg/L		103	70 - 130	1	20
Cadmium	0.0014		0.0800	0.0797		mg/L		98	70 - 130	0	20
Chromium	ND		0.0800	0.0780		mg/L		98	70 - 130	1	20
Cobalt	0.014		0.0800	0.0913		mg/L		97	70 - 130	1	20
Lead	ND		0.0800	0.0778		mg/L		96	70 - 130	0	20
Molybdenum	0.042		0.0800	0.123		mg/L		101	70 - 130	1	20
Selenium	ND		0.0800	0.0777		mg/L		97	70 - 130	1	20
Thallium	ND		0.0800	0.0757		mg/L		95	70 - 130	0	20

HPLC/IC

Analysis Batch: 165329

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115114-2	FC-CCR-MW84-121518	Total/NA	Water	300.0	
550-115114-3	FC-CCR-MW85-121518	Total/NA	Water	300.0	
550-115114-4	FC-CCR-MW86-121518	Total/NA	Water	300.0	
550-115114-5	FC-CCR-FD01-121518	Total/NA	Water	300.0	
MB 550-165329/2	Method Blank	Total/NA	Water	300.0	
LCS 550-165329/5	Lab Control Sample	Total/NA	Water	300.0	
LCSD 550-165329/6	Lab Control Sample Dup	Total/NA	Water	300.0	
550-115113-B-1 MS ^2	Matrix Spike	Total/NA	Water	300.0	
550-115113-B-1 MSD ^2	Matrix Spike Duplicate	Total/NA	Water	300.0	

Analysis Batch: 165473

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115114-1	FC-CCR-MW83-121518	Total/NA	Water	300.0	
MB 550-165473/1024	Method Blank	Total/NA	Water	300.0	
LCS 550-165473/25	Lab Control Sample	Total/NA	Water	300.0	
LCSD 550-165473/26	Lab Control Sample Dup	Total/NA	Water	300.0	
550-115114-1 MS	FC-CCR-MW83-121518	Total/NA	Water	300.0	
550-115114-1 MSD	FC-CCR-MW83-121518	Total/NA	Water	300.0	

Metals

Prep Batch: 164986

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115114-1	FC-CCR-MW83-121518	Total/NA	Water	200.7	
550-115114-2	FC-CCR-MW84-121518	Total/NA	Water	200.7	
550-115114-3	FC-CCR-MW85-121518	Total/NA	Water	200.7	
550-115114-4	FC-CCR-MW86-121518	Total/NA	Water	200.7	
550-115114-5	FC-CCR-FD01-121518	Total/NA	Water	200.7	
550-115114-1 MS	FC-CCR-MW83-121518	Total/NA	Water	200.7	
550-115114-1 MSD	FC-CCR-MW83-121518	Total/NA	Water	200.7	

Analysis Batch: 165571

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115114-1	FC-CCR-MW83-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115114-2	FC-CCR-MW84-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115114-3	FC-CCR-MW85-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115114-4	FC-CCR-MW86-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115114-5	FC-CCR-FD01-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115114-1 MS	FC-CCR-MW83-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115114-1 MSD	FC-CCR-MW83-121518	Total/NA	Water	200.7 Rev 4.4	164986

Analysis Batch: 165722

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115114-1	FC-CCR-MW83-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115114-2	FC-CCR-MW84-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115114-2	FC-CCR-MW84-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115114-3	FC-CCR-MW85-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115114-4	FC-CCR-MW86-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115114-4	FC-CCR-MW86-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115114-5	FC-CCR-FD01-121518	Total/NA	Water	200.7 Rev 4.4	164986

Metals (Continued)

Analysis Batch: 165722 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115114-5	FC-CCR-FD01-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115114-1 MS	FC-CCR-MW83-121518	Total/NA	Water	200.7 Rev 4.4	164986
550-115114-1 MSD	FC-CCR-MW83-121518	Total/NA	Water	200.7 Rev 4.4	164986

Prep Batch: 523365

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115114-1	FC-CCR-MW83-121518	Total Recoverable	Water	200.2	
550-115114-2	FC-CCR-MW84-121518	Total Recoverable	Water	200.2	
550-115114-3	FC-CCR-MW85-121518	Total Recoverable	Water	200.2	
550-115114-4	FC-CCR-MW86-121518	Total Recoverable	Water	200.2	
550-115114-5	FC-CCR-FD01-121518	Total Recoverable	Water	200.2	
MB 440-523365/1-A	Method Blank	Total Recoverable	Water	200.2	
LCS 440-523365/2-A	Lab Control Sample	Total Recoverable	Water	200.2	
LCSD 440-523365/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.2	
550-114628-F-10-F MS ^10	Matrix Spike	Total Recoverable	Water	200.2	
550-114628-F-10-G MSD ^1(	Matrix Spike Duplicate	Total Recoverable	Water	200.2	

Analysis Batch: 523766

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115114-1	FC-CCR-MW83-121518	Total Recoverable	Water	200.8 LL	523365
550-115114-2	FC-CCR-MW84-121518	Total Recoverable	Water	200.8 LL	523365
550-115114-3	FC-CCR-MW85-121518	Total Recoverable	Water	200.8 LL	523365
550-115114-4	FC-CCR-MW86-121518	Total Recoverable	Water	200.8 LL	523365
550-115114-5	FC-CCR-FD01-121518	Total Recoverable	Water	200.8 LL	523365
MB 440-523365/1-A	Method Blank	Total Recoverable	Water	200.8 LL	523365
LCS 440-523365/2-A	Lab Control Sample	Total Recoverable	Water	200.8 LL	523365
LCSD 440-523365/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.8 LL	523365
550-114628-F-10-F MS ^10	Matrix Spike	Total Recoverable	Water	200.8 LL	523365
550-114628-F-10-G MSD ^1(	Matrix Spike Duplicate	Total Recoverable	Water	200.8 LL	523365

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115114-2
SDG: Cholla

Client Sample ID: FC-CCR-MW83-121518
Lab Sample ID: 550-115114-1
Date Collected: 12/15/18 11:50
Matrix: Water
Date Received: 12/18/18 12:33

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165473	12/26/18 21:37	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 12:13	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165722	12/29/18 02:26	SRA	TAL PHX
Total Recoverable	Prep	200.2			523365	01/18/19 09:43	BV	TAL IRV
Total Recoverable	Analysis	200.8 LL		5	523766	01/20/19 18:56	MQP	TAL IRV

Client Sample ID: FC-CCR-MW84-121518
Lab Sample ID: 550-115114-2
Date Collected: 12/15/18 11:04
Matrix: Water
Date Received: 12/18/18 12:33

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/21/18 22:26	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 13:38	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		4	165722	12/29/18 04:32	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165722	12/29/18 04:38	SRA	TAL PHX
Total Recoverable	Prep	200.2			523365	01/18/19 09:43	BV	TAL IRV
Total Recoverable	Analysis	200.8 LL		5	523766	01/20/19 18:58	MQP	TAL IRV

Client Sample ID: FC-CCR-MW85-121518
Lab Sample ID: 550-115114-3
Date Collected: 12/15/18 10:05
Matrix: Water
Date Received: 12/18/18 12:33

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/21/18 23:02	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 13:44	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165722	12/29/18 04:53	SRA	TAL PHX
Total Recoverable	Prep	200.2			523365	01/18/19 09:43	BV	TAL IRV
Total Recoverable	Analysis	200.8 LL		5	523766	01/20/19 19:00	MQP	TAL IRV

Client Sample ID: FC-CCR-MW86-121518
Lab Sample ID: 550-115114-4
Date Collected: 12/15/18 08:51
Matrix: Water
Date Received: 12/18/18 12:33

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/22/18 00:16	NEL	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115114-2
SDG: Cholla

Client Sample ID: FC-CCR-MW86-121518

Date Collected: 12/15/18 08:51
Date Received: 12/18/18 12:33

Lab Sample ID: 550-115114-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 13:50	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		4	165722	12/29/18 04:59	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165722	12/29/18 05:04	SRA	TAL PHX
Total Recoverable	Prep	200.2			523365	01/18/19 09:43	BV	TAL IRV
Total Recoverable	Analysis	200.8 LL		5	523766	01/20/19 19:02	MQP	TAL IRV

Client Sample ID: FC-CCR-FD01-121518

Date Collected: 12/15/18 08:51
Date Received: 12/18/18 12:33

Lab Sample ID: 550-115114-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/22/18 00:53	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 13:56	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		4	165722	12/29/18 05:10	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165722	12/29/18 05:16	SRA	TAL PHX
Total Recoverable	Prep	200.2			523365	01/18/19 11:24	BV	TAL IRV
Total Recoverable	Analysis	200.8 LL		5	523766	01/20/19 19:05	MQP	TAL IRV

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

Accreditation/Certification Summary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115114-2
SDG: Cholla

Laboratory: TestAmerica Phoenix

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Arizona	State Program	9	AZ0728	06-09-19

Laboratory: TestAmerica Irvine

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Arizona	State Program	9	AZ0671	10-14-19

Method Summary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115114-2
SDG: Cholla

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL PHX
200.7 Rev 4.4	Metals (ICP)	40CFR136A	TAL PHX
200.8 LL	Metals (ICP/MS)	EPA	TAL IRV
200.2	Preparation, Total Recoverable Metals	EPA	TAL IRV
200.7	Preparation, Total Metals	EPA	TAL PHX

Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.
EPA = US Environmental Protection Agency
MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022
TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

TestAmerica Phoenix
4625 E Cotton Center Blvd
Suite 189
Phoenix, AZ 85040
phone 602.437.3340 fax 602.454.9303

Chain of Custody Record

115114

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Regulatory Program: CCR

TestAmerica Laboratories, Inc.

Client Contact	Doug Lavarnway	Doug Lavarnway	12/17/2018	COC No:
APS Cholla	928-587-0319	Lab Contact:	Carrier:	1 of 1 COCs
4801 Cholla Lake Road	Analysis Turnaround Time			Sampler:
Joseph City, Az 86032				For Lab Use Only:
(928) 587-0319 Phone	TAT if different from Below _____			Walk-in Client:
(xxx) xxx-xxxx FAX				Lab Sampling:
Project Name: CCR				Job / SDG No.:
Site: Cholla				
P O #				

	Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	EPA 200.7 (Li, Mg, SiO2)	200.8 (Sb, As, Ba, Cd, Cr, Co, Pb, Mo, Se, Tl)		EPA 300.0 (F)	Sample Specific Notes:
-1	FC-CCR-MW83-121518	12/15/2018	1150	G	W	2	N	x	x	x		x	
-2	FC-CCR-MW84-121518	12/15/2018	1104	G	W	2	N		x	x		x	
-3	FC-CCR-MW85-121518	12/15/2018	1005	G	W	2	N		x	x		x	
-4	FC-CCR-MW86-121518	12/15/2018	851	G	W	2	N		x	x		x	
-5	FC-CCR-FD01-121518	12/15/2018	851	G	W	2	N		x	x		x	

550-115114 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

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

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments: Method 200.8 with collision cell.

2.2 | 3.7

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: _____ Corr'd: 2.2 | Therm ID No.: _____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Doug Lavarnway	APS	12/18 1233			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company: TA-PHX	Date/Time: 12/18/18 12:38

CDO

TestAmerica Phoenix
4625 E Cotton Center Blvd
Suite 189
Phoenix, AZ 85040
phone 602.437.3340 fax 602.454.9303

Chain of Custody Record

1/15/19

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

1/25/2019

Regulatory Program: CCR

TestAmerica Laboratories, Inc.

Client Contact	**Doug Lavarnway**	**Doug Lavarnway**	**12/17/2018**
APS Cholla	928-587-0319	**Lab Contact:**	**Carrier:**
4801 Cholla Lake Road	**Analysis Turnaround Time**		
Joseph City, Az 86032			
(928) 587-0319 Phone	TAT if different from Below _____		
(xxx) xxx-xxxx FAX			
Project Name: CCR			
Site: Cholla			
P O #			

COC No: ___1___ of ___1___ COCs
Sampler:
For Lab Use Only:
Walk-in Client:
Lab Sampling:
Job / SDG No.:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	EPA 200.7 Rev 4.4 (B, Ca, Na, K, Mg)	EPA 300.0 (Cl, F, SO4)	SM 2540C (TDS)	SM 4500-HB (pH)	SM 2320B (HCO3)	Alkalinity	Carbonate as CaCO3	Bicarbonate as CaCO3	Sample Specific Notes:
-1 FC-CCR-MW83-121518	12/15/2018	1150	G	W	2	N	x	x	x	x	x	x	x	x	x	
-2 FC-CCR-MW84-121518	12/15/2018	1104	G	W	2	N		x	x	x	x	x	x	x	x	
-3 FC-CCR-MW85-121518	12/15/2018	1005	G	W	2	N		x	x	x	x	x	x	x	x	
-4 FC-CCR-MW86-121518	12/15/2018	851	G	W	2	N		x	x	x	x	x	x	x	x	
-5 FC-CCR-FD01-121518	12/15/2018	851	G	W	2	N		x	x	x	x	x	x	x	x	

Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

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

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: _____ Corr'd: 2.2 / 3.7 | Therm ID No.: _____

Relinquished by: Doug Lavarnway	Company: APS	Date/Time: 12/18/1233	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company: TA-PHX	Date/Time: 12/18/18 12:3

TA-PHX

TestAmerica Phoenix
4625 East Cotton Ctr Blvd Suite 189
Phoenix, AZ 85040
Phone (602) 437-3340 Fax (602) 454-9303

Chain of Custody Record

TestAmerica

Client Information (Sub Contract Lab)	Sampler	Lab PM: Baker, Ken	Carrier Tracking No(s)	COC No: 550-23340.1
Client Contact: Shipping/Receiving	Phone	E-Mail: ken.baker@testamericainc.com	State of Origin: Arizona	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc		Accreditations Required (See note): State Program - Arizona		Job #: 550-115114-2
Address: 17461 Denan Ave, Suite 100,	Due Date Requested: 1/21/2019			
City: Irvine	TAT Requested (days):			
State, Zip: CA, 92614-5817				
Phone: 949-261-1022(Tel) 949-260-3297(Fax)	PO #			
Email	WO #			
Project Name: CCR	Project #: 55009651			
Site: Arizona Public Service	SSOW#			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	200.8_CWA_LL/200.2 200.8 Metals	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
FC-CCR-MW83-121518 (550-115114-1)	12/15/18	11:50 Arizona		Water			X	1	AZ Sample! Do not dilute if at all possible!
FC-CCR-MW83-121518 (550-115114-1MS)	12/15/18	11:50 Arizona	MS	Water			X	1	AZ Sample! Do not dilute if at all possible!
FC-CCR-MW83-121518 (550-115114-1MSD)	12/15/18	11:50 Arizona	MSD	Water			X	1	AZ Sample! Do not dilute if at all possible!
FC-CCR-MW84-121518 (550-115114-2)	12/15/18	11:04 Arizona		Water			X	1	AZ Sample! Do not dilute if at all possible!
FC-CCR-MW85-121518 (550-115114-3)	12/15/18	10:05 Arizona		Water			X	1	AZ Sample! Do not dilute if at all possible!
FC-CCR-MW86-121518 (550-115114-4)	12/15/18	08:51 Arizona		Water			X	1	AZ Sample! Do not dilute if at all possible!
FC-CCR-FD01-121518 (550-115114-5)	12/15/18	08:51 Arizona		Water			X	1	AZ Sample! Do not dilute if at all possible!

Note Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories This sample shipment is forwarded under chain-of-custody If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc attention immediately If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested. I, II, III, IV, Other (specify) Primary Deliverable Rank. 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date.	Time	Method of Shipment		
Relinquished by: [signature]	Date/Time: 01-14-19 1535 TA PHX	Company: VB	Received by	Date/Time	Company
Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Relinquished by	Date/Time	Company	Received by: Olga Quelas	Date/Time: 1/15/19 1000	Company: TA IRV
Custody Seals Intact. ☑ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks	17.0/17.2 IR-941	

Ver 09/20/2016

Login Sample Receipt Checklist

Client: Arizona Public Service Company

Job Number: 550-115114-2
SDG Number: Cholla

Login Number: 115114
List Number: 1
Creator: Maycock, Lisa

List Source: TestAmerica Phoenix

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

Login Sample Receipt Checklist

Client: Arizona Public Service Company

Job Number: 550-115114-2
SDG Number: Cholla

Login Number: 115114
List Number: 2
Creator: Ornelas, Olga

List Source: TestAmerica Irvine
List Creation: 01/15/19 05:27 PM

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

Login Sample Receipt Checklist

Client: Arizona Public Service Company

Job Number: 550-115114-2
SDG Number: Cholla

Login Number: 115114
List Number: 3
Creator: Escalante, Maria I

List Source: TestAmerica Irvine
List Creation: 01/18/19 03:37 PM

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

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING



ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Phoenix
4625 East Cotton Ctr Blvd
Suite 189
Phoenix, AZ 85040
Tel: (602)437-3340

TestAmerica Job ID: 550-115115-2
TestAmerica Sample Delivery Group: Cholla
Client Project/Site: CCR

For:
Arizona Public Service Company
4801 Cholla Lake Rd
Joseph City, Arizona 86032

Attn: Doug Lavarnway

Authorized for release by:
1/22/2019 12:38:12 PM

Ken Baker, Project Manager II
(602)659-7624
ken.baker@testamericainc.com

LINKS

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

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

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Definitions/Glossary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115115-2
SDG: Cholla

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
D1	Sample required dilution due to matrix.
D5	Minimum Reporting Limit (MRL) adjusted due to sample dilution; analyte was non-detect in the sample.

Metals

Qualifier	Qualifier Description
D2	Sample required dilution due to high concentration of analyte.
D1	Sample required dilution due to matrix.
M1	Matrix spike recovery was high, the associated blank spike recovery was acceptable.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated blank spike was acceptable.

Glossary

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

Case Narrative

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115115-2
SDG: Cholla

Job ID: 550-115115-2

Laboratory: TestAmerica Phoenix

Narrative

Job Narrative
550-115115-2

Comments
No additional comments.

Receipt
The samples were received on 12/18/2018 12:33 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.2º C and 3.7º C.

HPLC/IC
Method(s) 300.0: The following samples were diluted for Fluoride by method EPA 300.0 due to the nature of the sample matrix: FC-CCR-DMX6-121618 (550-115115-1), FC-CCR-DMX6-121618 (550-115115-1[MS]) and FC-CCR-DMX6-121618 (550-115115-1[MSD]). The samples contained high concentrations of Chloride and Sulfate which exceeded the instrument's maximum column capacity. Fluoride was not detected in the diluted samples. As such, elevated reporting limits (RLs) have been provided and these data have been qualified with D1 and D5 flags.

Method(s) 300.0: The following samples were diluted for Fluoride by method EPA 300.0 due to the nature of the sample matrix: FC-CCR-MW7-121718 (550-115115-2), FC-CCR-MW6-121618 (550-115115-3) and FC-CCR-MW16-121618 (550-115115-4). The samples contained high concentrations of Chloride and Sulfate which exceeded the instrument's maximum column capacity. Fluoride was not detected in the diluted samples. As such, elevated reporting limits (RLs) have been provided and these data have been qualified with D1 and D5 flags.

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

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

Sample Summary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115115-2
SDG: Cholla

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
550-115115-1	FC-CCR-DMX6-121618	Water	12/16/18 10:36	12/18/18 12:33
550-115115-2	FC-CCR-MW7-121718	Water	12/17/18 08:56	12/18/18 12:33
550-115115-3	FC-CCR-MW6-121618	Water	12/16/18 11:49	12/18/18 12:33
550-115115-4	FC-CCR-MW16-121618	Water	12/16/18 08:54	12/18/18 12:33

Detection Summary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115115-2
SDG: Cholla

Client Sample ID: FC-CCR-DMX6-121618 — Lab Sample ID: 550-115115-1

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	1.7		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	560		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
SiO2, Silica	17	D2	0.86		mg/L	4		200.7 Rev 4.4	Total/NA
Barium	0.025	D1	0.010		mg/L	20		200.8 LL	Total/NA
Selenium	0.014	D1 M1	0.010		mg/L	20		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW7-121718 — Lab Sample ID: 550-115115-2

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	0.84		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	420		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
SiO2, Silica	15		0.21		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.015	D1	0.010		mg/L	20		200.8 LL	Total/NA
Selenium	0.022	D1	0.010		mg/L	20		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW6-121618 — Lab Sample ID: 550-115115-3

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	1.1		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	600		2.0		mg/L	1		200.7 Rev 4.4	Total/NA
SiO2, Silica	10		0.21		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.020	D1	0.010		mg/L	20		200.8 LL	Total/NA
Selenium	0.015	D1	0.010		mg/L	20		200.8 LL	Total/NA

Client Sample ID: FC-CCR-MW16-121618 — Lab Sample ID: 550-115115-4

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Lithium	1.1		0.20		mg/L	1		200.7 Rev 4.4	Total/NA
Magnesium	1200	D2	8.0		mg/L	4		200.7 Rev 4.4	Total/NA
SiO2, Silica	12		0.21		mg/L	1		200.7 Rev 4.4	Total/NA
Barium	0.026	D1	0.010		mg/L	20		200.8 LL	Total/NA
Selenium	0.060	D1	0.010		mg/L	20		200.8 LL	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FC-CCR-DMX6-121618

Lab Sample ID: 550-115115-1

Date Collected: 12/16/18 10:36
Matrix: Water
Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			12/27/18 01:54	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Lithium	**1.7**		0.20		mg/L		12/20/18 10:34	12/27/18 12:31	1
Magnesium	**560**		2.0		mg/L		12/20/18 10:34	12/27/18 12:31	1
SiO2, Silica	**17**	**D2**	0.86		mg/L		12/20/18 10:34	12/29/18 02:56	4

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	D1	0.020		mg/L		12/19/18 11:06	01/14/19 21:42	20
Arsenic	ND	D1	0.010		mg/L		12/19/18 11:06	01/14/19 21:42	20
Barium	**0.025**	**D1**	0.010		mg/L		12/19/18 11:06	01/14/19 21:42	20
Cadmium	ND	D1	0.0020		mg/L		12/19/18 11:06	01/14/19 21:42	20
Chromium	ND	D1	0.020		mg/L		12/19/18 11:06	01/14/19 21:42	20
Cobalt	ND	D1	0.010		mg/L		12/19/18 11:06	01/14/19 21:42	20
Lead	ND	D1	0.010		mg/L		12/19/18 11:06	01/14/19 21:42	20
Molybdenum	ND	D1	0.010		mg/L		12/19/18 11:06	01/14/19 21:42	20
Selenium	**0.014**	**D1 M1**	0.010		mg/L		12/19/18 11:06	01/16/19 23:01	20
Thallium	ND	D1	0.0020		mg/L		12/19/18 11:06	01/14/19 21:42	20

Client Sample ID: FC-CCR-MW7-121718

Lab Sample ID: 550-115115-2

Date Collected: 12/17/18 08:56
Matrix: Water
Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			12/22/18 05:47	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Lithium	**0.84**		0.20		mg/L		12/20/18 10:34	12/27/18 14:02	1
Magnesium	**420**		2.0		mg/L		12/20/18 10:34	12/27/18 14:02	1
SiO2, Silica	**15**		0.21		mg/L		12/20/18 10:34	12/29/18 05:22	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	D1	0.020		mg/L		12/19/18 11:06	01/14/19 21:57	20
Arsenic	ND	D1	0.010		mg/L		12/19/18 11:06	01/14/19 21:57	20
Barium	**0.015**	**D1**	0.010		mg/L		12/19/18 11:06	01/14/19 21:57	20
Cadmium	ND	D1	0.0020		mg/L		12/19/18 11:06	01/14/19 21:57	20
Chromium	ND	D1	0.020		mg/L		12/19/18 11:06	01/14/19 21:57	20
Cobalt	ND	D1	0.010		mg/L		12/19/18 11:06	01/14/19 21:57	20
Lead	ND	D1	0.010		mg/L		12/19/18 11:06	01/14/19 21:57	20
Molybdenum	ND	D1	0.010		mg/L		12/19/18 11:06	01/14/19 21:57	20
Selenium	**0.022**	**D1**	0.010		mg/L		12/19/18 11:06	01/16/19 23:16	20
Thallium	ND	D1	0.0020		mg/L		12/19/18 11:06	01/14/19 21:57	20

Client Sample ID: FC-CCR-MW6-121618

Lab Sample ID: 550-115115-3

Date Collected: 12/16/18 11:49

Matrix: Water

Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			12/22/18 06:24	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Lithium	**1.1**		0.20		mg/L		12/20/18 10:34	12/27/18 14:08	1
Magnesium	**600**		2.0		mg/L		12/20/18 10:34	12/27/18 14:08	1
SiO2, Silica	**10**		0.21		mg/L		12/20/18 10:34	12/29/18 05:34	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	D1	0.020		mg/L		12/19/18 11:06	01/14/19 22:00	20
Arsenic	ND	D1	0.010		mg/L		12/19/18 11:06	01/14/19 22:00	20
Barium	**0.020**	**D1**	0.010		mg/L		12/19/18 11:06	01/14/19 22:00	20
Cadmium	ND	D1	0.0020		mg/L		12/19/18 11:06	01/14/19 22:00	20
Chromium	ND	D1	0.020		mg/L		12/19/18 11:06	01/14/19 22:00	20
Cobalt	ND	D1	0.010		mg/L		12/19/18 11:06	01/14/19 22:00	20
Lead	ND	D1	0.010		mg/L		12/19/18 11:06	01/14/19 22:00	20
Molybdenum	ND	D1	0.010		mg/L		12/19/18 11:06	01/14/19 22:00	20
Selenium	**0.015**	**D1**	0.010		mg/L		12/19/18 11:06	01/16/19 23:18	20
Thallium	ND	D1	0.0020		mg/L		12/19/18 11:06	01/14/19 22:00	20

Client Sample ID: FC-CCR-MW16-121618

Lab Sample ID: 550-115115-4

Date Collected: 12/16/18 08:54

Matrix: Water

Date Received: 12/18/18 12:33

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	D1 D5	0.80		mg/L			12/22/18 13:09	2

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Lithium	**1.1**		0.20		mg/L		12/20/18 10:34	12/27/18 14:14	1
Magnesium	**1200**	**D2**	8.0		mg/L		12/20/18 10:34	12/29/18 05:40	4
SiO2, Silica	**12**		0.21		mg/L		12/20/18 10:34	12/29/18 05:46	1

Method: 200.8 LL - Metals (ICP/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	D1	0.020		mg/L		12/19/18 11:06	01/14/19 22:02	20
Arsenic	ND	D1	0.010		mg/L		12/19/18 11:06	01/14/19 22:02	20
Barium	**0.026**	**D1**	0.010		mg/L		12/19/18 11:06	01/14/19 22:02	20
Cadmium	ND	D1	0.0020		mg/L		12/19/18 11:06	01/14/19 22:02	20
Chromium	ND	D1	0.020		mg/L		12/19/18 11:06	01/14/19 22:02	20
Cobalt	ND	D1	0.010		mg/L		12/19/18 11:06	01/14/19 22:02	20
Lead	ND	D1	0.010		mg/L		12/19/18 11:06	01/14/19 22:02	20
Molybdenum	ND	D1	0.010		mg/L		12/19/18 11:06	01/14/19 22:02	20
Selenium	**0.060**	**D1**	0.010		mg/L		12/19/18 11:06	01/16/19 23:21	20
Thallium	ND	D1	0.0020		mg/L		12/19/18 11:06	01/14/19 22:02	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: 550-115115-1 MS
Matrix: Water
Analysis Batch: 165473

Client Sample ID: FC-CCR-DMX6-121618
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	ND		8.00	7.91	D1	mg/L		93	80 - 120

Lab Sample ID: 550-115115-1 MSD
Matrix: Water
Analysis Batch: 165473

Client Sample ID: FC-CCR-DMX6-121618
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	ND		8.00	7.98	D1	mg/L		94	80 - 120	1	20

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 550-164986/1-A
Matrix: Water
Analysis Batch: 165571

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 164986

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		0.20		mg/L		12/20/18 10:34	12/27/18 11:36	1
Magnesium	ND		2.0		mg/L		12/20/18 10:34	12/27/18 11:36	1

Lab Sample ID: MB 550-164986/1-A
Matrix: Water
Analysis Batch: 165722

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 164986

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
SiO2, Silica	ND		0.21		mg/L		12/20/18 10:34	12/29/18 01:49	1

Lab Sample ID: LCS 550-164986/2-A
Matrix: Water
Analysis Batch: 165571

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 164986

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Lithium			1.00	1.03		mg/L		103	85 - 115
Magnesium			21.0	21.2		mg/L		101	85 - 115

Lab Sample ID: LCS 550-164986/2-A
Matrix: Water
Analysis Batch: 165722

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 164986

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
SiO2, Silica			10.7	10.6		mg/L		99	85 - 115

Lab Sample ID: LCSD 550-164986/3-A
Matrix: Water
Analysis Batch: 165571

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 164986

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Lithium			1.00	1.02		mg/L		102	85 - 115	1	20
Magnesium			21.0	20.9		mg/L		100	85 - 115	2	20

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: LCSD 550-164986/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 165722 — **Prep Batch: 164986**

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
SiO2, Silica			10.7	10.5		mg/L		98	85 - 115	1	20

Lab Sample ID: 550-115115-1 MS — **Client Sample ID: FC-CCR-DMX6-121618**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 165571 — **Prep Batch: 164986**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Lithium	1.67		1.00	2.54		mg/L		87	70 - 130
Magnesium	559		21.0	556	M3	mg/L		-12	70 - 130

Lab Sample ID: 550-115115-1 MS — **Client Sample ID: FC-CCR-DMX6-121618**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 165722 — **Prep Batch: 164986**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
SiO2, Silica	17.1		10.7	28.5		mg/L		107	70 - 130

Lab Sample ID: 550-115115-1 MSD — **Client Sample ID: FC-CCR-DMX6-121618**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 165571 — **Prep Batch: 164986**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Lithium	1.67		1.00	2.59		mg/L		92	70 - 130	2	20
Magnesium	559		21.0	559	M3	mg/L		0.3	70 - 130	0	20

Lab Sample ID: 550-115115-1 MSD — **Client Sample ID: FC-CCR-DMX6-121618**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 165722 — **Prep Batch: 164986**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
SiO2, Silica	17.1		10.7	28.1		mg/L		103	70 - 130	2	20

Method: 200.8 LL - Metals (ICP/MS)

Lab Sample ID: MB 550-164867/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 166694 — **Prep Batch: 164867**

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0010		mg/L		12/19/18 11:06	01/14/19 21:35	1
Arsenic	ND		0.00050		mg/L		12/19/18 11:06	01/14/19 21:35	1
Barium	ND		0.00050		mg/L		12/19/18 11:06	01/14/19 21:35	1
Cadmium	ND		0.00010		mg/L		12/19/18 11:06	01/14/19 21:35	1
Chromium	ND		0.0010		mg/L		12/19/18 11:06	01/14/19 21:35	1
Cobalt	ND		0.00050		mg/L		12/19/18 11:06	01/14/19 21:35	1
Lead	ND		0.00050		mg/L		12/19/18 11:06	01/14/19 21:35	1
Molybdenum	ND		0.00050		mg/L		12/19/18 11:06	01/14/19 21:35	1
Thallium	ND		0.00010		mg/L		12/19/18 11:06	01/14/19 21:35	1

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 550-164867/1-A
Matrix: Water
Analysis Batch: 166913

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 164867

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Selenium	ND		0.00050		mg/L		12/19/18 11:06	01/16/19 22:54	1

Lab Sample ID: LCS 550-164867/2-A
Matrix: Water
Analysis Batch: 166694

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 164867

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Antimony			0.100	0.107		mg/L		107	85 - 115		
Arsenic			0.100	0.102		mg/L		102	85 - 115		
Barium			0.100	0.100		mg/L		100	85 - 115		
Cadmium			0.100	0.107		mg/L		107	85 - 115		
Chromium			0.100	0.104		mg/L		104	85 - 115		
Cobalt			0.100	0.103		mg/L		103	85 - 115		
Lead			0.100	0.101		mg/L		101	85 - 115		
Molybdenum			0.100	0.105		mg/L		105	85 - 115		
Thallium			0.100	0.104		mg/L		104	85 - 115		

Lab Sample ID: LCS 550-164867/2-A
Matrix: Water
Analysis Batch: 166913

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 164867

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Selenium			0.100	0.102		mg/L		102	85 - 115		

Lab Sample ID: LCSD 550-164867/3-A
Matrix: Water
Analysis Batch: 166694

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 164867

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony			0.100	0.105		mg/L		105	85 - 115	1	20
Arsenic			0.100	0.103		mg/L		103	85 - 115	1	20
Barium			0.100	0.0958		mg/L		96	85 - 115	4	20
Cadmium			0.100	0.104		mg/L		104	85 - 115	2	20
Chromium			0.100	0.104		mg/L		104	85 - 115	0	20
Cobalt			0.100	0.103		mg/L		103	85 - 115	1	20
Lead			0.100	0.0999		mg/L		100	85 - 115	1	20
Molybdenum			0.100	0.104		mg/L		104	85 - 115	1	20
Thallium			0.100	0.102		mg/L		102	85 - 115	2	20

Lab Sample ID: LCSD 550-164867/3-A
Matrix: Water
Analysis Batch: 166913

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 164867

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Selenium			0.100	0.104		mg/L		104	85 - 115	1	20

Method: 200.8 LL - Metals (ICP/MS) (Continued)

Lab Sample ID: 550-115115-1 MS — **Client Sample ID: FC-CCR-DMX6-121618**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 166694 — **Prep Batch: 164867**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	ND	D1	0.100	0.123		mg/L		123	70 - 130
Arsenic	ND	D1	0.100	0.125		mg/L		125	70 - 130
Barium	0.025	D1	0.100	0.122		mg/L		97	70 - 130
Cadmium	ND	D1	0.100	0.115		mg/L		114	70 - 130
Chromium	ND	D1	0.100	0.118		mg/L		118	70 - 130
Cobalt	ND	D1	0.100	0.117		mg/L		113	70 - 130
Lead	ND	D1	0.100	0.105		mg/L		105	70 - 130
Molybdenum	ND	D1	0.100	0.129		mg/L		123	70 - 130
Thallium	ND	D1	0.100	0.107		mg/L		107	70 - 130

Lab Sample ID: 550-115115-1 MS — **Client Sample ID: FC-CCR-DMX6-121618**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 166913 — **Prep Batch: 164867**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Selenium	0.014	M1 D1	0.100	0.234	M1	mg/L		220	70 - 130

Lab Sample ID: 550-115115-1 MSD — **Client Sample ID: FC-CCR-DMX6-121618**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 166694 — **Prep Batch: 164867**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	ND	D1	0.100	0.117		mg/L		117	70 - 130	5	20
Arsenic	ND	D1	0.100	0.126		mg/L		126	70 - 130	1	20
Barium	0.025	D1	0.100	0.118		mg/L		93	70 - 130	3	20
Cadmium	ND	D1	0.100	0.107		mg/L		106	70 - 130	7	20
Chromium	ND	D1	0.100	0.113		mg/L		113	70 - 130	5	20
Cobalt	ND	D1	0.100	0.112		mg/L		108	70 - 130	5	20
Lead	ND	D1	0.100	0.0991		mg/L		99	70 - 130	6	20
Molybdenum	ND	D1	0.100	0.118		mg/L		113	70 - 130	8	20
Thallium	ND	D1	0.100	0.101		mg/L		101	70 - 130	5	20

Lab Sample ID: 550-115115-1 MSD — **Client Sample ID: FC-CCR-DMX6-121618**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 166913 — **Prep Batch: 164867**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Selenium	0.014	M1 D1	0.100	0.194	M1	mg/L		180	70 - 130	19	20

QC Association Summary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115115-2
SDG: Cholla

HPLC/IC

Analysis Batch: 165329

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115115-2	FC-CCR-MW7-121718	Total/NA	Water	300.0	
550-115115-3	FC-CCR-MW6-121618	Total/NA	Water	300.0	
550-115115-4	FC-CCR-MW16-121618	Total/NA	Water	300.0	

Analysis Batch: 165473

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115115-1	FC-CCR-DMX6-121618	Total/NA	Water	300.0	
550-115115-1 MS	FC-CCR-DMX6-121618	Total/NA	Water	300.0	
550-115115-1 MSD	FC-CCR-DMX6-121618	Total/NA	Water	300.0	

Metals

Prep Batch: 164867

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115115-1	FC-CCR-DMX6-121618	Total/NA	Water	200.8	
550-115115-2	FC-CCR-MW7-121718	Total/NA	Water	200.8	
550-115115-3	FC-CCR-MW6-121618	Total/NA	Water	200.8	
550-115115-4	FC-CCR-MW16-121618	Total/NA	Water	200.8	
MB 550-164867/1-A	Method Blank	Total/NA	Water	200.8	
LCS 550-164867/2-A	Lab Control Sample	Total/NA	Water	200.8	
LCSD 550-164867/3-A	Lab Control Sample Dup	Total/NA	Water	200.8	
550-115115-1 MS	FC-CCR-DMX6-121618	Total/NA	Water	200.8	
550-115115-1 MSD	FC-CCR-DMX6-121618	Total/NA	Water	200.8	

Prep Batch: 164986

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115115-1	FC-CCR-DMX6-121618	Total/NA	Water	200.7	
550-115115-2	FC-CCR-MW7-121718	Total/NA	Water	200.7	
550-115115-3	FC-CCR-MW6-121618	Total/NA	Water	200.7	
550-115115-4	FC-CCR-MW16-121618	Total/NA	Water	200.7	
MB 550-164986/1-A	Method Blank	Total/NA	Water	200.7	
LCS 550-164986/2-A	Lab Control Sample	Total/NA	Water	200.7	
LCSD 550-164986/3-A	Lab Control Sample Dup	Total/NA	Water	200.7	
550-115115-1 MS	FC-CCR-DMX6-121618	Total/NA	Water	200.7	
550-115115-1 MSD	FC-CCR-DMX6-121618	Total/NA	Water	200.7	

Analysis Batch: 165571

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115115-1	FC-CCR-DMX6-121618	Total/NA	Water	200.7 Rev 4.4	164986
550-115115-2	FC-CCR-MW7-121718	Total/NA	Water	200.7 Rev 4.4	164986
550-115115-3	FC-CCR-MW6-121618	Total/NA	Water	200.7 Rev 4.4	164986
550-115115-4	FC-CCR-MW16-121618	Total/NA	Water	200.7 Rev 4.4	164986
MB 550-164986/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	164986
LCS 550-164986/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	164986
LCSD 550-164986/3-A	Lab Control Sample Dup	Total/NA	Water	200.7 Rev 4.4	164986
550-115115-1 MS	FC-CCR-DMX6-121618	Total/NA	Water	200.7 Rev 4.4	164986
550-115115-1 MSD	FC-CCR-DMX6-121618	Total/NA	Water	200.7 Rev 4.4	164986

Metals (Continued)

Analysis Batch: 165722

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115115-1	FC-CCR-DMX6-121618	Total/NA	Water	200.7 Rev 4.4	164986
550-115115-2	FC-CCR-MW7-121718	Total/NA	Water	200.7 Rev 4.4	164986
550-115115-3	FC-CCR-MW6-121618	Total/NA	Water	200.7 Rev 4.4	164986
550-115115-4	FC-CCR-MW16-121618	Total/NA	Water	200.7 Rev 4.4	164986
550-115115-4	FC-CCR-MW16-121618	Total/NA	Water	200.7 Rev 4.4	164986
MB 550-164986/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	164986
LCS 550-164986/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	164986
LCSD 550-164986/3-A	Lab Control Sample Dup	Total/NA	Water	200.7 Rev 4.4	164986
550-115115-1 MS	FC-CCR-DMX6-121618	Total/NA	Water	200.7 Rev 4.4	164986
550-115115-1 MSD	FC-CCR-DMX6-121618	Total/NA	Water	200.7 Rev 4.4	164986

Analysis Batch: 166694

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115115-1	FC-CCR-DMX6-121618	Total/NA	Water	200.8 LL	164867
550-115115-2	FC-CCR-MW7-121718	Total/NA	Water	200.8 LL	164867
550-115115-3	FC-CCR-MW6-121618	Total/NA	Water	200.8 LL	164867
550-115115-4	FC-CCR-MW16-121618	Total/NA	Water	200.8 LL	164867
MB 550-164867/1-A	Method Blank	Total/NA	Water	200.8 LL	164867
LCS 550-164867/2-A	Lab Control Sample	Total/NA	Water	200.8 LL	164867
LCSD 550-164867/3-A	Lab Control Sample Dup	Total/NA	Water	200.8 LL	164867
550-115115-1 MS	FC-CCR-DMX6-121618	Total/NA	Water	200.8 LL	164867
550-115115-1 MSD	FC-CCR-DMX6-121618	Total/NA	Water	200.8 LL	164867

Analysis Batch: 166913

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-115115-1	FC-CCR-DMX6-121618	Total/NA	Water	200.8 LL	164867
550-115115-2	FC-CCR-MW7-121718	Total/NA	Water	200.8 LL	164867
550-115115-3	FC-CCR-MW6-121618	Total/NA	Water	200.8 LL	164867
550-115115-4	FC-CCR-MW16-121618	Total/NA	Water	200.8 LL	164867
MB 550-164867/1-A	Method Blank	Total/NA	Water	200.8 LL	164867
LCS 550-164867/2-A	Lab Control Sample	Total/NA	Water	200.8 LL	164867
LCSD 550-164867/3-A	Lab Control Sample Dup	Total/NA	Water	200.8 LL	164867
550-115115-1 MS	FC-CCR-DMX6-121618	Total/NA	Water	200.8 LL	164867
550-115115-1 MSD	FC-CCR-DMX6-121618	Total/NA	Water	200.8 LL	164867

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115115-2
SDG: Cholla

Client Sample ID: FC-CCR-DMX6-121618

Lab Sample ID: 550-115115-1

Date Collected: 12/16/18 10:36

Matrix: Water

Date Received: 12/18/18 12:33

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165473	12/27/18 01:54	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 12:31	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		4	165722	12/29/18 02:56	SRA	TAL PHX
Total/NA	Prep	200.8			164867	12/19/18 11:06	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		20	166694	01/14/19 21:42	ARE	TAL PHX
Total/NA	Prep	200.8			164867	12/19/18 11:06	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		20	166913	01/16/19 23:01	ARE	TAL PHX

Client Sample ID: FC-CCR-MW7-121718

Lab Sample ID: 550-115115-2

Date Collected: 12/17/18 08:56

Matrix: Water

Date Received: 12/18/18 12:33

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/22/18 05:47	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 14:02	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165722	12/29/18 05:22	SRA	TAL PHX
Total/NA	Prep	200.8			164867	12/19/18 11:06	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		20	166694	01/14/19 21:57	ARE	TAL PHX
Total/NA	Prep	200.8			164867	12/19/18 11:06	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		20	166913	01/16/19 23:16	ARE	TAL PHX

Client Sample ID: FC-CCR-MW6-121618

Lab Sample ID: 550-115115-3

Date Collected: 12/16/18 11:49

Matrix: Water

Date Received: 12/18/18 12:33

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/22/18 06:24	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 14:08	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165722	12/29/18 05:34	SRA	TAL PHX
Total/NA	Prep	200.8			164867	12/19/18 11:06	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		20	166694	01/14/19 22:00	ARE	TAL PHX
Total/NA	Prep	200.8			164867	12/19/18 11:06	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		20	166913	01/16/19 23:18	ARE	TAL PHX

Lab Chronicle

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115115-2
SDG: Cholla

Client Sample ID: FC-CCR-MW16-121618
Date Collected: 12/16/18 08:54
Date Received: 12/18/18 12:33

Lab Sample ID: 550-115115-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2	165329	12/22/18 13:09	NEL	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165571	12/27/18 14:14	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		4	165722	12/29/18 05:40	SRA	TAL PHX
Total/NA	Prep	200.7			164986	12/20/18 10:34	SGO	TAL PHX
Total/NA	Analysis	200.7 Rev 4.4		1	165722	12/29/18 05:46	SRA	TAL PHX
Total/NA	Prep	200.8			164867	12/19/18 11:06	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		20	166694	01/14/19 22:02	ARE	TAL PHX
Total/NA	Prep	200.8			164867	12/19/18 11:06	SGO	TAL PHX
Total/NA	Analysis	200.8 LL		20	166913	01/16/19 23:21	ARE	TAL PHX

Laboratory References:

TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

Accreditation/Certification Summary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115115-2
SDG: Cholla

Laboratory: TestAmerica Phoenix

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Arizona	State Program	9	AZ0728	06-09-19

Method Summary

Client: Arizona Public Service Company
Project/Site: CCR

TestAmerica Job ID: 550-115115-2
SDG: Cholla

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL PHX
200.7 Rev 4.4	Metals (ICP)	40CFR136A	TAL PHX
200.8 LL	Metals (ICP/MS)	EPA	TAL PHX
200.7	Preparation, Total Metals	EPA	TAL PHX
200.8	Preparation, Total Metals	EPA	TAL PHX

Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.
EPA = US Environmental Protection Agency
MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

Laboratory References:

TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

TestAmerica Phoenix
4625 E Cotton Center Blvd
Suite 189
Phoenix, AZ 85040
phone 602.437.3340 fax 602.454.9303

Chain of Custody Record

115115

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Regulatory Program: CCR

TestAmerica Laboratories, Inc.

Client Contact	Doug Lavarnway	Doug Lavarnway	12/18/2018	COC No:
APS Cholla	928-587-0319	Lab Contact:	Carrier:	1 of 1 COCs
4801 Cholla Lake Road	Analysis Turnaround Time			Sampler:
Joseph City, Az 86032				For Lab Use Only:
(928) 587-0319 Phone	TAT if different from Below _____			Walk-in Client:
(xxx) xxx-xxxx FAX				Lab Sampling:
Project Name: CCR				Job / SDG No.:
Site: Cholla				
P O #				

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	EPA 200.7 (Li, Mg, SiO2)	200.8 (Sb, As, Ba, Cd, Cr, Co, Pb, Mo, Se, Tl)	EPA 300.0 (F)	Sample Specific Notes:
-1 FC-CCR-DMX6-121618	12/16/2018	1036	G	W	2	N	x	x	x	x	
-2 FC-CCR-MW7-121718	12/17/2018	856	G	W	2	N		x	x	x	
-3 FC-CCR-MW6-121618	12/16/2018	1149	G	W	2	N		x	x	x	
-4 FC-CCR-MW16-121618	12/16/2018	854	G	W	2	N		x	x	x	



Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

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

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments: Method 200.8 with collision cell

22/3.7°

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:	Cooler Temp. (°C): Obs'd: _____ Corr'd:	Therm ID No.: _____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Doug Lavarnway	APS	12/18/1233			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company: TA-PHX	Date/Time: 12/18/18 1233

COD

TestAmerica Phoenix
4625 E Cotton Center Blvd
Suite 189
Phoenix, AZ 85040
phone 602.437.3340 fax 602.454.9303

Chain of Custody Record

115115

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

1/22/2019

Regulatory Program: CCR

TestAmerica Laboratories, Inc.

Client Contact	Doug Lavarnway	Doug Lavarnway	12/18/2018	COC No:
APS Cholla	928-587-0319	Lab Contact:	Carrier:	1 of 1 COCs
4801 Cholla Lake Road	Analysis Turnaround Time			Sampler:
Joseph City, Az 86032				For Lab Use Only:
(928) 587-0319 Phone	TAT if different from Below _____			Walk-in Client:
(xxx) xxx-xxxx FAX				Lab Sampling:
Project Name: CCR				Job / SDG No.:
Site: Cholla				
P O #				

	Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	EPA 200.7 Rev 4.4 (B, Ca, Na, K, Mg)	EPA 300.0 (Cl, F, SO4)	SM 2540C (TDS)	SM 4500-HB (pH)	SM 2320B (HCO3)	Alkalinity	Carbonate as CaCO3	Bicarbonate as CaCO3	Sample Specific Notes:
-1	FC-CCR-DMX6-121618	12/16/2018	1036	G	W	2	N	x	x	x	x	x	x	x	x	x	
-2	FC-CCR-MW7-121718	12/17/2018	856	G	W	2	N		x	x	x	x	x	x	x	x	
-3	FC-CCR-MW6-121618	12/16/2018	1149	G	W	2	N		x	x	x	x	x	x	x	x	
-4	FC-CCR-MW16-121618	12/16/2018	854	G	W	2	N		x	x	x	x	x	x	x	x	

Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

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

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:

2.2/3.7=

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:	Cooler Temp. (°C): Obs'd: _____ Corr'd: 2.2	Therm ID No.: _____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Doug Lavarnway	APS	12/18 1133			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
				TA-PHX	12/18/18 12:33

Form No. CA-C-WI-002, Rev. 4.2, dated 04/02/2013

Login Sample Receipt Checklist

Client: Arizona Public Service Company

Job Number: 550-115115-2
SDG Number: Cholla

Login Number: 115115
List Number: 1
Creator: Maycock, Lisa

List Source: TestAmerica Phoenix

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

APPENDIX H

SITE CCR GROUNDWATER MONITORING SYSTEM NOTIFICATIONS

Arizona Public Service Company
CCR Program
Environmental Policy & Programs

PO Box 53999
Mail Station 9303
Phoenix, AZ 85072-3999

Telephone: 602-250-1000

February 13, 2019

CCR Program Documentation
Groundwater Monitoring Program – Notification of Initiation of Corrective Measures
FC_GW_CorMInitiate_008_20190213
FC_GW_CorMInitiate_009_20190213
FC_GW_CorMInitiate_011_20190213

Subject: GW – Notification of Initiation of Corrective Measures; Four Corners Power Plant

Pursuant to 40 C.F.R. Secs 257.95(g), APS is providing notice of the initiation of corrective measures at the following CCR units:

- LAI and North Toe Buttress/ Lined Decant Water Pond (Multi-Unit)
- Upper Retention Pond

As such, APS will commence evaluation of corrective measure alternatives.

If you have any questions about this or would like additional information, please consult the CCR information webpage located within APS.com or contact neal.brown@aps.com.

Per the September 8, 2015 letter to the Navajo Nation, this assessment monitoring notification should not be construed as a waiver of the covenant not to regulate contained in the site lease for the Four Corners Power Plant.

APPENDIX I

WOOD REPORT DEMONSTRATING THE NEED FOR CORRECTIVE MEASURES ASSESSMENT EXTENSION

Wood Environment & Infrastructure Solutions, Inc.
4600 E. Washington St, Suite 600
Phoenix, Arizona 85034
USA
T: 602-733-6000
www.woodplc.com

April 15, 2019
Wood Reference No: 1420182068
APS WA FCC08902

Arizona Public Service
400 N. 5th Street
Phoenix, Arizona 85004

Attn: Michele Robertson, Byron Conrad and Pam Norris

Re: DEMONSTRATION/CERTIFICATION OF NEED
FOR CORRECTIVE MEASURES ASSESSMENT EXTENSION
Four Corners Power Plant - Fruitland, New Mexico

Pursuant to 40 Code of Federal Regulations (CFR) Section (§) 257.96(a) of the Coal Combustion Residuals (CCR) Rule, Arizona Public Service Company (APS) is required to initiate an Assessment of Corrective Measures for the Four Corners Power Plant Upper Retention Sump (URS) and Multiunit 1 (comprised of the Lined Ash Impoundment and the Lined Decant Water Pond) within 90 days of finding that an Appendix IV constituent has been detected at a statistically significant level (SSL) exceeding an applicable Groundwater Protection Standard (GWPS). The assessment must be completed within 90 days unless there is a demonstrated need that additional time (up to 60 days) to complete the assessment is necessary. This letter documents this demonstration and includes a certification by a qualified professional engineer that the demonstration is accurate.

1. Demonstration

On October 15, 2018, fluoride was declared to be present at SSLs exceeding the GWPS in groundwater downgradient of the URS and cobalt and molybdenum were declared to be present at SSLs exceeding GWPSs in groundwater downgradient of Multiunit 1. Although the Assessment of Corrective Measures for both of these units has been initiated, additional time is required to complete the assessment on the basis of the following site-specific conditions and/or circumstances:

- An investigation of the nature and extent of impacts necessitated completion of a month-long monitoring well installation program;
- Iterative sampling rounds of both new and existing wells were needed to complete the investigation and the ability to sample was impacted by unfavorable weather conditions at the site;
- An existing and complex seepage collection system has been incorporated into the assessment for Multiunit 1 which requires time to adequately evaluate;
- Multiunit 1 is sited in a historical CCR disposal area and is underlain by a complex system of hydrogeologic units which makes evaluation of impacts and corrective measures difficult;
- Site aquifer testing is necessary to analyze potential remedial measures at the URS;
- Construction and use of a groundwater flow and contaminant transport model is required to evaluate potential remedial measures at the URS; and
- Coordination with plant personnel must occur to conceptually design corrective measures in the vicinity of existing infrastructure to ensure that realistic alternatives are considered.

2. Schedule

Given the demonstration and timelines presented herein, the schedule for completion of the Corrective Measures Assessment for the URS and Multiunit 1 is extended 60 days to June 14, 2019.

3. Certification

By means of this certification, I certify in accordance with 40 CFR §257.96(a) that the demonstration presented in this letter is accurate.



Daniel A. Kwiecinski
Printed Name of Registered Professional Engineer

13496	New Mexico	15 April 2019
Registration No.	Registration State	Date

APPENDIX J

WOOD SEMIANNUAL REPORT DOCUMENTING PROGRESS OF REMEDY SELECTION FOR MULTIUNIT 1 AND THE URS

Wood Environment & Infrastructure Solutions, Inc.
4600 E. Washington St, Suite 600
Phoenix, Arizona 85034
USA
T: 602-733-6000
www.woodplc.com

July 15, 2019
Wood Reference No: 1420182068
APS WA FCC08902

Arizona Public Service
400 N. 5th Street
Phoenix, Arizona 85004

Attn: Michele Robertson, Byron Conrad and Pam Norris

Re: SEMI-ANNUAL REPORT DOCUMENTING PROGRESS IN REMEDY SELECTION FOR MULTIUNIT 1 AND THE UPPER RETENTION SUMP
Four Corners Power Plant - Fruitland, New Mexico

Pursuant to 40 Code of Federal Regulations (CFR) Section (§) 257.97(a) of the Coal Combustion Residuals (CCR) Rule, Arizona Public Service Company (APS) is required to prepare a semi-annual report describing progress selecting a remedy for CCR units that have been identified as potentially impacting groundwater based on a statistical assessement of groundwater data collected at the Four Corners Power Plant located in Fruitland, New Mexico (the Site). This letter serves as the first semi-annual report prepared after initiating corrective measures at Multiunit 1 (comprised of the Lined Ash Impoundment and the Lined Decant Water Pond) and the Upper Retention Sump (URS) on January 14, 2019.

1. Summary of Activities Completed to Date

Following a demonstration of need for a corrective measures assessment extension, dated April 15, 2019, Wood Environment & Infrastructure Solutions, Inc. (Wood) finalized a report presenting an *Assessment of Corrective Measures for Multiunit 1 and the URS* on June 14, 2019. The assessment documents the development and evaluation of various corrective measures for the two CCR units including:

- Operation of an existing intercept trench system downgradient of Multiunit 1 to extract impacted groundwater prior to migration off-site;
- Future dewatering of Multiunit 1 with subsequent closure;
- Demolition of the URS and replacement with a new concrete tank (the Upper Retention Tank [URT]) in the footprint of the former URS to perform the previous function of this process unit;
- Installation and operation of new containment wells to intercept impacted groundwater downgradient of the URS; and
- Monitored natural attenuation of CCR constituents.

2. Future Planned Activities

As identified in the *Assessment of Corrective Measures for Multiunit 1 and the URS*, additional site characterization is necessary prior to selection and design of the Multiunit 1 and URS remedies. Currently planned activities include:

- *Further Assessment of Groundwater Elevations in the Disposal Area*. Additional supplementary site wells will be monitored to further evaluate groundwater elevations in the region north of the identified extent of cobalt impacts to ensure that assessment of trench effectiveness includes groundwater that can reasonably be attributed to Multiunit 1.
- *Evaluation of Constituent of Concern (COC) Exceedances at MW-87*. Continued sampling of monitoring well MW-87, when water is present, with supplemental analysis of general water quality parameters will be conducted to determine the source of COC exceedances at MW-87.
- *Assessment of Logistical Constraints for a Potential URS Groundwater Containment System*. Given the congested area around the former URS and proximity to a controlled-access region of the plant, investigation of constraints and stakeholder engagement with plant operations personnel will be conducted to identify suitable locations for potential new containment wells and routing of discharge piping to the URT or a sump that discharges to the URT.

The next semi-annual report documenting progress in remedy selection at the Site will be prepared no later than January 15, 2020.

Respectfully submitted,
Wood Environment & Infrastructure Solutions, Inc.



Natalie Chrisman Lazarr, PE
Senior Project Manager
natalie.chrisman@woodplc.com

Reviewed by:



Emily LoDolce, PE
Senior Engineer
emily.lodolce@woodplc.com