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MATERIALS LICENSE NUMBER SUA-1475
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On behalf of United Nuclear Corporation (UNC), Wood Environment & Infrastructure Solutions, Inc. (Wood) has prepared this Annual Review Report of the groundwater corrective action at UNC's Church Rock Mill and Tailings site near Gallup, New Mexico, pursuant to License Condition 30C. This report is for the 2019 operating year and represents the period from January 2019 through October 2019.

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Annual Performance Review Report
2019 Groundwater Corrective Action
Church Rock, New Mexico
United Nuclear Corporation

Wood Project No.: WDC80202.400.401
Date: March 2020

Annual Performance Review Report | 2019 Groundwater Corrective Action

Church Rock, New Mexico
Project WDC80202.400.401 | United Nuclear Corporation

Prepared for:

United Nuclear Corporation
Gallup, New Mexico

March 28, 2020

Annual Performance Review Report | 2019 Groundwater Corrective Action

Church Rock, New Mexico

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Prepared for:

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Prepared by:

Wood Environment & Infrastructure Solutions, Inc.

March 28, 2020

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List of Acronyms and Abbreviations

ACL	alternate concentration limit
ALARA	as low as reasonably achievable
ARARs	applicable or relevant and appropriate requirements
BTV	background threshold value
COPCs	constituents of potential concern
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
FS	feasibility study
ft/yr	feet per year
gpm	gallons per minute
GWPSs	groundwater protection standards (NRC Source Materials license)
HHRA	human health risk assessment
IC	institutional control
MCL	maximum contaminant level (federal primary)
mg/L	milligrams per liter
MDC	minimum detectable concentration
MNA	monitored natural attenuation
NA report	natural attenuation test report
NA test	natural attenuation test
NMED	New Mexico Environment Department
NNEPA	Navajo Nation Environmental Protection Agency
NRC	U.S. Nuclear Regulatory Commission
pCi/L	picocuries per liter
POC	point of compliance
POE	point of exposure
ROD	Record of Decision
SFS	Supplemental Feasibility Study
SWSFS	Site-Wide Supplemental Feasibility Study
SMCL	secondary maximum contaminant level (federal)
TDS	total dissolved solids
TTHMs	total trihalomethanes
TI	technical impracticability
UCL95	upper confidence limit of the mean at the 95% confidence level
UPL95	upper prediction limit at the 95% confidence level
U.S.	United States
µg/L	micrograms per liter

1 Introduction

On behalf of United Nuclear Corporation (UNC), Wood Environment & Infrastructure Solutions, Inc. (Wood) has prepared this annual performance review of the groundwater corrective action at UNC's Church Rock Mill and Tailings Site, located near Gallup, New Mexico, pursuant to United States Nuclear Regulatory Commission (U.S. NRC) Source Materials license 1475, Condition 30C. An annual corrective action report has been issued, by UNC, at the end of each operating year since 1989. This report includes the results of groundwater quality analyses and groundwater elevation monitoring for the first through fourth quarters of 2019.

This report focuses on both active remediation and the groundwater performance of the natural systems without active remediation (i.e., 'natural attenuation'). As indicated in the U.S. Environmental Protection Agency's (EPA's) First Five-Year Review Report (EPA, 1998), the EPA recognized that the corrective action pumping systems were at or nearing the limit of their effectiveness and recommended that Technical Impracticability (TI) Waivers, Alternate Concentration Limits (ACLs), and Monitored Natural Attenuation (MNA) be used to complete the corrective action program (EPA, 1988b). Subsequent presentations and reports prepared to document the geochemical processes in the Southwest Alluvium (Earth Tech, 2000d and 2002b; Chester Engineers, 2009a) and the Zone 1 hydrostratigraphic unit (Earth Tech, 2000c; Chester Engineers, 2009a) showed that the natural geochemical mechanisms in these areas are at least as effective as the active remediation systems in controlling the migration of constituents of concern. This annual report describes how these natural processes are performing in these areas, and updates active remediation efforts and investigations in Zone 3, comprising the pumping of extraction wells along the northern front of seepage impact.

1.1 Site Location

The Church Rock Site ("Site") is located approximately 10 miles northeast of Church Rock, in McKinley County, New Mexico (see Figure 1). Figure 2 is a Site map that shows the location of the decommissioned and temporarily idled extraction wells, the performance monitoring wells, the evaporation ponds, and the reclaimed tailings areas. Figure 2 also shows the Remedial Action Target Area for each hydrostratigraphic unit, where the impacts of tailings seepage were originally identified and corrective action was implemented (EPA, 1988a). Additional background information on Site facilities and activities is available in the previous annual reviews (Canonie Environmental Services Corp. [Canonie], 1989b, 1990, 1991, 1992, 1993 and 1995; Smith Technology Corporation, 1995 and 1996; Rust Environment and Infrastructure, 1997; Earth Tech, 1998, 1999, 2000e, 2002a and 2002c; USFilter, 2004; N.A. Water Systems, 2004, 2005, 2007a, and 2008a; Chester Engineers, 2009a, 2010a, 2011a, 2012b, 2013, 2014a, 2015a, 2016, 2017; Hatch Chester, 2018, and Hatch, 2019).

1.2 Chronology of Site Events

Table 1A provides a chronological summary of important Site events from June 1977, when UNC milling operations began, to December 2019.

1.3 Corrective Action Systems

The corrective action systems for tailings seepage remediation were installed and began operating during the summer and fall of 1989. These systems have been decommissioned or, in the case of the Southwest Alluvium, shut off pending further evaluation, and performance monitoring is ongoing. The Zone 1 system

was decommissioned in July 1999 in accordance with the letter from the NRC dated July 30, 1999 (NRC, 1999a).

1.3.1 Southwest Alluvium

1.3.1.1 Southwest Alluvium Corrective Action System During 2019 Reporting Year

The Southwest Alluvium corrective action pumping system remained idle in 2019. Attenuation via natural geochemical processes has been shown to be at least as effective as pumping.

The Southwest Alluvium system was temporarily shut off in January 2001 to facilitate implementation of the natural attenuation test (NA test). The NA test was discussed and approved during the November 14 and 15, 2000, meeting in Santa Fe, New Mexico, and documented in the November 15, 2000, letter from the EPA. As requested by the EPA (2004a; and during meetings in Santa Fe on February 26, 2004, and at Church Rock on May 5, 2005), UNC continues to acquire groundwater quality data from wells in the Southwest Alluvium to monitor the effectiveness of natural attenuation and compare its performance to that of previous remedial efforts. This annual report presents a continuing assessment of the effectiveness of natural attenuation in the Southwest Alluvium. Performance monitoring is ongoing and is summarized in Section 1.4.1. Sampling results are summarized in Section 1.4.3 and discussed in detail in Section 2.3.

1.3.1.2 Changes to Southwest Alluvium Corrective Action System During 2019 Reporting Year

There were no changes to the Southwest Alluvium corrective action systems in 2019. A discussion of historical changes to the systems is provided in Section 2.1.

1.3.2 Zone 3

1.3.2.1 Zone 3 Corrective Action System During 2019 Reporting Year

Starting in 2005, extraction well pumping in Zone 3 has been carried out under a revised pumping regime. UNC continually revises and improves upon the Zone 3 remedial system. The Zone 3 corrective action system during 2019 comprised extraction from wells RW-11, RW-16, RW-17, RW-A, NW-2 and NW-5. Extraction from well NW-2 was suspended on November 13, 2019, because the water level dropped below the pump intake and well recharge was insufficient to reliably operate the pumping system. Performance monitoring is ongoing and is summarized in Section 1.4.1. Sampling results are summarized in Section 1.4.3 and discussed in detail in Section 3.3.

1.3.2.2 Changes to Zone 3 Corrective Action System During 2019 Reporting Year

There was only one change to the Zone 3 corrective action systems in 2019: extraction from well NW-2 was suspended on November 13, 2019, because the water level dropped below the pump intake (see Section 3.1.4). A discussion of changes that occurred in prior years and 2019 is provided in Section 3.1.

The following conclusions from previous Zone 3 corrective action systems and investigations provide the basis for our understanding of Zone 3 hydrogeology and its interactions with corrective actions systems.

- The corrective action system began operation in 1989. The Zone 3 system was shut down in June 2000 for maintenance and repairs. Prior to the Zone 3 system being brought back on-line, the

agencies agreed that the existing system should be decommissioned (NRC, December 29, 2000 license amendment). This decision included a provision for UNC to submit a modified corrective action plan, an application for ACLs, or an alternative to the specific requirements of 10 CFR Part 40, Appendix A, if the license standards are not achievable. During 2006, UNC completed an extended pilot investigation (hydrofracture study) that indicated that the new pumping configuration had achieved nearly complete capture of the northward-advancing seepage-impacted water, while causing a notable improvement in the water quality within the northern tracking wells.

- Subsequent analyses indicated that the improvement of water quality in northern tracking wells was temporary and that there was a need for additional extraction wells to enhance groundwater capture. Extraction Well RW-A and the five NW-series wells (Appendix B; Figure B-1) were installed to intercept and recover seepage-impacted water from Zone 3 in the northern part of Section 36 from 2007 to 2009.
- Pumping in the northernmost part of Zone 3 has created a mixing zone of background and seepage-impacted water. Groundwater quality along the northern tracking wells has oscillated between degrading and improving trends; therefore, the mapped position of the seepage-impacted water is dynamic.
- An alkalinity injection pilot study between April 2011 and June 2012 used injection Well IW-A to enhance containment and to geochemically stabilize the seepage-influenced water (UNC's Remedial Design Report, Chester Engineers, 2010a). While alkalinity injection has been discontinued because both UNC and NRC believe it may lead to mobilization of uranium.
- Pumping in Zone 3 continues, albeit characterized by very low, and diminishing, well yields.

The revised Zone 3 pumping system has been declining in performance as anticipated by Appendix A of the ROD (EPA, 1988b), which states that "operational results may also demonstrate significant declines in pumping rates with time due to insufficient natural recharge of aquifers" and that "In the event that saturated thicknesses cease to support pumping, remedial activity would be discontinued or adjusted to appropriate levels." Declining pumping system performance has also been acknowledged in EPA Five-Year Review reports (e.g., EPA, 1998; EPA, 2008; EPA, 2013; EPA, 2018). All the Zone 3 extraction wells have reduced average yields that are below 0.2 gallons per minute (gpm) and the total volume pumped decreased by 16 percent from 2017 (619,073 gallons) to 2018 (519,948 gallons) and another 30% from 2018 to 2019 (365,784 gallons). Extraction wells having yields below the 1 gpm decommissioning criterion may be recommended for decommissioning in in a future license amendment request.

1.3.3 Zone 1

1.3.3.1 Zone 1 Corrective Action System During 2019 Reporting Year

The Zone 1 system was decommissioned in July 1999 in accordance with the letter from the NRC dated July 30, 1999 (NRC, 1999a). Performance monitoring is ongoing and is summarized in Section 1.4.1. The performance monitoring results are summarized in Section 1.4.3 and discussed in detail in Section 4.3.

1.3.3.2 Changes to Zone 1 Corrective Action System During 2019 Reporting Year

There were no changes to the Zone 1 corrective action systems in 2019.

1.4 Summary of Performance Monitoring and Supplemental Sampling

1.4.1 Performance Monitoring

The groundwater performance monitoring plan has been approved by the NRC and EPA and is described by the Corrective Action Plan (UNC, 1989a), Remedial Design Report (Canonie, 1989a) and Remedial Action Plan (UNC, 1989b). The program has been modified over time, as described in the annual reports (Canonie, 1989b, 1990, 1991, 1992, 1993 and 1995; Smith Technology, 1995 and 1996; Rust, 1997; Earth Tech, 1998, 1999, 2000e, 2002a, and 2002c; USFilter, 2004; N.A. Water Systems, 2004, 2005, 2007a, 2008a; Chester Engineers, 2009a, 2010a, 2011a, 2012b, 2013, 2014a, 2015a, 2016, 2017; Hatch Chester, 2018; and Hatch 2019), to adjust the monitoring requirements as the corrective action has progressed.

In accordance with the EPA's request in 1999, UNC developed a revised monitoring program that began with the second quarter 2000 sampling event. The revised program is documented in the letters dated January 13, 2000 (Earth Tech, 2000a), and April 26, 2000 (Earth Tech, 2000b). Details of the revised monitoring program for each hydrostratigraphic unit are provided in the performance-monitoring portion of the following sections and in the appendices.

UNC requested modifications to the performance monitoring program in a 2015 license amendment request to NRC (GE, 2015) and three subsequent communications that further amended, corrected, and resubmitted the request (GE, 2016b; GE, 2017; GE, 2018). UNC later withdrew the 2018 request (GE, 2019), pending action by NRC on another license amendment request related to the construction of a mine spoil repository on the tailings impoundments (see Section 1.5.1). UNC will reconsider requesting the license amendment related to performance monitoring as NRC action on the mine spoil repository amendment request proceeds. As previously reported, UNC has also determined that a few monitoring wells included in the current performance monitoring program do not meet low-flow sampling performance requirements, which limits the ability to collect representative samples at these locations. Monitoring wells that do not meet operating criteria are considered candidates for decommissioning, which may be recommended to NRC in a future license amendment request.

The quarterly field pH, groundwater elevations, and laboratory analytical data collected from the third quarter of 1989 through the fourth quarter of 2019 are tabulated in Appendices A (Southwest Alluvium), B (Zone 3), and C (Zone 1). These data are compared to the current NRC license standards (updated in 2015) and the revised EPA cleanup levels (or "revised EPA cleanup standards") that were proposed by UNC and approved by EPA for use in preparation of Part III of the SWSFS (EPA, 2015). These standards have been used in the previous three annual reports; their continued use in this report is intended to reflect the most recent thinking that is critical to distinguishing background water from seepage-impacted water with respect to the Site remedial alternative evaluations. The group of constituents that has NRC license standards is a subset of the group with EPA standards. A few of the EPA cleanup standards differ from the NRC license standards (e.g., beryllium has a 0.050 mg/l NRC standard and a 0.004 mg/l EPA standard in Zone 3), but most are the same. Results that exceed either of the standards are highlighted in the respective Appendix data tables.

Quarterly laboratory summary analytical data sheets for the 2019 operating year are included at the end of each appendix. UNC directly submits the following semi-annual reports to NRC (as a license requirement), which are copied to the other agencies: (1) groundwater, effluent and environmental monitoring report (including the full laboratory analytical reports and field parameter data), and (2) groundwater quality assurance report (including quarterly field data sheets as filled out by hand).

Laboratory results of arsenic and selenium concentrations reported during the last three quarters of 2019 varied in comparison to previous years. Historically reported arsenic and selenium analyses have represented specific oxidation states (or species, i.e., As[III] and Se[IV]) since the early-to-mid 1990s. During early 2019, NRC informed UNC that samples from certain site wells should be classified as 11(e)2 byproduct material and, as such, could only be analyzed in facilities that have the proper NRC licensing. Based on Site knowledge and recent analytical data, UNC selected and proposed seven well locations (515 A, 604, 614, 613, 708, 717, and EPA 14) as warranting the 11(e)2 byproduct material classification (NRC has not formally ruled on this proposal). Because the analytical laboratory (Energy Laboratories) location that is equipped to perform the arsenic and selenium speciation analyses is not licensed to handle 11(e)2 byproduct material, alternative analytical plans were implemented. For the April 2019 monitoring event, Energy Laboratories performed "total" arsenic and selenium analyses (i.e., including all oxidation states or species) for all of the samples and speciated arsenic and selenium analyses for all samples except those classified as 11(e)2 byproduct material. Energy Laboratories subcontracted Test America Laboratories to perform speciated analyses on those 11(e)2 samples with "total" results that exceeded NRC and/or EPA standards. For the third and fourth quarter monitoring events Energy Laboratories subcontracted Inter-Mountain Labs (third quarter, speciations performed on additional samples collected in early September) and Pace Analytical (fourth quarter) to perform the speciation analyses. As a cost-saving measure, UNC specified the analysis of "total" arsenic and selenium for all samples as a screening level test and performed speciation analyses only for those samples that exceeded NRC or EPA standards. The 2019 results shown in the Appendix tables A.1, B.1, and C.1 reflect the "total" concentrations for the April through October samples (the January results indicate "no data" because total analyses were not performed in January). All arsenic and selenium results (both total and speciated) are shown in a comparison table in Appendix D. UNC will continue to evaluate total arsenic and selenium concentrations and speciated concentrations, where warranted, during the 2020 monitoring events and reassess the analytical program in the 2020 Annual Review Report.

1.4.2 Supplemental Sampling

Supplemental sampling has been conducted as a result of various agency requests as in previous years. One additional monitoring location, NW-5 was sampled for the full parameter list for the first time in 2019. Supplemental sampling locations are discussed in Sections 2.3 and 3.3.

1.4.3 Summary of 2019 Performance Monitoring Results

1.4.3.1 Southwest Alluvium

The Southwest Alluvium NRC POC wells include GW-1, GW-2, GW-3, and EPA 28 in Section 3 and Wells 632, EPA 23, and 509D in Section 2. Wells GW-2 and GW-3 can no longer be safely monitored (as of October 2015), because of their proximity to the unstable edges of the Pipeline Arroyo canyon.

During 2019, there were no exceedances of NRC license standards at any Southwest Alluvium POC wells and no exceedances of any NRC license standards in seepage-impacted water within Section 2. Nickel was detected at concentrations that exceeded the NRC license standard in four samples from background well SBL-01. In addition, concentrations of manganese and sulfate in four samples from well SBL-01 exceeded the EPA cleanup levels of 2.1 mg/L and 5,815 mg/L, respectively. EPA cleanup standards, for constituents that are not regulated by NRC or for which the EPA cleanup standard is different from the NRC license standard (e.g., nickel), were exceeded at the following locations (the numbers of quarterly exceedances are shown in parentheses):

NRC POC Wells:

- Well 509 D – chloride (4) and manganese (3),
- Well 632 – manganese (4), and
- EPA 23 – manganese (4).

Non-POC Wells:

- Well 801 – manganese (4),
- Well 803 – manganese (4), and
- Well SBL-01 (background well) – manganese (4), sulfate (4), and nickel (4).

Background well SBL-01 (Appendix A; Figure A-1) is not a POC well and is situated cross-gradient with respect to the groundwater flow near SBL-01. The concentrations of nickel in all four quarterly samples exceed the NRC license standard of 0.078 mg/L but were all below the EPA cleanup standard of 0.2 mg/L. Chloride, manganese and sulfate are non-hazardous constituent not regulated by NRC. No hazardous constituents exceeded revised EPA cleanup standards outside the UNC property boundary in seepage impacted water.

With the exception of exceedances of the NRC license standard for uranium in samples from Well GW-3 in 2015, the groundwater quality at all POC wells has met the current license standards since January 2011. Historical exceedances of the current NRC standards at POC wells are infrequent and most occurred more than a decade ago.

1.4.3.2 Zone 3

Groundwater levels in Zone 3 continued to decline in 2019, indicating that the zone of anthropogenic saturation continues to diminish as the groundwater drains down the dip of the bedrock layers. Extraction well pumping since 2005 has locally accelerated the rate of water level decline in northern Zone 3 (e.g., in the vicinity of Well NBL-01, which has been effectively dry since February 2013). As in previous years, the declining water levels and reduced saturated thicknesses prevented sample collection at several Zone 3 monitoring wells during 2019 (e.g., samples could not be collected from Well NW-1 for laboratory analysis, nor was there enough volume to complete field parameter testing after May 2019).

The depiction of northern edge of the seepage-impact front for October 2019 has been adjusted from that shown in 2018 to encompass both Well NW-5 and Well NW-2 (now fully impacted) and continue to adjoin MW-6. NW-1 is no longer shown to be within the seepage-impacted area based on its water chemistry (due to a lack of available volume, NW-1 could not be sampled for laboratory analysis during 2019 or for field parameter analysis after May 2019). Seepage-impacted groundwater reached NW-2 during 2019 but is continuing to be retarded by pumping from Well NW-5 (to the degree pumping can be maintained). NW-2 could only be pumped for part of 2019 due to the declining saturated thickness not enough groundwater was available to operate the pump. UNC continues to evaluate the chemistry and water levels in the northern Zone 3 wells and may modify pumping rates to optimize the extraction system operations or cease operations.

The following constituents exceeded NRC license standards at one or more Zone 3 NRC POC wells (517, 613, 708, and 711) during the 2019 quarterly monitoring: beryllium, nickel, selenium (total, but not Se[IV]), uranium, vanadium, and thorium-230. NRC license standards for beryllium, nickel, selenium (total, but not Se[IV]), and uranium were also exceeded in seepage-impacted water at non-POC Well 717 and the license

standard for arsenic (total, but not As[III]) was exceeded in one sample from seepage impacted, non-POC Well EPA 13. Additionally, the NRC license standards for arsenic (both total and As[III]) and combined radium (i.e., the combined activities of radium-226 and radium-228) were exceeded in samples from northern Zone 3 Well NW-3, which is interpreted to monitor predominantly background water.

Revised EPA cleanup standards were exceeded, at various locations, for beryllium, total dissolved solids (TDS), sulfate, aluminum, cobalt, and manganese during 2019 (i.e., for those constituents that are not regulated by NRC or for which the EPA cleanup standard is lower than the NRC license standard [e.g., beryllium]). Exceedances are further described by parameter in Section 3.3.4.

1.4.3.3 Zone 1

The Zone 1 NRC POC wells include Wells 604 and 614 within Section 2 and Wells EPA 04, EPA 05, and EPA 07 in Section 1. During the 2019 quarterly monitoring, three constituents (nickel, selenium [total] and TTHMs) were detected in POC well samples at concentrations that exceeded NRC license standards (Appendix C; Table C.1). Nickel concentrations exceeded the NRC license standard (0.070 mg/L) in all four quarters in Well 604 samples (within Section 2) and in all four quarters in EPA 07 samples (outside Section 2). The January, July, and October 2019 TTHM concentrations from POC Well 614 (within Section 2) exceeded the NRC license standard (80 µg/L). The April, July, and October samples for selenium (total, but not Se[IV]) exceeded the NRC license standard (0.01 mg/L) in Wells 604, 614 and EPA 07. NRC license standards for TTHMs (January, July, October), nickel (all four quarters), and selenium [total] (April through October) were also exceeded at non-POC Well 515 A during 2019.

EPA cleanup standards, for constituents that are not regulated by NRC or for which the EPA cleanup standard is different from the NRC license standard (e.g., nickel and selenium), were exceeded at the following locations (the numbers of quarterly exceedances are shown in parentheses):

NRC POC Wells:

- Well 604 – cobalt (4), nickel (2), and selenium [total, but not Se(IV)] (2);
- Well 614 – chloride (4) and selenium [total, but not Se(IV)] (3); and
- Well EPA 07 – cobalt (4) and selenium [total, but not Se(IV)] (3).

Non-POC Well:

- Well 515 A – TDS (4), sulfate (4), chloride (4), and manganese (4), selenium but not Se(IV)] (3).

The cobalt and selenium (total) exceedances in Well EPA 07 were the only EPA standard exceedances outside of Section 2. Chloride, cobalt, and nickel concentrations in Well EPA 07 were similar to those reported in 2018 but have increased slightly. The 2019 selenium (total) concentrations detected in well EPA 07 were higher than the 2019 and 2018 Se(IV) concentrations, which were all non-detected.

1.5 Status of Regulatory Requests

1.5.1 Ongoing from Previous Years

UNC submitted to NRC a license amendment request (GE, 2015) and three subsequent communications that amended, corrected, and resubmitted the request (GE, 2016b; GE, 2017; GE, 2018) that intended to bring the license into conformance with recent advances that have been made with respect to the

corrective action programs in the targeted areas. For example, UNC proposed to delete a license requirement to install and sample additional wells in Zone 3 and the Southwest Alluvium because the work has already been completed (Well NBL-01 was constructed in Zone 3 in 2001 and Well SBL-01 was completed in the Southwest Alluvium in 2004). UNC also recommended that these wells be added to the quarterly sampling program (noting that NBL-01 cannot currently be sampled due to decreased water levels and sediment accumulation in the well). For the Southwest Alluvium, in addition to the changes related to Well SBL-01, the license amendment request recommended that the corrective action program for the Southwest Alluvium contained in the current license should be formally discontinued and that monitoring and compliance requirements put forth in Conditions 30.A & 30.B be reduced to include the five POC wells (with Wells GW-2 and GW-3 omitted from the monitoring program) and SBL-01. For Zone 1, the license amendment request recommended the removal of Well EPA 02 and POC Wells EPA 04, EPA 05, and EPA 07, all of which are located in Section 1. The license amendment request was supported by data from the previous sixteen years of post-shutdown monitoring, which indicated a gradual improvement in water from the Zone 1 Point-of-Compliance (POC) wells (GE, 2015).

UNC subsequently withdrew the 2018 request (GE, 2019), pending action by NRC on another license amendment request related to the construction of a mine spoil repository on the tailings impoundments. UNC will reconsider making the license amendment request related to performance monitoring as NRC action on the mine spoil repository amendment request proceeds.

As first reported in the 2015 Annual Report, UNC has determined that a few monitoring wells included in the performance monitoring program do not currently meet low-flow sampling performance requirements, which limits the ability to collect representative samples at these locations. Monitoring wells that do not meet operating criteria are considered candidates for decommissioning, which may be recommended to NRC in a future license amendment request.

A working draft of the Site-Wide Supplemental Feasibility Study (SWSFS) was submitted to EPA for comment on January 6, 2017. EPA originally directed UNC to prepare the SWSFS in 2006 (EPA, 2006); the SWSFS has been conducted as a three-stage process in keeping with the three structural components of EPA's FS process: Stage 1 – develop remedial action objectives (SWSFS Part I); Stage 2 – development and screening of alternatives (SWSFS Part II); and Stage 3 – detailed analysis of alternatives (SWSFS Part III) (EPA, 1988c). Each stage has been completed and approved before commencing with the next stage because each stage of evaluation builds upon the results and findings of its predecessor. EPA (2009) approved the SWSFS Part I (N.A. Water Systems, 2007b; 2008d; 2008e; 2008f). In July 2009, UNC submitted to EPA the revised Part II of the SWSFS (Chester Engineers, 2009b), which addresses the development and screening of remedial alternatives. Based upon a series of comments and responses (EPA, 2010; and Chester Engineers, 2010c), UNC submitted the Revised Site-Wide Supplemental Feasibility Study Parts I and II in April 2011 (Chester Engineers, 2011b). In October 2011, EPA considered Parts I and II to be complete and provided UNC with Notice to Proceed with development of the SWSFS Part III (EPA, 2011) subject to additional EPA comments (EPA, 2011; 2012).

Work on the third stage of the SWSFS (i.e., SWSFS Part III) was reinitiated in 2015 subsequent to the revision of Site groundwater standards. Those revisions came about through (1) the 2015 NRC license Amendment (NRC, 2015), which updated the Site NRC license standards (i.e., groundwater protection standards or GWPSs) on the basis of a background threshold value (BTV) statistical analysis process, and (2) EPA approval to use the UNC proposed cleanup levels, identified through an analogous BTV statistical analysis process, for the SWSFS (EPA, 2015; Chester Engineers, 2015b). UNC consulted with the agencies (e.g., see Chester Engineers, 2012a) regarding the most appropriate statistical methods to determine representative background water concentrations for the future long-term compliance monitoring

program (where BTVs are appropriate for "not-to-exceed" monitoring results) and for the SWSFS. These concentrations differ from the mean-based background values utilized in the risk assessment context. UPL95s (upper prediction limit at the 95 percent confidence level) were selected as an appropriate statistical measure of BTVs for comparison with compliance samples. UNC utilized an extensive, current, and robust data set of groundwater quality analytical results from July 1989 through October 2007, inclusive, to develop UPL95s (or alternate UPLs, as appropriate) for each COPC in each hydrostratigraphic unit. Unlike the UCL95s (upper confidence limit of the mean at the 95% confidence level) developed for risk assessment purposes (N.A. Water Systems, 2008f), UPL95s are numerically developed by incorporating a specific, future compliance-monitoring program, involving a specific number of future sampling events and compliance-monitoring wells.

NRC issued license amendment No. 52 (NRC, 2015) with the revised groundwater protection standards on April 9, 2015. UNC has identified a few typographical errors in the standards and had proposed corrections in a now withdrawn license amendment request (GE, 2015; GE, 2016b; GE, 2017; GE, 2018; GE, 2019). The revised groundwater protection standards (including the proposed corrections) have been used for data comparisons in this annual report. UNC will reconsider making the license amendment request to correct these standards as NRC action on the mine spoil repository amendment request proceeds.

A few of the EPA cleanup standards differ from the NRC license standards due to a slightly different comparison process and regulatory basis, including arsenic, beryllium, nickel, and selenium. The standard for uranium in the initial proposal to EPA was 0.3 mg/L, which is the same as the current NRC license standard. EPA and NMED concluded that they do not support the current standard for uranium in the Southwest Alluvium (0.3 mg/l) but, instead, support the BTV calculated for uranium based on the UPL95 statistical methodology (0.205 mg/l). UNC recommended instead that the EPA uranium standard be waived, because the source of uranium in both background and seepage-impacted water in the Southwest Alluvium was not tailings seepage, but mine water, permitted to contain uranium concentrations up to 2 mg/l, discharged to Pipeline Arroyo for 17 years. The proposed uranium standard is further discussed in Section 2.3.5. However, in this report (as in the 2015 and subsequent Annual Reports, and SWSFS Part III) a standard of 0.3 mg/L has been used for comparisons.

These agency actions to revise the background standards lessen one of the technical impediments (GE, 2009) to eventual Site closure which stated that "long-term monitoring data and basic geochemical considerations reveal some cleanup objectives to be unattainable." For most parameters, the establishment of background threshold values through statistical analysis will incorporate and account for the natural geochemical evolution of pre- or post-mining, pre-tailings (i.e., background) groundwater quality and distinguish it from the chemical characteristics of post-mining, post-tailings groundwater (i.e., water that is subject to the corrective action program).

1.5.2 Changes During Reporting Year

In 2019, UNC completed the permitting process to drill, construct, and operate three sentinel monitoring wells north of the Section 36 boundary on the Navajo Reservation (in Appendix B; Figure B-2), as requested by the Navajo Nation EPA (NNEPA, 2013). The installation of these sentinel monitoring wells was completed between December 2019 and January 2020 to support the adoptions of waivers, alternate standards or other administrative controls to close the corrective action program. The principal objectives are to evaluate model predictions of the movement of the three types of water (pre-mining [i.e., natural]), background [post-mining/pre-tailings], and seepage-impacted). Geologic and water quality data collected from these wells will be evaluated to confirm that the monitoring objectives have been met.

2 Southwest Alluvium

2.1 Corrective Action Summary

The Southwest Alluvium corrective action pumping system remained idle in 2019. Attenuation via natural geochemical processes has been shown to be at least as effective as pumping. There were no exceedances of current NRC license standards or revised EPA cleanup standards by a hazardous constituent in seepage-impacted water outside the UNC property boundary in 2019.

The Southwest Alluvium system was temporarily shut off in January 2001 to facilitate implementation of the NA test. The NA test was discussed and approved during the November 14 and 15, 2000, meeting in Santa Fe, New Mexico, and documented in the November 15, 2000, letter from the EPA. As requested by the EPA (2004a; and during meetings in Santa Fe on February 26, 2004, and at Church Rock on May 5, 2005), UNC continues to acquire groundwater quality data from wells in the Southwest Alluvium to monitor the effectiveness of natural attenuation and compare its performance to that of previous remedial efforts. In October 2015, UNC submitted (and subsequently corrected and resubmitted) a license amendment request (GE, 2015; GE, 2016b; GE, 2017; GE, 2018; GE, 2019) that sought to terminate the Southwest Alluvium corrective action program because the groundwater quality at all POC wells had remained at or within the standards set in the license for at least the previous nine quarters (through July 2015), with the exception of uranium concentrations in Well GW-3 (which does not provide representative samples, see Section 2.3.5). This annual report presents a continuing assessment of the effectiveness of natural attenuation in the Southwest Alluvium. UNC subsequently withdrew the 2018 request (GE, 2019), pending action by NRC on another license amendment (see Section 1.5.1) and will request termination of the Southwest Alluvium corrective action program in a future license amendment.

2.2 Mass of Chemical Constituents Removed

The mass of chemical constituents removed during active groundwater recovery operations was calculated for the period from November 1989 through January 2001. These calculations were presented in the previous annual reviews, and the final summary was presented in the 2001 Annual Review (Earth Tech, 2002a).

2.3 Performance Monitoring Evaluation

2.3.1 Water Level Evaluation

The current water level monitoring component of the Southwest Alluvium performance monitoring program is summarized in Table 1B and comprises quarterly monitoring of water levels in 16 wells (see Figures 2 and 3A). Well SBL-01, a cross-gradient background (i.e., not seepage-impacted) well installed in 2004 has also been monitored and sampled quarterly since October 2004. Installed at the request of EPA (November 2000), it is not a formal requirement of the performance monitoring program but is monitored for water levels and water quality. POC Wells GW-2 and GW-3 can no longer be safely monitored (as of October 2015), because of their proximity to the unstable edges of the Pipeline Arroyo canyon. Wells GW-2 and GW-3 were proposed to be omitted from the monitoring program in a now withdrawn license amendment request (see Section 1.5.1).

Groundwater is present in the Southwest Alluvium as a result of the infiltration of water historically discharged into the Pipeline Arroyo after having been pumped from the Quivira and NECR mines to facilitate their construction and operation. This water percolated into the alluvium and created temporary

saturation near the tailings impoundments, which has diminished gradually over time. The detailed history of infiltration of mine-dewatering groundwater, into the alluvium and the subcrop of Zone 3 and Zone 1, has been incorporated into the Site groundwater flow model (Chester Engineers, 2012c, 2014b). This temporary saturation caused by discharged mine-dewatering groundwater is the recognized Southwest Alluvium background water (EPA, 1988a; 1988b; 1998; 2008). The level of saturation has been declining since groundwater pumping in connection with historical mine operations ceased in 1986. As a result, the flanks of the alluvial valley and the northern property boundary alluvium have completely de-saturated and, by 2000, a 31 percent saturation loss had been observed further to the south (Earth Tech, 2000d). The saturated thickness calculated for each performance monitoring program well during the October 2019 monitoring event is provided in Table 3. During 2019, all well measurements have shown decreasing groundwater elevations (with small fluctuations), indicating that the groundwater flux continues to decline with the shrinking of the zone of saturation.

The Southwest Alluvium potentiometric surface map for the October 2019 monitoring event is shown in Figure 3A. This figure shows a local, eastward turn to the saturated alluvium, beneath the northwestern part of the South Cell, reflecting the presence of a relatively high area (bulge) in the bedrock surface between Wells 509 D and EPA 23. This bulge encompasses the area including the "Nickpoint" along Pipeline Arroyo. The Nickpoint (Figure 3A) has been referred to in earlier reports. It is a local rim-like bedrock high along the arroyo, below which the streamway becomes incised and continues downgradient as Pipeline Canyon.

Figure 3B shows a contour map of saturated thickness in the Southwest Alluvium based on the October 2019 monitoring event results. The distribution of the groundwater suggests the likelihood that the northern portion of the groundwater system, upgradient of the Nickpoint and including Well 509 D, may have become "detached" or ponded (i.e., lost hydraulic continuity) from the groundwater to the south. Such detachment may occur along the local high in the top of bedrock that causes the saturated alluvium to jog to the east near the Nickpoint (Figure 3B). The underlying data density is not sufficient to allow certainty on this issue. However, it is likely that this will eventually happen both to the north of the Nickpoint and in a large depression, along the top of bedrock, that is west of the South Cell and below the Nickpoint.

Figure 4 shows water levels over time in Southwest Alluvium wells, illustrating the overall long-term trend of decreasing levels as water continues to drain from the alluvium. Note that in 2007, the water level in EPA 23 (below the Nickpoint) became higher than the level in 509 D (above the Nickpoint). The slope (rate) of decline above the Nickpoint (509 D) in Figure 4 is greater than the rate of decline below the Nickpoint (EPA 23) prior to January 2007, but later slowed relative to EPA 23, such that the water level elevations are similar, and rates of decline are virtually identical. Similarly, since 2015, the water level in background Well SBL-01 has been higher than the level in Well 624 and since July 2018, the Well SBL-01 water level has been higher than the level in Well EPA 25. The water level in SBL-01 also exhibits a lower rate of decline than the other wells over time, possibly because of well construction or hydrogeologic differences.

Water levels in the vicinity of the pumping wells increased temporarily after they were turned off in January 2001 for the start of the NA test (see Figure 5). Water levels in the former pumping wells have since stabilized at elevations similar to those measured in nearby monitoring wells. A summary of operational data for the Southwest Alluvium extraction wells is provided in Table 4.

Southwest Alluvium groundwater flows to the southwest, along the Pipeline Arroyo. Based on calculations of the volume of background groundwater drainage through the valley in comparison to historical

pumping rates, the drainage had exceeded the total pumping volume throughout the corrective action period by 30 percent or more (Earth Tech, 2000d). Groundwater pumping did not fully contain seepage-impacted water; however, it is important to realize that hydraulic containment is not a necessary feature of the corrective action program in the Southwest Alluvium because of the strong geochemical attenuation that occurs naturally.

2.3.2 Water Quality Evaluation and Current Extent of Seepage-Impacted Water

The current water quality monitoring component of the Southwest Alluvium performance monitoring program is summarized in Table 1B and comprises quarterly monitoring of water quality in 14 wells. Well SBL-01, a hydraulically cross-gradient background (i.e., not seepage-impacted) well is not a formal requirement of the performance monitoring program, but it is also monitored for water quality. As described in Section 2.3.1, POC Wells GW-2 and GW-3 can no longer be safely monitored (as of October 2015), because of their proximity to the unstable edges of the Pipeline Arroyo canyon. Wells GW-2 and GW-3 were proposed to be omitted from the monitoring program in a now withdrawn license amendment request (see Section 1.5.1).

As indicated in previous annual reports, UNC has determined that monitoring Wells GW-3 and 632 (both are POCs in the Southwest Alluvium) do not meet performance criteria associated with low flow groundwater sampling methods, which limits the ability to collect representative samples. The alluvium also has very limited saturated thickness at Well GW-3, which may have contributed to elevated constituent concentrations (i.e., consistent with the hypothesis developed by NRC [1996], that dissolved salt concentrations increase as saturation levels decline and the aquifer system dries out). Monitoring wells that do not meet operating criteria are considered candidates for decommissioning, which may be recommended to NRC in a future license amendment request.

A summary of constituents detected in the Southwest Alluvium in the October 2019 monitoring event is provided in Table 2. Historical groundwater quality and groundwater elevation data through October 2019 are provided in Appendix A; Table A.1. Both tables also include the Southwest Alluvium NRC GWPSs and the revised Southwest Alluvium EPA cleanup levels to facilitate direct comparison with the groundwater data. These groundwater standards were revised through the development of updated BTVs by statistical analysis. NRC issued a license amendment to update Site GWPSs (NRC, 2015) and EPA approved use of the UNC proposed cleanup levels (EPA, 2015) for remedy alternative evaluation in the ongoing SWSFS. Appendix D; Table D.1 provides a comparison table of total and speciated arsenic and selenium results.

No hazardous constituents exceed current NRC license standards or revised EPA cleanup standards outside the UNC property boundary in seepage-impacted water sampled during 2019. Apart from the 12 uranium NRC license standard exceedances in samples collected from Well GW-3 between July 2012 and July 2015 (discussed more below), the groundwater quality at all POC wells has met the current license standards since January 2011. Concentrations of manganese exceeded the EPA cleanup level (2.1 mg/L) in monitoring wells 632, 801, 803, and EPA 23 located on the property.

The area currently containing seepage-impacted groundwater in the Southwest Alluvium is shown on Figure 6. As explained more fully below, common ion geochemistry in the delineated area has been changed by the neutralization of tailings seepage migrating through the alluvium. The area of seepage impact extends southwest along the western margins of the North, Central, and South Cells, and continues approximately 1,500 ft across the southeastern corner of adjacent Section 3 and approximately

190 ft into the north-central portion of adjacent Section 10. The total length of the area is approximately 6,600 ft.

Historically, only two constituents (sulfate and TDS) consistently exceeded their historical EPA standards in the Southwest Alluvium seepage-impacted groundwater outside the UNC property boundary in Sections 3 and 10. Sulfate and TDS also exceeded the historical EPA standards in the background water (Wells 627, EPA 28, and SBL 1). The majority of TDS is composed of sulfate; therefore, TDS concentrations mimic sulfate concentrations (Earth Tech, 2000d). In comparison to the revised EPA standards, there were no exceedances of TDS in any Southwest Alluvium wells during 2019 and sulfate exceedances occurred all four quarterly samples from background Well SBL-01 (Figure 7).

Historical sulfate concentrations through October 2019 are shown graphically in Figure 7. This figure shows that the long-term concentrations in most wells have remained approximately steady with the following exceptions: (1) the concentrations in Wells 801 and 509 D decreased in January 2000 and October 1999, respectively, and have since remained, with some recent variability, at relatively lower levels; and (2) the concentrations in Well GW-2 (no longer sampled beginning in October 2015 because the well is unsafe to access) have shown an overall increasing trend since the shutoff of pumping, although the increase appears to have moderated starting in July 2010 and is well below the revised EPA standard. The light-gray data points in the upper right part of this chart represent the sulfate measurements from background Well SBL-01 (post-mining/pre-tailings; i.e., background water quality). The 2018 and 2019 monitoring events in Well SBL-01 reflect that sulfate concentrations appear to have stabilized within a range of approximately 5,700 – 6,300 mg/L. In October 2019, as in all previous quarters, this well had the highest sulfate concentration of any well in the Southwest Alluvium, including the nearest, hydraulically upgradient Well 624 (2019 range 2,310 – 2,340 mg/L) which is impacted by seepage. As shown on Figure 7, the only exceedances of the revised EPA cleanup level for sulfate in 2019 were found in the four quarterly Well SBL-01 samples.

Where they occur, locally increasing trends in concentrations of common dissolved ions are unrelated to tailings seepage; they derive from the reaction of the anthropogenic recharge water with natural alluvium materials. Heterogeneous distribution of the soluble alluvium minerals is the most significant factor affecting the intra-well and inter-well variations in the concentrations of common dissolved ions. Increasing levels of common dissolved ions may mean that either (1) the diminishing saturation is being accompanied by increasing dissolved ion concentrations (consistent with the hypothesis developed by NRC, 1996), and/or (2) more of the alluvium minerals are being dissolved (also discussed by NRC, 1996). As shown by UNC's MINTEQ studies, the alluvium groundwater is generally at saturation (or in equilibrium) with respect to calcite, gypsum, and other soluble mineral salts.

Figure 8 is a bicarbonate isoconcentration map of the Southwest Alluvium during October 2019. As explained in earlier annual reports and in the first natural attenuation test report (NA report; Earth Tech, 2002b), bicarbonate concentration is the main attribute by which the presence and extent of seepage-impacts can be evaluated. The seepage-impacted area has near-neutral pH values as a result of the high capacity of the alluvium to neutralize the acidic tailings seepage. The neutralization capacity has also prevented the migration of metals from the former tailings impoundments. The neutralization capacity is strongly tied to relatively large amounts of calcite (CaCO3) in the alluvium that is available for buffering: Canonie (1987, Table 4.4) reported measured alluvium CaCO3 fractions of 2.58 percent in a sample collected during drilling of Well EPA 23; 0.77 to 0.28 percent near the Pipeline Arroyo Nickpoint; and 0.02 to 12.6 percent elsewhere.

The bicarbonate isoconcentration contours shown in Figure 8 illustrate the zone of seepage impact. Prior to the 2004 Annual Report, the seepage impact zone was based on assumptions of seepage migration rates and delineated by a line encompassing estimated bicarbonate concentrations exceeding 1,000 mg/L. It has since been recognized that there is a core of more significant impact (bicarbonate concentrations exceeding 2,000 mg/L) surrounded by progressively less seepage-impacted groundwater (approximated by the 1,000 mg/L contour).

The groundwater quality characteristics of the non-seepage-impacted (background) samples from Well SBL-01 differ in several important aspects from seepage-impacted water (refer to Figure 9 and Appendix A; Table A.1). Well SBL-01 is located hydraulically cross-gradient of the seepage-impacted water within background water (non-seepage-impacted water of post-mining/pre-tailings origin). Well 624 is the closest seepage-impacted well (500 ft) to Well SBL-01 (Figure 8). Although the following observations compare these two wells in particular, they apply equally well to most, if not all, of the seepage-impacted wells:

- Well SBL-01 contains a magnesium-sulfate (Mg-SO4) type water while Well 624 contains a calcium-sulfate (Ca-SO4) type. The presence of much higher magnesium concentrations in SBL-01 suggests the dissolution of magnesium salts in the alluvium (for example, epsomite or magnesite) during the earlier flushes of mine discharge water down Pipeline Arroyo.
- For comparison purposes, the range of calcium, magnesium, and bicarbonate (as HCO_3) detected (reported in mg/L) in 2019 is as follows:

Background Well SBL-01	**Well 624**
Calcium (480 – 506 mg/L)	Calcium (605-729 mg/L)
Magnesium (1,260 – 1,330 mg/L)	Magnesium (422 – 447 mg/L)
Bicarbonate (as HCO_3) (396 – 456 mg/L)	Bicarbonate (as HCO_3) (1,620 – 1,690 mg/L)

- The alkalinity (bicarbonate or HCO3) of Well SBL-01 water is much less than the seepage-impacted water in Well 624 samples. High bicarbonate concentrations are indicative of the neutralization of acid tailings liquids by dissolution of carbonate minerals. Chloride concentrations in Well SBL-01 are also lower than those indicative of seepage-impacted groundwater (see Appendix A and the discussion below in Section 2.3.4).
- Geochemical speciation calculations using EPA's MINTEQ numeric modeling code confirm that several aluminum-hydroxide (Al-OH) salts are oversaturated in Well SBL-01 water while they are not in Well 624 water. This suggests that the water farther downgradient than the seepage-impacted water may show signs of the dissolution of soluble salts associated with earlier flushes of the alluvium.

Well SBL-01 water and seepage-impacted water are alike in that both appear to be in approximate equilibrium with an assemblage of Ca-SO4 (as anhydrite or gypsum), magnesium-carbonate (Mg-CO3, as magnesite or dolomite), and calcium-carbonate (CaCO3, as calcite). MINTEQ simulations show that when acidic water (i.e., tailings liquid) is exposed to these mineral phases, there is a geochemical shift toward higher bicarbonate concentrations and lower sulfate concentrations (e.g., Well 624) than would occur in the absence of the acid (e.g., Well SBL-01). The result is a tendency to increase bicarbonate, decrease sulfate, and maintain constant calcium concentrations as the seepage-impact front migrates.

An interesting consequence of the migration of the seepage front should be that the ratio of sulfate to bicarbonate is at a minimum where the tailings seepage front meets and reacts with non-seepage-impacted areas in the alluvium. Sulfate concentrations are greater within the core of the seepage-

impacted areas because sulfate concentrations in the tailings liquids were up to two orders-of-magnitude greater than the amount that remains in the seepage-impacted water. A significant amount of gypsum had to precipitate in proximity to the concentrated tailings liquids to cause the reduction of sulfate concentrations to levels that are in equilibrium with gypsum. Out in front of the seepage-impacted water, the dissolution of the alluvium gypsum (or anhydrite) produced sulfate in the background water at levels above the historical standard (2,125 mg/L). The revised EPA cleanup level of 5,815 mg/L is exceeded only at Well SBL-01; all seepage-impacted wells have sulfate concentrations below this level.

These same conceptual geochemical models, for both the earlier evolution of the background water chemistry and the later, progressive evolution of seepage-impacted water chemistry, can be constructively applied to consideration of the groundwater chemistry data shown in Figure 9. Figure 9 shows the primary components of TDS in the Southwest Alluvium in the October 2019 monitoring event. The chart arrangement of the wells runs approximately from those located upgradient, on the left of the chart, to those downgradient on the right. Three background Wells (627, EPA 28, and SBL-01) show relatively elevated sulfate combined with high ratios of sulfate to bicarbonate. Former background Well EPA 25 shows a relatively lower ratio of these two parameters in conjunction with relatively elevated calcium. The long-term geochemistry in the vicinity of Well EPA 25 (Appendix A; Table A.1) suggests that fully seepage-impacted waters have been nearby, consistent with its hydraulically cross-gradient location with respect to the bicarbonate isoconcentration map in Figure 8. Figure 9 shows the highest contribution of sulfate to the TDS is in Well SBL-01 (this well historically has had higher sulfate concentrations than any other Southwest Alluvium well), a well which also shows the lowest contribution from bicarbonate (HCO3) and very low contributions from chloride ("Chl" on the figure) and calcium (Ca). These observations and analysis confirm that the current extent of seepage-impacted water has not reached Well SBL-01.

Neither the seepage-impacted water nor the background water that has not been impacted by seepage meets New Mexico water quality standards for TDS, but all samples are well below the revised EPA cleanup level of 10,376 mg/L (Table 2, Figure 10). In some respects, particularly regarding sulfate concentrations, the seepage-impacted water may be viewed as an improvement compared to the non-seepage-impacted (background) water. Groundwater quality within the Southwest Alluvium is further discussed in Section 2.3.5.

Unlike seepage-impacted waters in Zones 1 and 3, the pH of the Southwest Alluvium seepage-impacted water is nearly neutral. Consequently, there have been very few exceedances of the revised metals or radionuclides standards within the seepage-impacted water; recent exceptions include the following:

- Exceedance of the NRC license standard for uranium in 12 of the last 13 samples from Well GW-3 (not sampled since July 2015 because it cannot be safely accessed).
- Exceedances of the EPA cleanup standard for manganese (a non-hazardous constituent not regulated by NRC). During 2019, manganese exceedances were reported at five well locations within the property boundary (Table 2).
- An unusual (and slight) exceedance of the NRC license standard for Pb-210 in the April 2018 sample from Well 801. No Pb-210 exceedances were identified in any Southwest Alluvium samples during 2019

These exceedances are discussed further in Section 2.3.5.

Background water sampled at Well SBL-01 in 2019 had four exceedances of nickel (range 0.08 to 0.13 mg/L, higher than the NRC license standard of 0.078 mg/L but less than the revised EPA cleanup level of 0.2 mg/L) and manganese (range 3.52 - 3.89 mg/L, higher than the revised EPA cleanup level of 2.1 mg/L).

These metals exceedances are unrelated to seepage impact to the groundwater, because seepage-impacted water has not yet migrated to this location. Therefore, they should be viewed as a background condition, i.e., of post-mining/pre-tailings origin and age. The NRC's statistical evaluation of background water quality led to their recommendation that manganese, sulfate, and TDS should not be regulated Site constituents and they should not be used as bases for corrective action (NRC, 1996).

There were no arsenic or selenium results (total or speciated) that exceeded the NRC or EPA standards during 2019 at any Southwest Alluvium monitoring location (see Appendix A; Table A.1, and Appendix D, Table D.1). Arsenic (total) concentrations were detected in samples from both background and seepage-impacted water (range of detections 0.001 mg/L to 0.005 mg/L) with higher concentrations generally reported in April than in July or October (non-detected at many locations). Speciated arsenic (As III) was not detected in samples from any Southwest Alluvium monitoring locations (at reporting limits of 0.001 mg/L to 0.005 mg/L). Selenium (total) concentrations were detected below the NRC and EPA standard (0.070 mg/L) in four wells (509 D, 627, 801, and SBL-01) at a range of 0.002 to 0.020 mg/L). The highest total selenium concentrations were detected in background wells 627 and SBL-01. Speciated selenium (Se IV) was detected at the reporting limit (0.001 mg/L) in two samples (SBL-01 and EPA 23).

Two other constituents (chloroform and chloride) are present at concentrations that historically have exceeded standards primarily within the property boundary:

- Chloroform – In August 2006, the NRC modified the Site license to change the former chloroform standard of 1 µg/L to a TTHMs standard of 80 µg/L (NRC, 2006), which is equivalent to the EPA standard. Starting with the October 2006 sampling event, the laboratory has analyzed for TTHMs – all four component compounds (of which chloroform is one) are measured, and almost all Site groundwater samples (including the Southwest Alluvium) show that the TTHMs concentration equals the chloroform concentration (i.e., chloroform is the only TTHM compound present). In occasional discussion of "chloroform concentrations" in this report, the reader should bear in mind that the NRC/EPA standard (and laboratory analysis) of relevance is now for TTHMs and not solely for chloroform as was previously the case. Table 2 shows that during the October 2019 monitoring event, Southwest Alluvium TTHMs were detected at levels far below the NRC/EPA standard of 80 µg/L in the following wells: 632, 802, 808, and GW-1. The highest TTHMs concentration detected in any of the wells was 1.4 µg /L in Well 802. In 2019 there were no chloroform exceedances at any Southwest Alluvium sample locations (Appendix A; Table A.1).
- Chloride – Chloride is a non-hazardous constituent that is not regulated by NRC. In 2019, chloride concentrations exceeded the EPA cleanup standard (250 mg/L) only at Well 509 D, which is located near the Central Cell within Section 2. Chloride at Well 509 D has exhibited an overall stable trend since 1999 with fluctuations ranging from 278 to 462 mg/L (see Figure 12). There have been occasional slight exceedances of the EPA chloride standard outside Section 2 in Well GW-1. Chloride concentrations are discussed more in Section 2.3.5.

2.3.3 Rate of Seepage Migration

Earth Tech (2002b) analyzed concentration trends of chloride and bicarbonate to infer the rate of constituent migration. Seepage impacts were observed to have migrated beyond the Site property boundary by 1982, based primarily on the exceedances of historical standards in the seepage-impacted water for sulfate and TDS. However, bicarbonate and chloride have been determined to be the more effective indicators of seepage impact for reasons described in Section 2.3.2.

Groundwater velocity calculations have been made to update the estimate of the rate of downgradient seepage-impact transport. These estimates are Darcy seepage velocities equal to the product of the hydraulic conductivity and the hydraulic gradient, divided by the effective porosity. The resultant groundwater velocities are upper-bound estimates of constituent transport velocities because no retardation or attenuation factors are applied.

Table 5 shows Southwest Alluvium groundwater velocities determined based on groundwater elevation measurements made at Wells 805, 624, 627 and SBL-01 during the fourth 2019 groundwater monitoring event (i.e., October 2019). Upper and lower estimates of seepage velocity are based on a range of effective porosities adopted from Canonie (1989b) and Earth Tech (2002b). The average calculated velocities are based on a median porosity estimate of 0.31 and a mean hydraulic conductivity value of 2.5 x 10-3 cm/sec (replacing the former value of 2 x 10-3 cm/sec), which was determined to be an appropriate value based on groundwater flow model calibration for the Southwest Alluvium (Chester Engineers, 2012c, 2014b).

The average groundwater velocity from Well 624 to Well SBL-01 for October 2014 was 8 ft/yr, for October 2013 was 19 ft/yr, and for October 2012 was 11 ft/yr. With the exception of the increased velocity in 2013, the velocity has consistently decreased in the prior four years, which resulted from declining water levels and horizontal hydraulic gradients between this well pair. The water level in SBL-01 has a lower rate of decline than Well 624 over time. In 2015, the groundwater elevation difference became negligible between these wells and likely reversed, resulting in a higher elevation at SBL-01 compared to Well 624 (note the groundwater flow direction at SBL-01 is north-northwest approximately parallel with the flow direction at Well 0624). Groundwater at one of these wells would not impact the water quality at the other well. Additionally, the Well SBL-01 water level elevation has been higher than the level in Well EPA 25 since July 2018 and continues to be higher through October 2019.

Table 5 indicates that the calculated average velocity for well pair 805 and 624 for October 2019 is slightly higher than the 2014 through 2017 calculations and the same as the 2018 average velocity (59 ft/year in October 2018 and 2019; 57 to 58 ft/yr in previous years) and the calculated average velocity for well pair 805 and 627 in October 2019 (68 ft/yr) is consistent with those calculated for previous years.

Now that the piezometric elevations in SBL-01 and points east are depicted as being higher than in Well 624 (in Figure 3A), Well SBL-01 is no longer downgradient of the "nose" of the plume. Instead, hydraulic gradients are to the west-southwest and the "nose" of the 1,000 mg/L bicarbonate isoconcentration line is to the north of SBL-01, as depicted on Figure 8. The saturated thickness map in figure 3B is also consistent with this interpretation, because the greater saturated thickness to the north of SBL-01 implies that the mass flux would be greater in the area north of SBL-01.

2.3.4 Continuing Assessment of Southwest Alluvium Natural Attenuation and Earlier Technical Impracticability Waiver Request

UNC conducted a scheduled NA test from February 2001 to July 2002 to determine whether shutting off the Southwest Alluvium extraction wells would adversely affect water quality. The Southwest Alluvium extraction wells were shut off in January 2001 for the duration of the test. The NA report was submitted to the EPA, NMED, and NRC on November 4, 2002 (Earth Tech, 2002b). The NA report concluded that turning off the extraction wells does not have an adverse effect on water quality and that the natural system is as effective as, or more effective than, pumping for controlling the migration of the constituents of concern. EPA has not reached the same conclusion based upon the Second Five-Year Review Report

(EPA, 2003), subsequent Five-Year Review Reports (EPA, 2008, 2013, 2018) and further comments on the NA report (EPA, 2004a); therefore, additional monitoring is being performed.

The Technical Impracticability (TI) evaluation in the NA report concluded that natural conditions maintain sulfate and TDS concentrations at non-seepage-impacted background concentrations, which were nonetheless greater than previous EPA cleanup standards. However, because the revised EPA cleanup standards (issued in 2015) better account for background geochemistry, the conclusion has been revisited. When compared to the revised EPA cleanup levels, all TDS and sulfate concentrations, with the exception of sulfate in background Well SBL-01, are below the standards. Additional discussion of the TI evaluation is included in previous annual reports.

2.3.5 Reassessment of the Performance of the Natural System

The NA report (Earth Tech, 2002b) used nonparametric trend analysis to determine whether increases in contaminant concentrations occurred during the NA test and whether the changes were significant. Upward concentration trends were identified for bicarbonate, chloride, and TDS, although bicarbonate was evaluated as an indicator parameter only, not as a constituent of concern. These increases were attributed to the elimination of the partial capture provided by the extraction wells. No change in trend was observed for the sulfate concentrations because these are naturally equilibrated with gypsum. However, subsequent to the submittal of this report in 2002, Wells GW-2 and GW-1 had shown increasing sulfate trends; such increasing major ion concentrations reflect the influence of declining water levels and/or increased dissolution of the alluvium materials (NRC, 1996). The NA report (Earth Tech, 2002b) also concluded that there was no change in trend for manganese, chloroform, or uranium. It was concluded from these analyses that, although seepage-impacted water continues to migrate as shown by upward trends in bicarbonate, the migration of metals and radionuclides is arrested by attenuation processes (i.e., adsorption and precipitation). Continued groundwater quality monitoring through October 2019 supports this conclusion for the vast majority of analytes in virtually all monitoring wells.

Table 6 shows the predicted performance of natural attenuation in the Southwest Alluvium. In summary, sulfate and TDS concentrations in seepage-impacted water are expected to meet the revised EPA cleanup standards that take into account the gypsum equilibrium in background groundwater. Entries in Table 6 include evaluation of background water quality in Well SBL-01, as well as our understanding of the geochemical systems associated with both background water and seepage-impacted water. Manganese is expected to meet the revised (lower) EPA standard in seepage-impacted water outside Section 2 but exceed the EPA standard in both seepage-impacted wells within Section 2 and background Well SBL-01 (outside Section 2, in Section 10). Metals and radionuclides in seepage-impacted water are expected to meet their respective standards through attenuation by neutralization and adsorption. Previously, there was an unusual exceedance of the Pb-210 NRC license standard in the April 2018 sample from Well 801. However, Pb-210 was not detected in the four samples collected in 2019. Chloride concentrations (which are not regulated by NRC) in seepage-impacted water outside Section 2 meet the standard (with three minor exceptions at Well GW-1 between 2015 and 2018) but are expected to continue to exceed the EPA cleanup standard, particularly at upgradient Well 509 D, within Section 2. The individual indicator parameters and constituents of concern are discussed below.

2.3.5.1 Calcium and Bicarbonate

Calcium and bicarbonate are non-hazardous constituents and indicator parameters that are not regulated by NRC or EPA. Figure 13 illustrates the long-term stability of calcium and bicarbonate concentrations at Wells 627 and EPA 28, which have been considered examples of background wells that have not been

impacted by tailings seepage, as determined based on their bicarbonate concentrations below 1,000 mg/L. The bicarbonate concentration in Well EPA 28 decreased "step-wise" from approximately 800 mg/L to approximately 400 mg/L near the end of 2015 and has re-stabilized. These results suggest that although the bicarbonate plume may have been approaching EPA 28, bicarbonate concentrations did not rise to levels indicative of seepage-impact under the Site conceptual model. Subsequently, in the 2014 to 2015 timeframe, the bicarbonate band shifted away from EPA 28. Calcium concentrations in these two wells have been essentially the same through time. Figure 13 shows that during the onset of seepage impact in Well 624 (indicated by the increasing bicarbonate), the calcium concentration increased by approximately 100 mg/L and then re-equilibrated within a range of approximately 600 to 700 mg/L. Under changed groundwater quality flux, calcium concentrations remain fixed in the presence of calcite and gypsum by the Phase Rule; the long-term consistency of calcium concentrations in the Southwest Alluvium attests to the established equilibrium between the groundwater and these minerals. In general, calcium concentrations do not vary appreciably anywhere in the groundwater flow system (see Figures 9 and 14).

Figure 15 shows the bicarbonate concentrations over the same period. Bicarbonate is a non-hazardous constituent that serves as the primary indicator of seepage impact in the Southwest Alluvium. Wells EPA 25 and 509 D previously showed post-shutoff uptrends in bicarbonate. Bicarbonate concentrations in 509 D have stabilized since 2011. The other wells have, at different times, achieved post-shutoff stability. These observations indicate that neutralization and geochemical attenuation have been occurring naturally, and that alluvial mineral salts dissolve into the alluvium groundwater. This suggests that most of the system has largely attained a new steady-state with respect to bicarbonate following the termination of alluvial groundwater extraction.

2.3.5.2 Sulfate and TDS

Sulfate and TDS are non-hazardous constituents that are not regulated by NRC. They do not have federal drinking water MCLs; they do have SMCLs. As shown on Figure 9 (and consistent with Zone 1 and Zone 3), most of the TDS is comprised of sulfate. The revised EPA cleanup standards (5,815 mg/L for sulfate and 10,376 mg/L for TDS), which account for background geochemistry, eliminate most of the Site's historical sulfate and TDS exceedances.

Figure 16 shows sulfate concentrations from 1999 through October 2019 and Figure 17 presents TDS concentrations over the same period. Sulfate concentrations exceed the revised EPA cleanup standards (5,815mg/L) in the Southwest Alluvium only in non-seepage-impacted Well SBL-01. Sulfate concentrations in well SBL-01 ranged from 5,990 – 6,210 mg/L for the four 2019 sampling events and have shown a slightly upward trend over time with some variable fluctuations. TDS concentrations do not exceed the revised EPA cleanup standard of 10,376 mg/L in any well in the Southwest Alluvium. Concentrations of sulfate and TDS are typically lower within seepage-impacted waters than within non-seepage-impacted Well SBL-01, and they are not expected to rise above the values measured in SBL-01. The sulfate and TDS concentrations in all wells have remained fairly consistent since 1989 to present, except a slight increase of sulfate concentrations in background well SBL-01.

2.3.5.3 Chloride

The EPA cleanup standard (250 mg/L) for chloride derives from the New Mexico Water Quality Act, which is also the federal SMCL (this constituent does not have a federal primary MCL). Figure 12 presents chloride concentrations from 1999 through October 2019. Well 509 D is the only location where chloride concentrations have persistently exceeded the standard. In 2019, all four quarterly samples in well 509D

had chloride concentrations which exceed 250 mg/L (range 325 – 343 mg/L). Less common, and typically minor, exceedances have occurred in the past at Wells 632, 801, 802, GW-1, and GW-2.

Figure 12 shows that during the 18 months after the pumping shutoff, there were small Site-wide increases in chloride, after which concentrations returned to their pre-shutoff levels. The small increases may have been (at least partially) an artifact of the more frequent, monthly water quality measurements that were made for the 18 months following shutoff (after which the frequency returned to quarterly monitoring). Pumping had no effect on chloride concentrations with the apparent exception of Well GW-1, where post-shutoff increases stabilized in January 2004 at concentrations that occasionally show very small exceedances.

2.3.5.4 Manganese

Manganese is a non-hazardous constituent in water that is not regulated by NRC. It does not have a federal drinking water MCL; it does have an SMCL. The revised EPA cleanup level (2.1 mg/L) is lower than the historical EPA standard (2.6 mg/L) which was cited as background water quality in the ROD (EPA, 1988b).

Figure 11 presents manganese concentrations from 1999 through October 2019. Manganese is the only metal that consistently exceeds its revised EPA cleanup standard in seepage-impacted areas; however, there are no exceedances in seepage-impacted water outside Section 2. Exceedances occurred at five seepage-impacted wells: 801, 803, 632, EPA 23, and 509 D during 2019. Concentrations at Well 801 showed an increasing trend since a recent low in January 2012 (3.62 mg/L) to a peak in July 2014 (7.00 mg/L) but have since fluctuated and remain lower than concentrations observed prior to shutdown. Concentrations at Well 803 have fluctuated within a range of 2.01 to 3.55 mg/L, since 2012. The concentration trends have been relatively flat at Wells EPA 23, 632, and 509 D since 2000. Well 509 D is an upgradient well that was not hydraulically influenced by the former downgradient extraction well pumping, and the manganese concentration changes are probably unrelated to previous pumping (the changes are slight and concentrations appear to be stable between ~2 to ~4 mg/L). Wells EPA 23, 801, 632 and 803 had manganese exceedances in samples from all four events in 2019. Manganese also exceeded the standard in background Well SBL-01 in all four 2019 samples. Monitoring well 802, located in the center of the seepage-impacted area, continued to show low manganese concentrations (range 1.04 – 1.47 mg/L) during October 2019 that were below the standard.

Manganese is a common accessory element, and its concentrations in water are tied to Eh-pH conditions rather than any association with the tailings seepage. It is expected that manganese concentrations will continue to be below the standard in most of the seepage-impacted wells outside Section 2 due to natural redox conditions and/or saturation with respect to rhodochrosite if bicarbonate concentrations are high enough; however, exceedances are expected to continue at Well EPA 23 and Well 509 D (both of these are POC wells located significant distances upgradient of the Section 2 property boundary), and Well 801 located near the southern edge of the saturated alluvium in the southwest part of Section 2. Based on long-term trends, slight exceedances may continue at Well 632 (also a POC well) and at Wells 803, EPA 23 and sporadically in 808. In addition, manganese is expected to continue to exceed the standard in the cross-gradient background Well SBL-01.

2.3.5.5 Uranium

The statistical analysis included in the NA report (Earth Tech, 2002b) determined that there was not a significant increase in trend for uranium; however, the graphs of uranium concentration in several wells

indicated a possible increase prior to, and during, the NA test. For this reason, UNC has continued to reassess the uranium trends as part of the Site annual reporting. GE has evaluated the regulatory significance of the occurrence and distribution of dissolved uranium in the Southwest Alluvium. That report (GE, 2006) was prepared to assist EPA in deliberations about applying the current MCL for uranium (0.03 mg/L) as a formal cleanup criterion in the Southwest Alluvium. Figures 18 through 34 (discussed below) show that uranium concentrations exceeding 0.03 mg/L have been reported for both seepage-impacted and background wells; currently, uranium concentrations in the three background wells (Wells SBL-01, 627 and EPA 28) are below 0.03 mg/L. The NRC standard for uranium is 0.3 mg/L; based upon the Site history and distribution of uranium in background and seepage-impacted water. This has been considered the most supportable uranium standard for this Site (GE, 2006); there was no proposed change in the 2012 license amendment request for revised groundwater protection standards based on updated background concentrations (BTVs) (UNC, 2012), and no change to the standard in the license amendment (NRC, 2015).

EPA and NMED provided comments on an NRC draft EA related to UNC's 2012 license amendment request. EPA and NMED concluded that they do not support the current license standard for uranium in the Southwest Alluvium (0.3 mg/l) but, instead, support the BTV calculated for uranium based on the UPL95 statistical methodology (0.205 mg/l). The UPL95-based BTV is inappropriate for the following reasons:

- The source of uranium in both background and seepage-impacted water in the Southwest Alluvium is not tailings seepage, but mine water, permitted in the case of the NECR mine to contain uranium concentrations up to 2 mg/l, discharged to Pipeline Arroyo from both the NECR and Quivira mines for 17 years. Mine dewatering operations discharged approximately 3,000 gpm of groundwater pumped from the mine permit areas within the Morrison Formation to Pipeline Arroyo from 1969 to 1986. A portion of the groundwater discharged to Pipeline Arroyo infiltrated into the Southwest Alluvium and uranium adsorbed or precipitated within the alluvial sediments and has naturally attenuated to concentrations far below the discharge permit limit of 2 mg/L.
- Uranium concentrations in the Southwest Alluvium attenuate via adsorption and/or precipitation such that background uranium concentrations decrease with increasing distances downstream and away from the arroyo centerline. This geochemical evolution of background (post-mining/pre-tailings) water causes the background concentration for uranium to be spatially and temporally dependent. Put another way, the statistical analysis of uranium background does not distinguish the spatial and temporal variance, and instead, calculates a biased value across all sample locations and times because most background samples were from downgradient locations where background uranium concentrations are biased low.
- The concentration of dissolved uranium in seepage-impacted water is often a function of the bicarbonate concentration, and uranium concentrations have been empirically found to lie within the same concentration range as the background (post-mining/pre-tailings) water. For example, the maximum Southwest Alluvium background uranium concentration used in the calculation of Site background statistics (N.A. Water Systems, 2008b) was 0.367 mg/l, which exceeds the current NRC license standard. The net result is that uranium concentrations in seepage-impacted water may attain levels that are equivalent to the background water quality but not typically greater.
- Historically, there have been only occasional exceedances of the NRC license standard (0.3 mg/L) in the current Southwest Alluvium performance monitoring wells, most of which occurred at Well GW-3, and several of which occurred in Well 509 D (see Appendix A; Table A.1).
- A comprehensive review of historical uranium concentrations demonstrates that most of the seepage-impacted wells have shown overall stable to decreasing trends since the Southwest Alluvium

extraction system was shut off in January 2001. The EPA (2013) acknowledged that "With the exception of POC Wells GW-3 and 509D, and the very slight increasing trend in non-POC Well EPA 25; uranium concentrations trends over the duration of monitoring have either stabilized or shown decreasing levels since the pumps were turned off." Uranium concentrations in samples from GW-3 continued to increase through its last sampling in July 2015 (discussion in following bullet), but uranium concentrations at Wells 509D and EPA 25 appear to have stabilized and are below the NRC license standard.

- There is only one monitoring location outside Section 2 (GW-3, just over the Section 2 boundary) where previous uranium concentrations have exceeded the NRC license standard (0.3 mg/l) and the BTV (0.205 mg/l) since the extraction wells were shut down. Uranium concentrations at this location are not representative of general conditions in the Southwest Alluvium because the water level is very low (beneath the 2-ft minimum specified in the sampling procedure) such that the well no longer provides representative samples. The BTV does not fully take into account differences due to well construction and effects of decreasing saturated thickness. For example, as the saturated thickness declines (as in well GW-3), the well may become isolated or hydraulically disconnected from the Southwest Alluvial flow system; groundwater under these conditions is not representative of typical groundwater quality because it has greater opportunity to geochemically evolve and reach local equilibrium with the formation. This is further supported by the fact that there are no Southwest Alluvium monitoring wells between GW-3 and the tailings impoundment that have uranium concentrations exceeding the NRC license standard or having increasing trends.

The background water exhibits the same overall range in uranium concentrations as in the seepage-impacted water, but the timing and location of a particular uranium concentration depends more upon its particular flow path than on its origin as either post-mining/pre-tailings water (i.e. background) or tailings seepage.

Consequently, UNC has recommended that the uranium standard in the Southwest Alluvium be waived (Chester Engineers, 2015b) and there is no reference to the EPA cleanup level indicated on Table 2 or the historical data table in Appendix A; Table A.2.

Graphs of uranium concentrations in Southwest Alluvium water-quality performance monitoring locations (including SBL-01), through October 2019, are included as multi-well plots in Figures 18 and 19. Figure 18 shows only the seven POC wells; Figure 19 shows other selected wells, including background wells. Graphs of uranium concentrations are shown separately for each well in Figures 20 through 34:

- Well 509 D (Figure 20): The uranium concentration in Well 509 D, which is located upgradient of the South Cell and the other Southwest Alluvium wells, increased for one full year prior to the NA test starting in October 1999 (pumps were shut off in January 2001). Relatively large fluctuations have been characteristic since shutoff and during earlier periods. The concentration trend had been overall stable (i.e., approximately horizontal on the chart), at the higher end of the historical range, from July 2000 through October 2008, when an increasing trend started. However, since 2014 the concentration trend has stabilized. Well 509 D is located outside the zone of influence of the former pumping wells; it is not a good indicator of whether there is a benefit to pumping. Furthermore, based on the saturated thickness map (Figure 3B), Well 509D appears to have limited connection to the Southwest Alluvium flow system; this relative isolation may be a reason for differing geochemical responses than those observed downgradient.
- Well 801 (Figure 21): The uranium concentration in Well 801 increased to its maximum just prior to shutdown and decreased through most of the NA test. The concentrations decreased and stabilized, approaching the long-term average concentration that had been extant during pumping. The 800-

series wells are also closest to the tailings impoundment, and as such, would be expected to reveal any anomalous uranium concentrations that originate from the tailings impoundment seepage. No anomalies are present which suggests that the tailings seepage is not the source of uranium in the Southwest Alluvium.

- Well 802 (Figure 22): Well 802 was a pumping well that was shut down on January 8, 2001. Subsequent concentrations increased through September 2001, were stable through October 2003, then decreased overall and have been stable since 2008.
- Well 803 (Figure 23): The uranium concentration in Well 803 spiked in the year 2000, more than one year before the NA test. Only one of the samples collected since shutdown showed a higher uranium concentration than the two relatively high concentrations that were measured during 2000, before the shutdown. Post-shutoff concentrations increased through July 2002 to a similar value to those measured pre-shutoff during May and July 2000. Since July 2002, the trend has been decreasing and concentrations are consistent with the historical range (also see Appendix A; Table A.1). This is an example showing that although heterogeneous uranium-bearing waters may pass through the system, they will tend to approach a stable, average concentration whether or not the pumps are running.
- Well GW-1 (Figure 24): The uranium concentrations in Well GW-1 began to increase in 1999, well before the NA test, and therefore cannot be attributed to the cessation of pumping. Post-shutoff concentrations continued to increase at an accelerated rate through July 2002 and then decreased through January 2004, at which time they stabilized. During the latter half of 2019, the uranium concentrations increased slightly, but remained within the historical range. Figure 24 shows that uranium and bicarbonate concentrations have had over time a history of covariance at GW-1.
- Well GW-2 (Figure 25): Post-shutoff uranium concentrations were stable through October 2002; then they increased to October 2005, after which they have defined an overall decreasing trend. Uranium concentrations after the shutdown of pumping have been within the historical range of those before the shutdown. Furthermore, uranium concentrations between shutdown and October 2002 were similar to concentrations prior to the cessation of pumping, indicating that subsequent fluctuations were unrelated to the shutdown. Well GW-2 has not been sampled since July 2015 and can no longer be safely sampled due to its proximity to the unstable edge of Pipeline Arroyo canyon.
- Well GW-3 (Figure 26): Since shutoff, the concentrations increased from 0.059 mg/L in February 2001 to 0.423 mg/L when it was last sampled in July 2015, defining a linear rate of increase of +0.025 mg/L per year over this period of 14.7 years. GW-3 is the only Southwest Alluvium well to show a persistent increase in uranium since shutoff. However, this does not necessarily indicate a causal relationship between the increasing trend and shutoff. For example, nearby Wells GW-1 and GW-2 have exhibited different concentration changes over the same time-frame. It is not clear what physical or chemical mechanism stemming from the shutoff could account for changes so heterogeneous in degree and timing over a relatively small downgradient area. Uranium concentrations in many Southwest Alluvium wells have shown that variously gradual to steep uptrends and downtrends are typical, whether they occur during pumping or in the absence of pumping. In previous annual reports it was observed that starting in approximately January 2008, there has been little to no covariance between the bicarbonate and uranium concentrations, an interpretation likely affected by periodic fluctuations in the bicarbonate concentrations. However, with the inclusion of the 2013 through 2015 data, Figure 26 demonstrates uranium and bicarbonate covariance since July 2009 in that both have followed increasing trends: uranium increased from 0.125 mg/L (July 2009) to 0.423 mg/L (July 2015) and bicarbonate increased from 1,410 mg/L (July 2009) to 1,670 mg/L (July 2015). Hydrologic conditions may also influence uranium concentrations at GW-3. This well had a very short water column (when last measured in July 2015 at 2.07 ft, or 4 percent saturated thickness) at the edge of the saturated zone in the Southwest Alluvium and the piezometric surface was projected to be below the base of

the alluvium. By comparison, in October 2003 the water column here was 7.52 ft tall (representing 13% saturated thickness). The declining saturated thickness observed near Well GW-3 may have contributed to the elevated uranium concentrations (i.e., consistent with the hypothesis developed by NRC (1996)). Furthermore, at these low saturated thicknesses, Well GW-3 did not produce sufficient volume for sampling using low-flow sampling protocols such that it had to be sampled on the next day to acquire the necessary sample volume. As the saturated thickness declined, the well is interpreted to have become isolated or hydraulically disconnected from the Southwest Alluvial flow system; samples collected under these conditions are not representative because the groundwater has had greater opportunity to geochemically evolve and reach local equilibrium with the formation. Well GW-3 can no longer be safely sampled due to its proximity to the unstable edge of Pipeline Arroyo canyon.

- Well 624 (Figure 27): Post-shutoff concentrations have been stable at the lower end of the historical range. This chart also shows the bicarbonate time series at this well. Unlike the periods of covariance between uranium and bicarbonate shown in Wells GW-1 (through April 2002) and EPA 25, Well 624 conspicuously lacks covariance. This observation is discussed later in this section.
- Well 632 (Figure 28): Post-shutoff concentrations have been stable at the lower end of the historical range (excluding a drop to non-detect in April 2004).
- Well 627 (Figure 29): Post-shutoff concentrations have been stable at the lower end of the historical range.
- Well 808 (Figure 30): This well was installed in conjunction with the planned shutoff of the extraction well system; it has no pre-shutoff history. The post-shutoff uranium concentration showed a large upward spike through September 2001; since then the trend was strongly downward through October 2002, subsequent to which the concentrations have stabilized and show a decreasing trend.
- Well EPA 23 (Figure 31): Post-shutoff concentrations have been very stable at the lower end of the historical low range.
- Well EPA 25 (Figure 32): Uranium concentrations were stable from July 1999 to January 2007, after which covariant increases of uranium and bicarbonate concentrations are observed. This chart also shows that the covariance of uranium and bicarbonate concentrations occurred over most of the history of monitoring. The onset of seepage impact at this well occurred during October 1995. An upward step in bicarbonate concentrations started in April 2006, while an apparent upward step in uranium concentrations started slightly later in January 2007. These geochemical changes occurred many years after the shutoff of the pumps. EPA 25 uranium concentrations appear to have stabilized over approximately the past five years at levels substantially lower than the NRC standard (October 2019, 0.114 mg/L). This uranium-bicarbonate relationship can be explained by the basic geochemical principles presented by GE (2006). EPA 25 is along the northwest flank of the bicarbonate impact area (see Figure 8).
- Well EPA 28 (Figure 33): Concentrations were quite stable from July 1989 until 2014 when concentrations decreased from 0.0526 mg/L in March 2014 and stabilized around 0.020 mg/L since January 2016. The concentration in October 2018 was 0.0189 mg/L and 0.0203 mg/l in October 2019. This slight increase corresponds with a slight increase in bicarbonate concentration observed during the same period (Figures 13 and 15).
- Well SBL-01 (Figure 34): Uranium concentrations at this cross-gradient background well have varied from 0.005 mg/L to 0.0085 mg/L in 2019.

This comprehensive review of historical uranium concentrations demonstrates that most of the seepage-impacted wells have shown overall stable to decreasing trends since shutoff. Exceedances of the Site license standard for uranium have been limited to one in Well 509 D during October 2010 and twelve in Well GW-3 (all between October 2012 and July 2015). All the other wells have shown post-shutoff

concentrations within their pre-shutdown historical ranges, and many of the wells show that both gradual and sudden variations are common. The GW-3 uranium exceedances appear to be isolated spatially and analytical results since July 2009 indicate the covariance of uranium with bicarbonate concentrations. The short water column at this location may also have affected observed uranium concentrations. Uranium concentrations in many Southwest Alluvium wells have shown that variously gradual to steep uptrends and downtrends are typical, whether they occur during pumping or in the absence of pumping. UNC concludes that pumping would not result in a general Southwest-Alluvium-wide improvement in groundwater quality with respect to uranium or any other constituent.

EPA (2008) has stated (p. 53, Issue # 4):

"If the source of the uranium is the alluvial sediment, the increase in bicarbonate levels, as believed to be controlled by the shutoff, would be expected to influence the distribution and concentration of uranium. The bicarbonate levels are believed to determine whether or not the non-tailings-sourced uranium is dissolved, precipitated, or adsorbed. Thus, if the bicarbonate continues to migrate, then any uranium which could be sourced from the alluvium is expected to mimic the bicarbonate and migrate accordingly. In light of this, there remain questions regarding the effectiveness of the extraction wells to improve ground-water quality with respect to uranium."

EPA (2008) indicated that this and related statements in their third Five-Year Review report derived from their review of the 2007 Annual Review Report (N.A. Water Systems, 2008a) and the evaluation of the regulatory significance of the occurrence and distribution of dissolved uranium in the Southwest Alluvium (GE, 2006). UNC concurs that degrees of covariance between bicarbonate and uranium groundwater concentrations have been demonstrated in many Southwest Alluvium wells, and that the alkalinity of seepage-impacted water can be a strong determinant of how much uranium will be partitioned between the aqueous and (a typically surface-bound) solid phase (GE, 2006). UNC also believes that the weight of empirical evidence demonstrates that re-starting groundwater extraction will not improve groundwater quality in the Southwest Alluvium.

Uranium concentrations attenuate via adsorption and/or precipitation such that background uranium concentrations decrease with increasing distances downstream and away from the arroyo centerline; this likely heterogeneity of the uranium distribution (of non-tailings origin) within the Southwest Alluvium sediments may inherently limit one's ability to predict the degree (or even presence) of such covariance. For example, the increase in bicarbonate to a plateau at Well 624 (Figure 27) starting in May 2000 is attributed to the migration of the bicarbonate "front" associated with tailings seepage-impact. However, this well shows no covariance between the bicarbonate and uranium concentrations. At least two interpretations are possible: (1) at this well location there is little to no adsorbed or precipitated uranium (i.e., solid phase) within the alluvial sediments; and (2) aqueous uranium that originated from upgradient tailings seepage impact has been strongly attenuated during transport and has not reached this location.

Excluding the sharp and singular increase in Well 509 D during October 2010 and 2012 to 2015 results in Well GW-3, the Southwest Alluvium wells have not shown exceedances of the Site license uranium standard (0.3 mg/L). The time-concentration plots indicate that natural attenuation, by neutralization and adsorption, is at least equally as effective as a pumping remedy. This conclusion is bolstered by earlier discussion indicating that in comparison to background water quality, the passage of the seepage-impact front presages an improvement in sulfate and TDS concentrations. However, the data also demonstrate that the interaction of the uranium in the Southwest Alluvium sediments with varying geochemical (e.g., bicarbonate) or hydrologic factors (e.g., reductions in saturated thickness, isolation from the groundwater flow system, or geochemical interaction with the underlying bedrock) may result in variable concentration

trends accompanied by localized exceedances of the current Site uranium standard (0.3 mg/l). The uranium standard in the Southwest Alluvium should be waived because the principal source of uranium for both background and seepage-impacted waters was the permitted mine discharge water rather than tailings seepage. It also is not possible to ensure that a standard will be achieved consistently throughout the seepage-impacted area as the geochemistry fluctuates and water levels decline over time. Moreover, the standard will only be attained upon extraction of all water in the alluvium, which is not practicable.

2.3.5.6 Pb-210

During 2018, there was one unusual Pb-210 detection in the Southwest Alluvium samples (Well 801 at 6.8 pCi/L in April 2018) that exceeded the NRC license standard (and revised EPA standard) of 5.9 pCi/L. This was the first exceedance of the Pb-210 standard at Well 801 since 1997. The 2019 Well 801 Pb-210 activities were non-detected in all four quarterly samples.

3 Zone 3

3.1 Corrective Action Summary

3.1.1 Northeast Pump-Back and Stage I and II Remedial Action Systems

The historical corrective action in Zone 3 consisted of pumping the three sets of extraction wells shown on Figure 35: (1) Northeast Pump-Back System (green triangles), (2) Stage I Remedial Action System (empty black squares), and (3) Stage II Remedial Action System (filled blue squares). The Northeast Pump-Back wells started operation in 1983; the Stage I and II wells were added later as part of the Remedial Action Plan (UNC, 1989b) implemented in 1989. While operating, the corrective action system in Zone 3 performed as designed to enhance dewatering of the seepage-impacted area and remove constituent mass.

The numbers of operating extraction wells were reduced as Zone 3 dewatering caused sustainable pumping rates to drop below 1 gpm. The number and pumped volumes of the former extraction wells, during the period of Zone 3 corrective action from 1989 through 2000, have been summarized in Earth Tech (2002c, Figure 3-2). Pumping from the last three of these extraction wells ceased in 2000. The NRC amended the license (with approval from NMED and EPA) to shut off the three remaining wells (716, 717, and 718) in December 2000. This decision included a provision for UNC to submit a modified corrective action plan, an application for ACLs, or an alternative to the specific requirements of 10 CFR Part 40, Appendix A, if the license standards are not achievable. With respect to the source materials license, the corrective action program in Zone 3 has undergone significant evaluation and evolution since the pumping was temporarily ceased over a decade ago. Notably, UNC conducted pilot programs involving hydraulic fracturing to improve well yields, and an alkalinity stabilization program to neutralize the acidic uranium mill tailings seepage. These efforts have been documented in several reports and correspondence and are also summarized in the Annual Reports that are required under Condition 30.C (including the current report).

3.1.2 2004 Supplemental Feasibility Study

At the request of the EPA (2004b), UNC conducted a Supplemental Feasibility Study (SFS) to evaluate all appropriate remedial options for Zone 3. Prior to reporting the SFS (MWH, 2004), UNC submitted (2004) a Technical Memorandum including a chronology of events that led to UNC's initiative to aggressively

develop remedy modifications or enhancements that might improve the performance of the remedy in Zone 3. The SFS report presented (1) groundwater modeling of the Zone 3 sandstone unit and the locally overlying alluvium, (2) pilot-hole hydrofracturing study results, (3) a remedial alternatives analysis, and (4) conclusions and recommendations for enhancing or optimizing remedies for Zone 3.

Two studies were conducted based on recommendations of the SFS. These were an in-situ alkalinity stabilization pilot study and the pilot and Phase I hydrofracture program. These studies are described below.

3.1.3 In-Situ Alkalinity Stabilization Pilot Study

UNC conducted an in-situ alkalinity stabilization pilot study to evaluate the potential to enhance the ongoing Zone 3 remediation through the use of alkalinity injection wells combined with carefully controlled extraction pumping at the Site. The proposed approach for the pilot study was presented in the In-Situ Alkalinity Stabilization Pilot Study (BBL, 2006), which was approved by EPA.

The pilot study was initially designed to test the injection of alkalinity-rich groundwater from a non-seepage-impacted part of the Southwest Alluvium into the Zone 3 aquifer. The injected water (so-called "fixiviant") would flow through the Zone 3 formation to recovery wells where the fixiviant could be pumped to the surface for treatment and disposal. However, NMED expressed concerns that the groundwater from the Southwest Alluvium did not meet applicable groundwater standards for sulfate, TDS, and manganese. The pilot study approach was revised to include injection of water withdrawn from the Westwater Canyon Formation via the Mill Well (amended with sodium bicarbonate to add alkalinity) into Zone 3 (BBL, 2006).

The pilot study was conducted from October 24, 2006, to February 15, 2007. The observed injection and extraction rates were unexpectedly low. As a result, the estimated travel time between the injection and extraction wells became prohibitively low and the pilot test was terminated. The pilot study results indicated that the mineral feldspar in the Zone 3 arkosic sandstone had been altered by the acidic tailings liquids, generating kaolinitic clay that clogged pore spaces and significantly reduced hydraulic conductivity. Under these conditions it would take 10 times longer to accomplish remedy goals than had been hypothesized; a remedy enhancement anticipated to take approximately 5 years could actually take 50 years or more. Based on these results, it was concluded that the use of alkalinity rich solutions to remediate the Zone 3 seepage-impacted groundwater in-situ was infeasible (ARCADIS BBL, 2007).

3.1.4 Phase I Hydrofracture Program and Continuing Zone 3 Extraction Well Pumping

Seepage-impacted groundwater extraction from a new array of wells (identified as RW-series wells in the northern part of Zone 3 in Section 36; see Figure 36 and Appendix B; Figure B.1) was tested in April 2005 as part of the Phase I (i.e., post-pilot) hydrofracture program (MACTEC, 2006). Continuous pumping of Wells RW-11, RW-12, RW-13, RW-15, RW-16, and RW-17 began in May 2005 (RW-14 was located in an area with less than one foot of saturation in Zone 3 and was not used as an extraction well). The new pumping array initially had three beneficial effects:

- Capture of most, if not all, of the northward-advancing seepage-impacted water (i.e., partial hydrodynamic control);
- Marked groundwater quality improvement and recession of the seepage-impact front to the south;

- Dewatering and mass removal.

However, the groundwater quality improvement was temporary due to declining pumping rates and several extraction system modifications were subsequently made. Well PB-02 was converted to an extraction well in November 2005 to complement the RW-series pumping wells in the northern area of the seepage-impacted water. Pumping from recovery Well RW-A was started during September 2007 at a location recommended by MACTEC (2006) to augment hydraulic containment (see their Figure 3.11). Extraction Wells PB-02, RW-12, RW-13, and RW-15 were later idled, due to fouling and/or insufficient yield.

Five new extraction wells (NW-1 through NW-5) were sited based on a UNC analysis (N.A. Water Systems, 2008c) and installed during September 2008 to intercept and recover seepage-impacted water. These well locations are shown on Figure 35 and Appendix B; Figure B.1. All five wells were tested for a short period beginning in February 2009 to determine that they were pumping properly; pumping ceased at NW-4 and NW-5 in March 2009 and continued at Wells NW-1, NW-2, and NW-3. During November 2009, NW-3 was shut down to minimize the potential of drawing seepage-impacted groundwater to the northwest and pumping was initiated at NW-4. Yields subsequently declined and pumping was suspended at NW-1 in May 2012 and at NW-4 on October 21, 2015. Pumping was initiated at NW-5 on March 16, 2016 as a replacement for NW-4. The pumping rates at NW-2 and NW-5 averaged approximately 0.044 gpm and 0.175 gpm, respectively, during the November 30, 2018, through December 2, 2019, monitoring period. This flow rate range is lower than that reported for the 2018 monitoring period (0.15 to 0.25 gpm) and well below the 1 gpm NRC decommissioning criterion. Well NW-2 reached the end of its capability as a pumping well during 2019.

The Zone 3 corrective action system during 2019 comprised groundwater extraction from RW-11, RW-16, RW-17, RW-A, NW-2, and NW-5. Approximately 19,366,000 gallons of groundwater have been pumped from this new Zone 3 extraction well network from January 2005 through the end of November 2019 and piped to the evaporation pond. Extraction from Well NW-2 was suspended on November 13, 2019, because the water level dropped below the pump intake and well recharge was insufficient to reliably operate the pumping system.

3.1.5 Evaluation of the Effects and Limitations of Zone 3 Extraction Well Pumping

Twenty-nine years of remedial pumping have resulted in significant dewatering of Zone 3. One effect of this is that once the saturated thickness falls to approximately 25 ft or less, well efficiency declines and pumping rates fall to less than 1.0 gpm (Earth Tech, 2001). Appendix A of the ROD (EPA, 1988b) anticipated that these "significant declines in pumping rates with time due to insufficient natural recharge of aquifers" will occur and that "In the event that saturated thicknesses cease to support pumping, remedial activity would be discontinued or adjusted to appropriate levels."

Table 7 presents the reductions in saturated thickness for Zone 3 monitoring wells between the third quarter of 1989 and the fourth quarter of 2019. Values of saturated thickness greater than 25 ft are shaded on this table. Beginning in 2012, none of the monitored Zone 3 wells met this criterion. The saturated thickness measured in Zone 3 wells has declined by approximately 81 percent on average since the third quarter of 1989. Figure 35 shows that between 1989 and the fourth quarter of 2019, a very large portion of the Zone 3 Remedial Action Target Area has been desaturated (effectively dewatered). The eastern limit of Zone 3 saturation has shifted to the west-northwest over this time period (from the location of the wavy blue line, showing the saturation limit in 1989, to the dashed brown line showing the approximate October 2017 "zero" saturation limit). Figure 37 shows the overall dewatering effects of both

the former and the current Zone 3 remediation pumping. The figure identifies the start of recovery pumping from the well array installed during the hydrofracture study in April 2005. Zone 3 water levels are demonstrated to be declining with time at all wells, except Well 446, which is no longer valid because the water level is below the bottom of the screened interval (there is a 10-ft section of blank well casing below the well screen) and it is difficult to measure due to the presence of a floating natural oil lens. Additionally, the Well 420 water level dropped below the screened interval and the base of Zone 3 beginning with the April 2017 measurement (water levels were possible because a 5-ft section of blank well casing extends below the well screen). Measured values are not representative of Zone 3 and are therefore no longer valid. Monitoring wells that do not meet monitoring objectives are considered candidates for decommissioning, which may be recommended to NRC in a future license amendment request.

The main reason that the groundwater flows toward the north is that the Zone 3 bedrock unit dips toward the north. The hydraulic head that drives the flow comprises two components: the elevation head plus the pressure head. The long history of extraction pumping in Zone 3 has reduced the pressure head component of the total hydraulic head. However, it is not possible to reduce the slope-related elevation head – that is a driving force component that cannot be changed (N.A. Water Systems, 2008b). Continued pumping has been helping in the short-term as Figure 37 shows; however, the Zone 3 saturated thicknesses are quite thin and eventually there will be no further possible reduction in the pressure head. The effort to counteract the overall hydraulic head is gradually approaching practical limits as the well yields decrease.

The inherent difficulty of pumping seepage-impacted water in northern Zone 3 is demonstrated by the small groundwater flux. N.A. Water Systems (2008c) calculated that the groundwater flux (without any pumping) along a 1,200-ft long, west-northwest trending line of cross section located between Wells NBL-01 and PB-03 was 512 ft3/day (2.7 gpm) during January 2005. This flux estimate has decreased as a result of the ongoing reduction of saturated thickness.

The revised Zone 3 pumping system has been declining in performance and active remedial operations in Zone 3 are reaching the limits of their effectiveness as anticipated by Appendix A of the ROD (EPA, 1988b) and acknowledged in EPA Five-Year Review reports (e.g., EPA, 1998; EPA, 2008; EPA, 2013; EPA, 2018). All of the Zone 3 wells have reduced average yields that are below 0.3 gpm and pumping at Wells NW-1, NW-2, NW-4, and PB-02 has been suspended in recent years (NW-2 during November 2019) due to low yield, decreased water levels, and insufficient water pressure. The following physical factors have controlled these declining yields:

- Encrustation along the wellbore of iron oxyhydroxides, carbonates, and/or gypsum;
- Precipitation of amorphous aluminosilicates (e.g., EPA 14);
- Alteration of feldspar to clays within the bedrock matrix; and
- Reduced saturated thicknesses.

Pumping was initiated at NW-5 on March 16, 2016, as a replacement for NW-4 (shut down in October 2015) at a pumping rate of approximately 0.5 gpm (the current average flow is below 0.2 gpm). This pumping is intended to slow the potential migration of seepage-impacted water north of the Section 36 boundary. However, the operation of NW-5 resulted in a slight northwestward shift in the mapped areal extent of seepage-impacted water (see Section 3.3.2 and Figure 35). Similarly, a slight northward shift in the seepage-impacted water extent depicted on the October 2019 map is attributed to the pumping of NW-2 until November 2019. The combined time-averaged extraction rate of the six wells pumping in northern Zone 3 in the 2019 monitoring period (November 30, 2018 through December 2, 2019) was

approximately 0.7 gpm, which constitutes approximately 26 percent of the 2.7 gpm total flux calculated in January 2005. UNC personnel have reported some concerns about the reliability of the extraction well flowmeter data as the saturated thickness declines, due to both the low flow rates/volumes and the presence of suspended clays that coat the flowmeter components and periodically render them inoperable. UNC will continue to evaluate flow monitoring methods in the future as needed. While acknowledging these potential metering limitations, the efficiency of seepage-impacted water removal has declined with time and decreasing saturated thickness and is expected to continue to degrade. Seepage removal efficiency will be considered in the SWSFS as the means to evaluate the effectiveness of any proposed remedy alternatives utilizing pumping wells.

Groundwater quality in northern Zone 3 has been shown to have oscillated between degrading and improving trends (see Section 3.3.2 and Chester Engineers, 2015a). The variations in water quality indicate that there have been local and variable degrees of mixing of seepage-impacted water with background water drawn in from the west and north. Consistent with UNC's original recommendations (N.A. Water Systems, 2008c) and a later update (Chester Engineers, 2009c), UNC has adjusted the pumping regime among the NW-series wells as needed to attempt to: (1) limit the withdrawal of background water; (2) limit the tendency for seepage-impacted water to be drawn westward or northward; and (3) improve the capture of seepage-impacted water. As always, the goal is to strike the best balance between containing the seepage-impacted water while minimizing its transport to the more thickly saturated but non-seepage-impacted parts of Zone 3.

UNC continues to evaluate the chemistry, water levels, and well yields in Zone 3, which may result in recommendations for further modifications to the extraction system operations (e.g., initiation of pumping from additional or different locations). Extraction wells having yields below the 1 gpm decommissioning criterion may be recommended to NRC for decommissioning in a future license amendment request. Extraction system operational data may also be considered with respect to remedy alternative evaluations performed in the SWSFS.

3.1.6 Injection Well Feasibility Testing and Pilot Study

Injection well feasibility testing, and its historical context, has been discussed in previous Annual Reports (e.g., Chester Engineers, 2010a; 2011a; and 2012b). The first injection testing was in background Well NBL-02 (Chester Engineers, 2009d). The second injection testing was in the pilot injection Well, IW-A (Chester Engineers, 2010b).

On April 14, 2011, injection of water amended with sodium bicarbonate (2 grams per liter) started at Zone 3 Well IW-A (Chester Engineers, 2011c). The objectives of the injection were to (1) locally buffer and geochemically stabilize the seepage-impacted water with alkalinity (sodium bicarbonate), (2) redirect the seepage-impacted water into the capture zones of the northernmost extraction wells, (3) extend the life of the extraction wells by arresting the drawdown, and (4) provide a hydraulic barrier to the northerly advance of seepage-impacted groundwater. The injection capacity at IW-A declined over time. In late June 2012 the capacity had declined to ~ 0.2 gpm (288 gpd) and it became very difficult to meet the target injection water level. On June 29, 2012, the injection at IW-A was terminated after a total of 426,363 gallons of water had been injected.

An additional important reason that the alkalinity injection pilot study was terminated was the reported increase in the uranium concentration at monitoring Well MW-6, from 0.082 mg/L in July 2011 to 0.321 mg/L in July 2012 (see Appendix B; Table B.1). GE (2012a) discussed two possible explanations for the uranium concentration increase: (1) The remedial system was drawing-in background water (post-

mining/pre-tailings) which contains higher uranium concentrations than either the MCL or seepage-impacted water (N.A. Water Systems, 2008e, 2008f); and (2) the possible influence of the sodium bicarbonate (NaHCO3) amended water that was injected at Well IW-A. Some combination of both reasons likely explains the changes in the uranium concentration data, and because the relative contribution of each cause is unknown, it was prudent to permanently discontinue the injection of alkalinity-amended water. NRC concurred with the decision (Roy Blickwedel, GE, personal communication with Yolande Norman, NRC, October 2012).

3.2 Mass of Chemical Constituents Removed

The mass of chemical constituents removed by extraction well pumping was calculated for the 12-year period from July 1989 through June 2000. These calculations were presented in the previous annual reviews, and the final summary is presented in the 2000 Annual Review (Earth Tech, 2000e).

As previously discussed, the current extraction well pumping phase originated with the hydrofracture program and comprises RW-series the NW-series extraction wells (Figure 36 and Appendix B; Figure B-1). Table 8 shows the estimated mass removal by this pumping from November 30, 2018, through December 2, 2019. The recovered masses were estimated by multiplying the volume of groundwater pumped by the estimated concentration of each constituent in the pumped water. The constituent concentrations were estimated from concentrations measured in groundwater samples taken from the extraction wells and nearby monitoring wells during October 2019 (with exceptions noted in Table footnotes).

Pumping volumes have decreased over time. Table 8 shows the estimated total volume of water extracted during the period from November 30, 2018 to December 2, 2019 (365,784 gallons), which is approximately 30 percent less than that pumped (519,948 gallons) from December 2017 through November 2018. Acknowledging potential metering limitations, the decreases demonstrate that pumping yields are well below the NRC decommissioning criteria and are having only marginal benefits, at best, as anticipated by Appendix A of the ROD (EPA, 1988b) and acknowledged in EPA Five-Year Review reports (e.g., EPA, 1998; EPA, 2008; EPA, 2013).

3.3 Performance Monitoring Evaluation

3.3.1 Water Level Evaluation

The water level monitoring component of the current Zone 3 performance monitoring program is summarized in Table 9 and comprises quarterly monitoring of water levels in 22 wells. Well NBL-01 is not a formal requirement of the performance monitoring program but was also monitored for water level until it was dewatered [see note on Table 9]). Supplemental water level measurements are made at additional monitoring locations on quarterly or annual basis to support reporting and remedy evaluation efforts. The saturated thickness has decreased at four of the water level performance monitoring locations (Wells 504 B, 446, NBL-01, and 420) such that they no longer provide adequate and/or representative data. Starting in January 2011, water levels in Well 504 B became too low to allow sampling and the well went dry in 2012. Water level measurements in Well 446 are no longer valid because the water level is below the bottom of the screened interval and it is difficult to measure due to the presence of a floating natural oil lens. Well NBL-01 is within an area of active recovery well pumping; should pumping be terminated it could again become relevant. As of April 2017, the water level in Well 420 was below the base of Zone 3 and the screened interval of the well. Although reported here, water level measurements and water samples collected during 2019 and since April 2017 at this location are considered not to be

representative of Zone 3 (the water chemistry associated with Zone 2 [primarily shale and coal] would be expected to be dissimilar) and therefore, not valid. Well 420 may be influenced by active pumping of the RW-series wells, so it could also become relevant again if pumping were to be terminated. Monitoring wells that do not meet monitoring objectives are considered candidates for decommissioning, which may be recommended to NRC in a future license amendment request.

Water level data from 1989 through October 2019 are presented for sampled wells in Appendix B; Table B.1. Figure 36 shows the locations of extraction wells, monitoring wells, and the October 2019 potentiometric surface based on groundwater elevation measurements. This potentiometric map, which has a 5-ft contour interval, indicates that groundwater flows toward the north and northeast. Overall, the potentiometric field is similar to those depicted in recent annual reports. The water levels in the vicinity of Wells NW-2 and NW-5 are consistent with the convergence of groundwater flow lines toward these extraction wells. Observations from 2013 through 2019 indicate that water levels at certain northern Zone 3 wells have decreased significantly in response to pumping.

Groundwater discharge into Pipeline Arroyo, associated with historical mining operations, ceased in 1986. Since then, Zone 3 water levels have been declining and groundwater flow directions became more generally north-northeasterly as recharge from, and groundwater mounding within, the alluvium to the southwest and west has steadily decreased (Chester Engineers, 2012c, 2014b). The earlier east-to-northeast flow direction caused the distribution of groundwater impacts that was the original basis for delineation of the Zone 3 Remedial Action Target Area, as shown on Figure 35. Effects on the potentiometric surface from alluvium recharge (mine-dewatering groundwater discharge) have largely dissipated, and rates of water level change in Zone 3 are mostly very slow (excluding the influence of recent pumping). Pumping of extraction wells prior to January 2001 temporarily accelerated the local rates of water level decline until the saturated thickness was reduced to less than ~ 25 ft, after which the decline in levels slowed to natural rates of drainage. In October 2019, the collective average saturated thickness for all measured Zone 3 wells (Table 7) has reduced to approximately 8.5 ft.

Contours of saturated thickness during the October 2019 monitoring event (Figure 38) show the combined effects of former pumping, current pumping, the former injection program, and natural drainage on Zone 3. The values posted on Figure 38 are calculated saturated thickness values for wells that have a measured water level during the October 2019 monitoring event. There is no saturated thickness value posted for Well 420 because the measured water level value is below the base of Zone 3. The October 2018 and 2019 maps show a notable westward adjustment in the eastern zero saturation boundary in the vicinity of Wells 446 and RW-12 (originally made in the 2017 Annual Review report [Hatch Chester, 2018]) that reflects an increasing importance of undulations of the Zone 3 base surface in this area. Overall, the eastern extent of saturation has contracted to the west, so that the current boundary of saturation is approximately where the 25-ft saturated thickness contour was located in 1989 (for comparison, see Earth Tech, 2002c, Figure 3-1).

Wells located to the west, closer to the former recharge area, also have lost substantial saturation. For example, Well EPA 14 had 76 ft of saturation in 1989 and 17.58 ft in October 2019 (a 77 percent reduction in the saturated thickness; see Table 7). Table 10 shows the saturated thickness in each Zone 3 well during October 2019. From 2002 through 2019, most wells have shown overall decreasing groundwater elevations (usually with small fluctuations), indicating that the Zone 3 potentiometric field that drives groundwater flow and constituent migration continues to become lower as the groundwater further drains away. Pumping has removed more than 19.3 million gallons from 2005 through December 2, 2019.

The southwest part of Figure 35 shows the approximate contact area between the alluvium and the top of Zone 3. Former versions of this figure have shown an inferred area of saturation along this contact area (e.g., see Figure 35 in the 2008 Annual Report). N.A. Water Systems' (2008c) analysis of the groundwater flow through Zone 3 indicated little or no contribution from other sources (e.g., alluvium) than the ongoing self-drainage. There was very little flow crossing the southern, east-west directed cross section line near Well 613 (N.A. Water Systems, 2008c; Figure 7), which is 1,642 ft long: the flux here in January 2005 was estimated to be 723 gallons per day (0.5 gpm). Chester Engineers (2011d) summarized the lack of empirical evidence for discernible recharge into Zone 3. However, accounting for episodic recharge via streambed infiltration was found to benefit the calibration of the Site numerical flow model in the accuracy of its simulation of Zone 3 piezometric heads (Chester Engineers, 2012c, 2014b). Without such an accounting the model simulated a decline of the Zone 3 piezometric surface that exceeded that measured over the prior 12 years. The basis for this interpretation of Zone 3 recharge remains theoretical rather than empirical.

3.3.2 Water Quality Evaluation and Current Extent of Seepage-Impacted Water

3.3.2.1 Water Quality Evaluation

The temporary saturation caused by the infiltration of groundwater discharged into Pipeline Arroyo, during mining activities, is considered the background water for Zone 3 (EPA, 1988a; 1988b; 1998). This background water was later impacted by acidic seepage from tailings in the North Cell. These seepage fluids contained elevated concentrations of metals, radionuclides, and major ions including sulfate and chloride. Source control (neutralizing and later dewatering of the North Cell), neutralization of the seepage by natural attenuation, and mixing with the background water have reduced constituent concentrations.

Seepage-impacted water, some of which exceeds NRC license standards and/or EPA cleanup standards, is contained within the property boundary in Section 36. The portion of the Zone 3 seepage-impacted water that extends off the property into Section 1 (Figures 6 and 35) was eliminated as a point-of-exposure (POE) because of limited saturation. The decision to eliminate this area as a Zone 3 POE is documented in a letter from the NRC (1999b).

The current water quality monitoring component of the Zone 3 performance monitoring program is summarized in Table 9 and comprises quarterly sampling at 10 wells. The current monitoring program went into effect in the second quarter of 2000 and adjustments were subsequently made the request of the NRC. Well 504 B can no longer be sampled; in January 2011 water levels in 504 B became too low to allow sampling, and the well went dry in 2012. As of April 2017, the water level in Well 420 was below the base of Zone 3 and the screened interval of the well. Therefore, water level measurements and water samples collected since April 2017 at this location are considered not to be representative of Zone 3. Well NBL-01 (which is not included among the 10 wells on Table 9 because it is not currently identified as a monitoring point in the NRC license) was installed in 2001 to both bound the downgradient extent of the seepage-impacted water and function as a tracking well. However, NBL-01 is within an area of active recovery well pumping and has not been sampled since January 2013 due to decreased water levels and sediment accumulation in the well. Should pumping be terminated in northern Zone 3, it could again become relevant as a monitoring point.

POC Well 517 does not meet performance criteria associated with low flow groundwater sampling methods, which limits the ability to collect representative samples. Drawdown measured at Well 517 during implementation of the low-flow sampling protocol exceeds the two-foot maximum drawdown

specified in the SOP (Chester Engineers, 2015a). The protocol is intended to avoid increased flow velocities into the wellbore, which might increase sample turbidity and enhance local mobilization of constituents. This is contrary to the objective of low-flow sampling to measure naturally mobile constituent concentrations present in the formation outside the well. Well 719 also has a very low volume available for sampling and is considered to have "borderline" suitability for low-flow sampling methods (Chester Engineers, 2015a). Monitoring wells that do not meet operating criteria are considered candidates for decommissioning, which may be recommended to NRC in a future license amendment request.

The following groups of wells serve, or have previously served, as supplemental Zone 3 monitoring locations for field measurements and/or laboratory analyses:

- The northern tracking wells have served to track the advance of the northernmost seepage-impact boundary and have historically comprised Wells 504B, NBL-01, the PB-series wells, recovery Well RW-A, and Well NBL-02 (Figure 35). During 2019, the only northern tracking wells with sufficient saturated thickness for sample collection were Well NBL-02 and recovery Well RW-A.
- Extraction Wells NW-1 through NW-5 were installed during September 2008 to intercept and recover seepage-impacted water (see well locations on Figure 35 and Appendix B; Figure B-1) and are used to track the advance of seepage-impacted water in northern Zone 3. Wells NW-2 and NW-5 were pumped during 2019. The historical pumping of these wells is described in Section 3.1.4. The average pumping rates at NW-2 and NW-5 during the November 30, 2018, through December 2, 2019, monitoring period were approximately 0.044 and 0.175 gpm, respectively. Groundwater extraction from well NW-2 was suspended on November 13, 2019, because the water level dropped below the pump intake and well recharge was insufficient to reliably operate the pumping system.
- Monitoring Wells MW-6 and MW-7 were installed north of the seepage-impacted area in 2010 in association with the alkalinity injection pilot study (Figure 35).

The following summarizes the Zone 3 supplemental water quality monitoring that is not a formal requirement of the performance monitoring program:

- To improve the understanding of the groundwater quality along the northern front of the seepage-impacted water in Zone 3, the following additional wells were sampled during 2019 for the full laboratory chemical parameter list (see Appendix B): samples are collected annually from Wells RW-A, RW-11, NW-5 (beginning in 2019), and NBL-02 for the full parameter list; NW-3 has been sampled quarterly for the full parameter list since October 2016; and MW-7 has been sampled for the full parameter list quarterly since July 2012 (with exceptions due to technical issues).
- Monthly measurements of select field parameters (pH, conductivity, chloride, and alkalinity [of which bicarbonate is the principal component]) continued during 2019 in the northern tracking wells (now limited to Wells RW-A and NBL-02). Table 11 presents the historical monthly field parameter measurements for the northern tracking wells. Quarterly laboratory analytical results for these wells are provided in Appendix B; Table B.1.
- Monthly field parameter measurements were made at the five NW-series wells and MW-7 (Table 12). These measurements have been made in the NW-series wells since June 2009 and starting in August 2011 in Well MW-7. The monthly field parameter measurements have not been made for MW-6 since September 2015 or in NW-1 since May 2019 due to decreased water levels.
- As a check of the monthly field parameters, quarterly samples were taken from several northern Zone 3 wells (RW-A, NBL-02, NW-2, NW-3, NW-4, NW-5, and MW-7) for laboratory analysis of bicarbonate, pH, TDS (in lieu of conductivity), and chloride (see Appendix B; Table B.1). Based on these comparisons, the field parameters were determined to provide a good indication of the migration of

the seepage-impacted water. Samples for laboratory analysis of field parameters were previously collected from Well NW-1 but could no longer be collected during 2019 due to a lack of available volume.

The following additional wells used historically for supplemental monitoring can no longer be sampled:

- Well MW-6 was sampled for the full parameter list quarterly from July 2012 to April 2014 and for monthly field parameter measurements from August 2011 to September 2015. The measurements were discontinued due to decreased water levels and insufficient sample volume.
- Well PB-02 was sampled at least annually during October since 2008 for the full laboratory parameter list but has not been sampled since July 2013 (pumping was discontinued).
- Wells PB-03 and PB-04 were sampled annually in October from 2010 to 2014 for the full laboratory chemical parameter list but have not been sampled beginning in October 2014 due to insufficient sample volume. Beginning in October 2015, the monthly field parameter measurements have also no longer been made at PB-03 and PB-04 due to insufficient sample volume.
- Well NBL-01 was previously sampled quarterly but was last sampled in January 2013 due to decreased water levels and sediment accumulation in the well.

A summary of laboratory analytical detections for the Zone 3 monitoring locations in the October 2019 monitoring event is provided in Table 14. Historical quarterly groundwater quality and groundwater elevation data through October 2019 are provided in Appendix B; Table B.1 and a comparison table of total and speciated arsenic and selenium results is provided in Appendix D. The Site groundwater standards used for data comparisons in this annual report were revised through the development of updated BTVs by statistical analysis. NRC issued a license amendment to update site GWPSs (NRC, 2015) and EPA approved the use of the UNC proposed cleanup levels (EPA, 2015) for remedy alternative evaluation in the ongoing SWSFS.

The Zone 3 NRC POC Wells (517, 613, 708, and 711) are within the most highly seepage-impacted water (Figure 35; the pH 3.0 contour has been omitted for figure clarity). The following constituents exceeded NRC license standards at the POC wells during the 2019 quarterly monitoring (the numbers of exceedances are shown in parentheses):

NRC POC Wells:

- Well 517 – nickel (4).
- Well 613 – beryllium (4), nickel (4), vanadium (4), uranium (4), selenium (total, but not Se IV) (3), and thorium-230 (4).
- Well 708 – beryllium (3).
- Well 711 – nickel (3).

NRC license standards were also exceeded at the following Non-POC monitoring well locations during 2019:

- Well 717 – beryllium (4), nickel (4), uranium (4), and selenium (total but not Se(IV]) (2).
- Well NW-3 – arsenic (total) (3) and As[III]) (4) and gross alpha (1).
- Well EPA 13 – arsenic (total but not As[III]) (1).

Additionally, EPA cleanup standards were exceeded at Zone 3 monitoring locations for beryllium, TDS, sulfate, aluminum, cobalt, and manganese during 2019. These are constituents that are not regulated by

NRC, or for which the EPA cleanup standard is lower than the NRC license standard (i.e., beryllium). The analytical results are further discussed relative to the seepage impact extent in this section and relative to natural attenuation performance in Section 3.3.4. It is important to recognize that elevated analyte concentrations (including reported exceedances of historical NRC or EPA standards) in some Site wells represent background water quality. Background water quality is discussed further in the natural attenuation system performance evaluation (see Section 3.3.4).

3.3.2.2 Current Extent of Seepage-Impacted Water

Until groundwater discharges to Pipeline Arroyo ceased in 1986, seepage impacts in Zone 3 migrated to the east and northeast, due to groundwater mounding in the alluvium recharge area to the west. As the hydraulic head in the alluvium recharge area decreased (and with it the rate of recharge), migration shifted toward the north (in relatively southern locations) and northeast (in more northerly locations), subparallel to the eastern edge of saturation and the bedrock dip direction. Furthermore, as predicted in the EPA's First Five-Year Review Report (EPA, 1998) and discussed in the Technical Memorandum (GE, 2000), continued pumping of the downgradient Stage II extraction wells caused the seepage-impacted waters to migrate to the northwest and north toward the pumping locations.

The following criteria have been used to distinguish background versus seepage-impacted groundwater quality in Zone 3:

- pH < 5 and bicarbonate < 100 and > 500 mg/L are useful (but not always definitive) indicators of seepage impact (see the Technical Memorandum [GE, 2000]). N.A. Water Systems (2008e, Figure 1) presented box-and-whiskers plots of bicarbonate and pH for the background wells. Seepage-impacted water with a pH < 5.0 has not yet migrated far enough to reach equilibrium, or to react sufficiently, with carbonate minerals in the Zone 3 strata (Canonie, 1987, Table 4-5 indicates a measured CaCO3 content of 0.02 percent in the Zone 3 bedrock). A pH > 5.0 indicates either no seepage impact, or acid neutralization to varying degrees (usually a function of residence time and migration distance).
- In non-seepage-impacted areas, background water has approximately reached equilibrium with the carbonate minerals resulting in bicarbonate concentrations ranging from approximately 100 to 500 mg/L.
- Time-series of these two indicator parameters are very helpful (sometimes essential). See N.A. Water Systems (2008e, Appendix A) for time-series of pH and bicarbonate for the background wells.
- Time trends in the concentrations of major ions; in particular, decreasing ratios of Ca/Mg are associated with degrading groundwater quality (see Appendix B, e.g., Well EPA 14).
- Zone 3 time trends in the concentrations of many metals and radionuclides will usually increase as the water quality degrades from background to seepage-impacted (see Appendix B, e.g., Well EPA 15).

Seepage-impact extent is primarily based on evaluation of pH and bicarbonate concentrations over time in (1) seepage-impacted wells (e.g., Wells 613 and 517), (2) background and former background wells (e.g., Wells EPA 01 and 411), and (3) northern monitoring and extraction wells (i.e., the northern tracking wells, NW-series wells, and Well MW-7). Table 11 presents the historical monthly field parameter measurements for the northern tracking wells (from south to north: Wells 504 B, RW-A, PB-02, PB-04, PB-03, NBL-02, and NBL-01). Table 12 presents the monthly field parameter measurements for the newer NW-series and MW-series wells. Quarterly laboratory analytical results for these wells are provided in Appendix B; Table B.1. Bicarbonate time-series for most Zone 3 monitoring wells are shown in Figure 39, while Figure 40 shows a subset of the wells (selected based on the seepage impact perimeter). Historical groundwater quality data (see Appendix B; Table B.1) from fully seepage-impacted wells indicate that it

takes from one to three years, from the onset of geochemical changes associated with the arrival of seepage-impacted groundwater, for full seepage-impact to develop (unless the constituent transport is effected by pumping). Figure 35 shows the highly seepage-impacted water (i.e., a pH value of approximately 4.0 or below) in 2019, which is similar to that depicted in 2018. Groundwater quality along the northern tracking wells has been shown to have oscillated between degrading and improving trends (e.g., see NBL-01 and PB-series wells in Table 11, Appendix B; Table B.1); fully seepage-impacted water has exhibited very low pH values (e.g., Well NBL-01) and bicarbonate concentrations of 0 mg/L (additional details have been provided in previous Annual Reports [e.g., Chester Engineers, 2016]). Well NBL-01 was last sampled in January 2013. This relatively large pH and bicarbonate variation over short distances indicates that the groundwater quality is highly heterogeneous on the local scale of the related well array and that the seepage-impact front is proximal to the wells. This feature is interpreted to reflect the capacity of pumped wells to locally draw background quality groundwater into areas of seepage impact. The variability is inferred to be an effect of the revised pumping program that began in 2005.

The monthly field parameter measurements made in the two currently monitored northern tracking wells (Wells RW-A and NBL-02) are shown on Table 11. Well RW-A is an extraction well that is becoming increasingly seepage impacted. The RW-A laboratory bicarbonate concentration dropped below 100 mg/l in April 2016 and the field bicarbonate concentration dropped below 100 mg/L in September 2016; both have continued to decrease in 2019 to below 30 mg/L. The Well RW-A field pH shows an overall decreasing trend from 2013 to 2014 but had been relatively stable around pH 6 during 2015 and 2016. During 2017, the decreasing trend was re-established, with monthly field pH measurements dropping below pH 6. During 2019, the field pH values fluctuated but were stable within a range of about 0.8 pH units, with a gradual increasing trend during the latter part of 2019 and one result above pH 6 (October 2019). Well NBL-02 continues to monitor background water quality; bicarbonate has decreased (with fluctuations) from a high of 419 mg/L in 2011 to about 300 mg/L and remained stable in 2018. In 2019, the field bicarbonate concentrations remained fairly stable ranging from 268-318 mg/L.

Monthly field parameter measurements made in the NW-series of wells and Well MW-7 (Table 12) provide the northernmost information on water quality. NW-1 (parameters could not be collected after May 2019 due to a lack of water) and NW-4 are the easternmost of the NW-series wells and NW-3 and NW-5 are the westernmost; wells NW-2 and MW-7 are the northernmost wells where monthly field parameters were collected. Seepage-impacted water is typically more prevalent towards the eastern limit of saturation; to the west the prevalence of background water increases as does the formation's saturated thickness. The following summarizes the interpretation of monthly field parameter data for the NW-series wells and Well MW-7:

- Well NW-1 (not pumped since May 2012) was the most seepage-impacted until it began improving after September 2011 and is now considered to represent mostly background water. However, field and laboratory bicarbonate concentrations have decreased, on average, in recent years. During the period between November 2017 and October 2018, the bicarbonate decreased to a low of 256 mg/l in August 2018, then increased to 346 mg/l in December 2018. The 2018 range of laboratory bicarbonate concentrations was 323 to 370 mg/l (no lab testing was performed in 2019 due to a lack of sample volume). The 2019 (January to May) field pH fluctuated between 6.61 and 7.56 pH units.
- Well NW-4 (a seepage-impacted, very low flow-rate extraction well from which pumping was suspended in October 2015) showed somewhat less seepage impact than NW-1 until impact increased, beginning in September 2011. The NW-4 field bicarbonate concentration increased in November 2013 (200 mg/L) and has since decreased; the range during the November 2018 to October 2019 monitoring period was 0 mg/L (November 2018) to 22 mg/l (May and June 2019). Field

pH measurements fluctuated during the November 2018 to October 2019 monitoring period (ranging from 5.02 to 6.53 units) but were generally slightly lower than the 2018 monitoring period.

- Well NW-2 (an extraction well) had shown little seepage impact through 2013. However, seepage impacts increased in 2014 through 2019 (reflecting a slight shift in seepage impacted water to the west or north as a result of the pumping). The 2019 NW-2 results indicate the continuation of a very slow decreasing trend in bicarbonate that has reached "full seepage impact" (the field bicarbonate concentration reached a minimum of 12 mg/L in October 2019 [Table 12]; the range of the four quarterly laboratory bicarbonate results was 67 mg/L in January to non-detected in October 2019 [Appendix B; Table B.1]). The pH range (4.56 to 5.85 units) was slightly lower than the prior year.
- Wells NW-3 (not pumped since 2009) and NW-5 (pumping initiated during March 2016) have been historically interpreted as predominantly background water. They also have had greater saturated thicknesses than other NW-series wells. During the current November 2018 to October 2019 monitoring period, NW-3 field measurements showed some variability in field pH (6.89 to 7.45) and bicarbonate concentrations (347 to 536 mg/l). These results for NW-3 are consistent with the interpretation of predominantly background water. NW-5 field measurements had indicated decreasing bicarbonate concentrations and decreasing pH, trends that accelerated after pumping was initiated in March 2014 and continued into the 2019 monitoring period. NW-5 field bicarbonate measurements have followed an overall decreasing trend (from a high of 627 mg/L in March 2011 to a low of 9 mg/L in August 2018. Subsequent field bicarbonate concentrations have been slightly higher; the 2019 concentration range was 18 mg/L to 97 mg/L. The NW-5 field pH measurements have followed a similar trend: pH decreased from 6.95 in November 2015 to 4.80 in August 2018 (with a low of 4.52 units in April 2018) but increased in September (5.52 units) and October 2018 (5.86 units) and had a 2019 range of 5.04 to 6.02 pH units. The overall decreasing trends seen in 2018 are interpreted to be the result of an increasing fraction of seepage-impacted water captured by pumping, whereas the recent increases may represent a shift in the capture area.
- Well MW-7 is considered partially impacted. The MW-7 bicarbonate concentration has followed an overall decreasing trend (from 416 mg/L in December 2013 to 193 mg/L in October 2019 [with a low of 177 mg/L in March 2019]). The bicarbonate concentrations appear to gradually decrease over time. The MW-7 field pH fluctuated between 6.24 and 7.47 in 2019, similar to that reported during the previous monitoring period.

Figure 35 shows the northern edge of the seepage-impact front during October 2019 to be adjusted with respect to that depicted in the 2018 to encompass both Wells NW-5 and NW-2 (now considered "fully seepage-impacted based on an October field bicarbonate concentration of 12 mg/L) and continue to adjoin Well MW-6. NW-1 remains outside the seepage-impacted area. This is consistent with previous determinations of the seepage front extent over the past several years (e.g., Chester Engineers, 2016), which have focused on "full seepage impact" – defined as bicarbonate concentrations at or below 50 mg/L. NBL-01 was historically identified as the "end point well" of full seepage impact, which was appropriate given the very low field pH and bicarbonate concentrations of 0 mg/L. However, reductions in saturated thickness in the northern Zone 3 area have caused fewer wells to be available for sampling, which increased the reliance on historical samples (see Tables 11 and 12) that may not reflect current conditions. Additionally, field measurements have not been made at NBL-01 since February 2013, due to a sharp decrease in the well water level and an accumulation of sediment at the bottom of the well. The current position of the downgradient seepage extent accounts for the impacted water quality at pumping Wells NW-5 and NW-2. The seepage front line adjoins Well MW-6 (last sampled for field parameters in September 2015) as it has in previous years.

In summary, the 2019 water quality data in northern Zone 3 varied slightly with respect to 2018. Although the seepage-impacted water historically observed at NBL-01 just to the south has not "broken through" to the north, extraction Well NW-2 appears to have become fully seepage-impacted, which has justified a slight shift in the mapped position of the downgradient extent of seepage impacts. It is anticipated based on current concentrations that seepage-impacted water will continue to be retarded by pumping from Well NW-5 (to the degree pumping can be maintained).

EPA (2003) previously presented two sets of Stiff diagrams to evaluate geochemical data with respect to Zone 3 seepage impacts: (1) one set that showed EPA 14 in annual "snapshots" of water quality from October 1998 through October 2002 (these were also presented in GE, 2012b) and (2) a second set that presented Stiff diagrams for ten Zone 3 wells based on the October 2002 sampling (also presented in GE, 2012b). This information is considered with more recent geochemical data with respect to seepage impact classification and progression below. Additional details regarding these analyses are presented in previous annual reports (e.g., Chester Engineers, 2016, 2017).

- Well EPA 14 is fully impacted by tailings seepage, as exhibited by bicarbonate and metals concentration trends (see Appendix B; Table B.1) but has shown some periodic variability interpreted to represent background water incursion. Stiff diagrams for Well EPA 14 in the annual water quality "snapshots" for October 1998 through October 2002 (EPA, 2003) show that before October 2000, the calcium-to-magnesium (Ca/Mg) ratio was greater than one and the earlier bicarbonate concentrations were consistent with background water quality but later became elevated (see Figure 39). From October 2000 to October 2002, the Ca/Mg ratio was less than one and bicarbonate became depleted. Modest exceedances of the aluminum and cobalt ROD standards in Well EPA 14 began in 2000, when the bicarbonate concentration decreased suddenly and sharply. Figure 40 shows that the bicarbonate at this location fell sharply to non-detect (zero) in July 2001, then increased to 188 mg/L in October 2004, and then fell to non-detect again in October 2006; this is interpreted as due to occasional mixing with background water (which is presently located nearby to the west; see Figure 35 in this report). Between October 2006 and October 2014, bicarbonate concentrations at EPA 14 remained at or very near non-detect levels. During 2015, bicarbonate concentrations and pH values increased (pH maximum 6.70 units, bicarbonate maximum 91 mg/L) during the January to July period (indicating some proportion of mixing with background water) but decreased again in October 2015 to values indicative of greater seepage impact (pH 4.47, bicarbonate <5 mg/L). Bicarbonate values remained below the detection limit in all samples until October 2017 (5 mg/L), this result that was equal to the detection limit and originally considered unreliable because it was qualified (holding time exceedance and detection in the laboratory method blank), which was the beginning of a slightly increasing trend that reached 143 mg/L in October 2019. The October 2019 field pH (5.65) increased slightly from October 2018 value (5.55) and the Ca/Mg ratio increased to approximately 1.1 during 2019. Bicarbonate concentrations increased steadily from 56 mg/L in January 2019 to 143 mg/L in October 2019.
- The first chemical measurements in Well NBL-01 were made in August 2001 (Appendix B), when the calcium-sulfate type of water was representative of background water quality. Subsequently, early stage seepage impact was shown by the gradual reduction of the Ca/Mg ratio from 2001 through October 2005 (Appendix B) and the beginning of decreasing bicarbonate concentrations around April 2004 (Appendix B, based on laboratory determinations of bicarbonate) and June 2004 (Table 11, based on field determinations of bicarbonate). Starting in January 2010, NBL-01 showed decreases in Ca/Mg ratio (0.80 in last analysis in January 2013) and significant increases in metals concentrations; full seepage impacts were subsequently indicated by the 2012 and January 2013 bicarbonate non-detects and pH values frequently less than 4 (although approximately 100 ft to the northeast at MW-6

[last sampled for full laboratory analysis in July 2014], the water quality in the most recent samples was notably better). It is also notable that the groundwater chemistry degradation in NBL-01 coincided with, and may be associated with, declining saturated thickness (i.e., consistent with the hypothesis developed by NRC, 1996). These closely spaced, large variations in groundwater quality are attributed to the effects of extraction well pumping in their vicinity, which causes variations in the proportion of seepage-impacted versus non-seepage-impacted water that reaches the wells. Monitoring of the northernmost part of Zone 3 in Section 36 indicates that this area is a complex zone of mixing of background and seepage-impacted water, rather than a singular advancing plume edge with a "sharp line" boundary.

- Invariably, some wells (or certain time spans at some wells) are difficult to classify because their groundwater chemistry tends to be gradational. For example, the geochemistry associated with Well 420 has long been considered "borderline" between background and seepage-impacted water quality which is consistent with its location between the area of formerly perennial alluvial recharge and that of tailings seepage. It is notable that the Well 420 water level was below the bottom of the screened interval for samples collected after January 2017 (there is a 5-ft section of blank well casing below the well screen); therefore, the reliability of these samples is suspect. The Stiff diagram and recent samples from this well, located along the western edge of the seepage-impacted area in Figure 35, indicate a calcium-sulfate type of background water. Bicarbonate concentrations in Well 420 samples suggest mixing of seepage-impacted water with background water but have remained in the background range. Over the one-year period from April 2006 to April 2007, bicarbonate dropped from 781 mg/L to 237 mg/L but subsequently increased and has been since following a fluctuating, slowly decreasing trend (Figure 40). The bicarbonate concentration in April 2015 fell below 400 mg/L for the first time since April 2007 and has remained there through the sample collected in October 2019 (260 mg/L). Historical data for other analytes (notably sulfate, uranium, and molybdenum) have been interpreted as indicating that the groundwater quality in the vicinity of Well 420 is "borderline" between background and seepage-impacted, that the seepage-impacted region is nearby, and that the groundwater quality may be degrading very gradually or has stabilized (Chester Engineers, 2017).
- Well 717, near the western edge of the seepage-impacted area in Figure 35, provides a third example of a calcium-sulfate type of water that was interpreted as predominantly background (largely non-seepage-impacted) in 2002 but subsequently became increasingly impacted. Starting during 2006, concentrations of several metals and gross alpha activity have increased. Constituents that exceeded NRC license standards and/or revised EPA cleanup levels during 2019 included aluminum, beryllium, cobalt, manganese, nickel, selenium (total, but not Se(IV]) and uranium. A sharp decline of bicarbonate from July 2002 (740 mg/l) to January 2009 (non-detect) is similar to that observed in Well EPA 14 (see Figure 40) and is interpreted to represent exhaustion of the local buffering capacity. The bicarbonate concentrations have remained non-detected for 2019. The comparative water quality of 717 and EPA 14 are discussed further in Section 3.3.4.

The other seven wells depicted with Stiff diagrams (EPA, 2003, Figure 6-8) represent seepage-impacted magnesium-sulfate types of waters. For example, in October 2019 (see Appendix B; Table B.1) upgradient Well 613 (in the southwestern part of the seepage-impacted area shown in Figure 35) showed high sulfate concentrations (2019 range: 7,800 – 8,600 mg/L), a Ca/Mg ratio less than 0.5, non-detected bicarbonate, a very low field pH (2.98 units in October), and exceedances of NRC license standards or revised EPA cleanup levels for many parameters, including TDS, sulfate, aluminum, beryllium, cobalt, manganese, nickel, selenium (total, but not Se(IV]), vanadium, uranium and thorium-230.

The October 2019 annual samples from extraction Wells RW-A and RW-11 indicate that these wells have become increasingly seepage-impacted (Appendix B; Table B.1). Well RW-A shows a stabilized

bicarbonate concentration trend (range: 25-29 mg/L in 2019); RW-11 bicarbonate concentrations have decreased since 2008 but may have stabilized (117 mg/L in October 2019). Well RW-11 is only sampled on an annual basis. Both wells have increasing TDS and sulfate concentrations, Ca/Mg ratios below one, and fluctuating pH indicating that neutralization capacity is available but is being depleted and/or there continues to be mixing with background water. Well RW-A data from October 2014 showed increases in metals and radionuclides, including aluminum, beryllium, lead, combined radium, thorium-230, Pb-210; all these concentrations subsequently decreased and remained at lower concentrations during 2019. However, the RW-A cobalt concentrations in annual analyses from October 2016 to October 2019 exceeded the revised EPA cleanup standard. Well RW-11 has shown recent increases, but very little change compared to 2018 samples in several metals and radionuclides (including magnesium, cobalt, manganese, nickel, combined radium, Pb-210 and gross alpha) most of which began to stabilize as of 2018.

With respect to the currently operating Zone 3 pumping containment remedy, observed changes in saturated thickness, water quality, and seepage impact extent in northern Zone 3 and reductions in pumping capabilities over time indicate that the northern Zone 3 remedy may be reaching its practicable limits. EPA anticipated this in the ROD (EPA, 1988b) in stating that, in event that saturated thicknesses cease to support pumping, remedial activity would be discontinued or adjusted to appropriate levels. EPA (1988b) also stated that it may be technically impracticable to achieve all cleanup levels in a reasonable time period, such that waivers to meeting certain constituent-specific ARARs may be required. Additionally, in the most recent Five-Year Review, EPA (2018) has acknowledged the technical difficulties of achieving Site groundwater cleanup levels using engineering controls and that institutional controls (ICs) may need to play a larger role in protecting human health. UNC installed three monitoring wells north of Section 36 (Appendix B; Figure B-2) between December 2019 and January 2020 that are intended to support the adoptions of waivers, alternate standards or other administrative controls to close the corrective action program.

3.3.3 Rate of Seepage Migration

Table 13 summarizes the key factors, locations, and criteria underpinning the past calculations of northward seepage travel times for Zone 3. During the period from 2003 to 2008, the northern seepage front was inferred to have advanced from Well PB-02 to Well PB-04, receded as a consequence of pumping of RW-11, RW-12, RW-13, and PB-02 (see N.A. Water Systems, 2007a), and then advanced to PB-04 again. The repeated advance, covering the same ground locations, reflects the pumping-related hydraulic "tug of war" occurring in the vicinity of the northern tracking wells. With the advent of pumping from the northern, NW-series extraction wells in February 2009, the older northern tracking wells became subject to influences from both upgradient and downgradient extraction wells. The purpose of the upgradient wells (i.e., the RW-series wells RW-A, RW-11, RW-16, and RW-17) is primarily to dewater and recover contaminant mass, while the purpose of the downgradient wells (i.e., the NW-series, of which only NW-5 is operating as of November 13, 2019) is to form a hydraulic barrier. In so doing, these wells have also drawn the seepage front into their capture zones. The original purpose of calculating seepage-impact migration velocities for Table 13 equivalents, as a basis of predicting the progression of the impact reaction front, has been rendered moot by the designed actions of these extraction wells. Therefore, Table 13 has been included for reference but has not been updated for this report.

As described in Section 3.3.2, Figure 35 shows the position of the northern edge of the seepage-impact front during October 2019 has been adjusted from that shown in 2018 to encompass both Well NW-5 and Well NW-2, the latter of which became fully seepage-impacted during 2019. The seepage front line

adjoins Well MW-6 (last sampled for field parameters in September 2015) as it has in previous years. Field bicarbonate and pH measurements at Wells MW-6 and MW-7 show that there likely has been some mixing with seepage-impacted water. However, the pH at both wells has been above 6 units. These data are interpreted to indicate that the highly impacted water just to the south has not "broken through" to the north and that northward flow of seepage-impacted water was retarded by pumping from Wells NW-2 and NW-5 in 2019. Extraction from well NW-2 was suspended on November 13, 2019, due to a decreased water level and insufficient recharge, and is unlikely to be restarted. Bicarbonate concentrations in MW-6 were below 200 mg/L for most of the period from early 2013 to mid-2015 and appeared to have a slightly increasing trend when last sampled (224 mg/L in September 2015), but earlier full analytical data (July 2012 to April 2014) indicates Ca/Mg ratios below one. The MW-7 field bicarbonate concentration has also followed an overall decreasing trend since December 2013 (from 416 mg/L to 156 mg/L in October 2019); the Ca/Mg ratio has declined over time to a level below one (0.87) as of October 2019. It is anticipated based on current concentrations that seepage-impacted groundwater will continue to be retarded by pumping from Well NW-5 (to the degree that pumping can be maintained).

3.3.4 Natural Attenuation System Performance Evaluation

The Zone 3 natural attenuation system comprises the hydro-geochemical interactions between the bedrock matrix, the anthropogenic background waters (derived from former groundwater discharge associated with historical mining operations that ceased in 1986), and the tailings fluids. The natural system is attenuating the seepage impacts by the processes of neutralization, precipitation, adsorption, and mixing with the background waters.

Natural geochemical processes slow the migration of constituents associated with the acidic seepage in Zone 3 (as in the Southwest Alluvium and Zone 1). These processes neutralize the acidic seepage, which causes the precipitation and adsorption of metals and radionuclides. Evidence of this neutralization process includes: (1) an overall increase in pH and corresponding decrease in concentrations of metals and radionuclides with increasing distance from the source area; and (2) gradual increase in bicarbonate for a few years followed by dramatic decreases. Shutoff of the remaining Stage II wells in 2000 enhanced the effectiveness of the natural attenuation processes in many parts of the seepage-impacted area.

The impact of natural attenuation of seepage impacts by geochemical processes for individual constituents in Zone 3 is discussed below (see Table 14 and Appendix B; Table B.1).

3.3.4.1 Sulfate and TDS

Sulfate and TDS are non-hazardous constituents and not regulated by NRC. Figure 41 is a graph of sulfate concentrations from 1989 through October 2019. Concentrations are relatively high closest to the tailings impoundment and Well 613 is the only monitoring location where sulfate concentrations (7,910 mg/L in October 2019) and TDS concentrations (10,700 mg/L in October 2019) exceed the revised EPA cleanup standards. The sulfate concentration in Well 613 fluctuates but appears to be gradually decreasing. As in the Southwest Alluvium, sulfate concentrations are controlled by geochemical equilibrium with gypsum (or anhydrite) and calcite. Although very high sulfate concentrations were present in the tailings fluids, such sulfate concentrations attenuate rapidly downgradient due to precipitation of gypsum. Earth Tech (2002c, Figure 3-13) demonstrated that sulfate concentrations decreased by about 85 percent between the North Cell and the seepage-impacted water at Well 613 via precipitation of gypsum (the saturation index of virtually all water samples with respect to gypsum hovers around unity). Moreover, there is a complete overlap between the range of sulfate concentrations in seepage-impacted and background water (except for Well 613). Slightly increased concentrations in recent samples from certain monitoring

locations (e.g., Wells 717, 719, EPA 13 and MW-7) suggest slightly increasing concentration trends, but most of these concentrations are within or near the historical concentration range. The sulfate concentration in well 711 gradually increased in 2019 from 3,480 mg/L in January to 3,800 mg/L in October. EPA Well 13 shows that between 2018 and 2019 sulfate concentrations have more or less stabilized. Overall, the marked stability of sulfate in almost all wells, throughout the duration of remedial pumping and in the absence of such pumping, demonstrates that sulfate concentrations are determined exclusively by the geochemical equilibria between natural minerals and waters rather than remedial operations.

Figure 41 shows that sulfate concentrations at Well EPA 14 have fluctuated significantly since 2000 and over a range of 1,670 mg/L to 4,520 mg/L since April 2013. Well EPA 14 is known to have become seepage-impacted in 2000; this being the main basis upon which NRC and EPA agreed to suspend pumping in the downgradient Stage 2 extraction wells (because the wells pulled seepage-impacted water further westwards). In 2019, the sulfate concentrations in EPA Well 14 ranged from 2,650 mg/L to 3,730 mg/L. These concentrations, along with the observed periodic variability in the sulfate concentrations are interpreted to reflect chemistry changes related to background water incursion into the seepage impacted area.

3.3.4.2 Metals

UNC has presented information demonstrating that certain metals exceeding historical standards (e.g., arsenic and molybdenum) were primarily found in background water (e.g., Chester Engineers, 2015a). The revised background standards have lessened one of technical impediments (GE, 2009) to eventual Site closure which stated that "long-term monitoring data and basic geochemical considerations reveal some cleanup objectives to be unattainable." For most parameters, the establishment of BTVs through statistical analysis will incorporate and account for the geochemical influence on groundwater quality and facilitate the identification and assessment of contaminants of concern.

Figures 42A and 42B are time-series graphs of concentrations of selected metals in Zone 3 monitoring wells (the metals uranium and vanadium are discussed later with the radionuclides). There were no exceedances of the revised standards for cadmium or molybdenum during 2019, but charts for these analytes are included because they were included in previous years. POC Well 613 is located near the center of the seepage-impacted area, closest to the source area, where field pH has ranged from 2.76 to 3.24 since this well was first monitored in 2000. This well shows the highest metals concentrations during the October 2019 monitoring event for aluminum, cadmium, cobalt, manganese, nickel and selenium (total). Figure 43 is a map showing the extent of aluminum concentrations exceeding 5 mg/L (the EPA cleanup standard) based in the October 2019 monitoring event. This map distribution pattern has been approximately constant over time (with the exception of the area around well EPA 14, for which the October 2019 aluminum concentration dropped below 5 mg/L and the area near NW-5, which was sampled for the full parameter list for the first time in 2019), regardless of an active remedy or not. The map illustrates that the distribution of aluminum exceedances was largely restricted to the southwestern part of the seepage-impacted area. The 5 mg/L contour position has been slightly adjusted from that shown on the October 2018 map to reflect the lower aluminum concentration in the EPA 14 sample (13.9 in 2018 and 2.2 mg/L in 2019). An isolated outlying area of elevated aluminum concentrations also depicted to the north encompassing Well NW-5 (9.4 mg/L, Well NW-5 was not represented in previous versions of the aluminum map). However, similar isolated outlying areas of elevated aluminum concentrations have previously been depicted in the vicinity of Wells PB-04 and PB-03 (both of which were last sampled for the full laboratory chemical list in October 2013), NBL-01 (last sampled in January

2013) and extraction Well RW-A (7.8 mg/L, October 2014); RW A aluminum concentrations subsequently decreased; the October 2019 RW-A result is shown on Figure 43 is 0.29 mg/L).

Aluminum, manganese, cobalt, beryllium, and nickel exhibited the most frequent exceedances of NRC license standards and/or revised EPA cleanup standards in samples from monitoring wells within the highly seepage-impacted area (i.e., Wells 517, 613, 708, 711, and 717) during October 2019. The NRC license standard for beryllium (0.050 mg/l) is higher than the EPA cleanup standard (0.004 mg/l); beryllium exceedances at some monitoring locations exceeded only the EPA standards, others exceeded both standards (Table 14 and Appendix B; Table B.1). Well EPA 14 (which was in the highly seepage-impacted area in 2015 but has had a higher pH in subsequent years [5.65 in October 2019]) had only an exceedance of the EPA cleanup standard for beryllium in October 2019. There were no 2019 exceedances in samples from other seepage impacted or partially-impacted wells (Wells 420, 719, EPA 13, NW-5, RW-11, and RW-A) except for aluminum exceedances in Well 719 (April 2019; 5.5 mg/L) and NW-5 (October 2019; 9.4 mg/L), an arsenic (total) exceedance at EPA 13 (April 2019; 0.828 mg/L) and cobalt exceedances at Wells NW-5 (October 2019; 0.44 mg/L) and RW-A (October 2019; 0.403 mg/L) in October 2019 (see Table 14 and Appendix B; Table B.1). It is noted that the EPA 13 total arsenic concentrations were below the standard in the July and October 2019 samples and the corresponding As[III] results for all four quarters were all below the NRC standard (maximum 0.016 mg/L, see Appendix D).

Outside the seepage impacted area, there were no exceedances in samples from Wells NBL-02 or MW-7. Unusually high arsenic (total) concentrations exceeding the NRC license standard were detected in background Well NW-3 during 2019 (range 9.51 to 10.4 mg/L) (see Table 14 and Appendix B; Table B.1). The reported 2019 As(III) concentrations were also unusually high, but the range (1.6 mg/L to 7.7 mg/L) was slightly lower (see Appendix D) and similar to the As(III) concentrations reported in 2018 (range 0.98 to 6.2 mg/L). The NW-3 concentrations are considered to be related to background groundwater chemistry (e.g., see Chester Engineers 2015a); similar notable exceedances (maximum 2.5 mg/L) were historically reported in nearby Well NBL-01 from 2002 to 2008, under both background and partially seepage-impacted conditions. The NBL-01 arsenic concentrations were typically lower under "full seepage-impact" conditions. The reported NW-3 arsenic concentrations may be associated with declining saturated thickness and the increasing exposure of coal (and possibly pyrite) in the in the lower part of Zone 3 to oxygen.

The depletion of neutralization capacity has stabilized the concentrations of metals at higher levels in some wells. For example, concentrations of beryllium, cadmium, cobalt, nickel, manganese, and aluminum stabilized at elevated levels in Well 717 between October 2008 and July 2009. This commenced as bicarbonate concentrations approached non-detect levels in October 2008 (and remained non-detect after January 2009). The same process occurred earlier in Well EPA 14, which is 330 ft upgradient of Well 717. The concentrations of most metals increased in Well EPA 14 after May 2000, when bicarbonate concentrations declined precipitously (Figure 39). Since October 2017 the bicarbonate concentrations have been gradually increasing (5 mg/L in July 2017 to 143 mg/Lin October 2019). The concentrations of these metals stabilized after July 2006, when the neutralization capacity was exhausted (as evidenced by the typical absence of detectable bicarbonate). However, from January to July 2015 and again from October 2017 to October 2019 metals concentrations decreased in response to increased bicarbonate concentrations (and pH values), indicating some proportion of mixing with background water.

The comparison of total arsenic and selenium results to the speciated results in Zone 3 indicates that total concentrations are generally similar to, or higher than, speciated concentrations (Appendix D; Table D.1). Notable differences between total and speciated concentrations were identified for both arsenic and selenium at Zone 3 wells. For example, the April 2019 sample from seepage-impacted Well EPA 13

exceeded the NRC and EPA standard and, although later sample concentrations were below the standards, all samples were elevated in comparison to As(III) concentrations. Selenium (total) exceedances occurred only at two seepage-impacted locations where Se(IV) concentrations were below the standard, but where other analytes also exceeded standards. Overall, the reported total arsenic and selenium concentrations do not significantly change conclusions about the Site remedy made in recent years. UNC will continue to evaluate total arsenic and selenium concentrations and speciated concentrations, where warranted, during the 2020 monitoring events and reassess the analytical program in the 2020 Annual Review Report.

3.3.4.3 Uranium, Vanadium, and Radionuclides

Figure 44A presents graphs of the uranium and vanadium concentrations and combined radium and thorium-230 activities from 1989 through 2019. Combined radium activities have been previously demonstrated to exceed the historical NRC/EPA standard (5 pCi/L) in Zone 3 background water (e.g., in NBL-01 and NW-3 samples; Chester Engineers, 2015a). In 2019, there were no combined radium exceedances in any of the zone 3 wells sampled.

Historically, uranium, vanadium, and thorium-230 have been present above the standards in Well 613, which has an acidic pH (field pH 2.98 in October 2019) and is closest well to the source in Section 2. Downgradient within the highly seepage-impacted area toward the northeast, natural attenuation (neutralization, adsorption, or possibly precipitation) reduces the concentrations of these three constituents (e.g., in Well 708 [field pH of 3.75 in October 2019]). Accordingly, much lower concentrations are reported where the pH is more neutral. In the 2019 monitoring events, exceedances of NRC and/or revised EPA cleanup standards were reported for thorium-230, uranium, and vanadium in Well 613 for all four 2019 samples (Table 14 and Appendix B; Table B.1). Vanadium attenuates rapidly, such that it was not detected at any other locations in Zone 3. Uranium exceedances were also reported for all four 2019 samples from Well 717. There were no additional thorium-230 exceedances reported at any other Zone 3 monitoring location during 2019.

Figures 44B and 44C provide uranium isoconcentration maps from October 2019 (Figure 44B, two alternative contour interpretations are shown) and October 2002. The source of uranium in both background and seepage-impacted water in Zone 3 was not tailings seepage, but mine water, permitted to contain uranium concentrations up to 2 mg/L, discharged to Pipeline Arroyo for 17 years. Uranium has been historically detected at relatively elevated concentrations in both background and highly seepage-impacted wells. Over the longer term, uranium at Well 613 within Section 2 shows an overall decreasing trend that has been below 1 mg/L since January 2014. Just outside Section 2, uranium concentrations have followed an overall increasing trend in Well 517 but appear to have stabilized below the NRC/EPA standard (0.395 mg/L). Farther downgradient outside Section 2, uranium in seepage-impacted water typically attenuates such that the range of uranium concentrations in Zone 3 background water is higher than the range in seepage-impacted water (N.A. Water Systems, 2008e, 2008f). Among the historical evidence that uranium concentrations in background can exceed those in moderately seepage-impacted water was that NBL-01 had a higher uranium concentration in October 2002 (Figure 44C, 0.251 mg/L) under background conditions (seepage impact reached this well in January 2004) than most subsequent samples under moderately seepage-impacted conditions.

Uranium concentrations at Well 717 along the northwestern edge of the seepage-impacted area have shown an increasing trend since 2013 (to a January 2019 maximum concentration [0.808 mg/L] shown on Figure 44A, with a slightly lower concentration reported in the October 2019 sample [0.714 mg/L]) during a period where seepage impacts have been sustained or increased, as evidenced by pH values less than 4

and increasing metals concentrations (see Appendix B; Table B.1). The observed uranium concentration variability is attributed to geochemical reactions occurring in the areas where seepage impacted water and background water interact such as where groundwater is transitioning from one type to the other.

The water chemistry along the contact between seepage-impacted and background water from Well EPA 14 to Well 420 (including Well 717) varies significantly over a very short distance (see Figures 35 and 43) and is subject to local redirection of groundwater flow by extraction Well RW-16 (and to a lesser degree Wells RW-17 and RW-11). Similar uranium concentration increases to that seen in Well 717 have previously occurred at other locations where seepage-impacted water is proximal to background water and/or where active pumping was drawing both background and seepage impacted water (e.g., Well EPA 14 [July 2004 to January 2005, maximum 1.05 mg/L], Well NBL-1 [January 2013, maximum 0.458 mg/L], and PB-04 [October 2013, 0.535 mg/L]). In some cases, the complex geochemistry at the reaction front has yielded unusual results (e.g., precipitation of amorphous aluminosilicates at EPA 14).

In previous annual reports (e.g., the 2014 Annual Report [Chester Engineers, 2015a]), the uranium isoconcentration contour pattern along the northwest part of the plume (approximately from Well 717 to NBL-01; including Well 420) was interpreted to show the effect of background water being drawn in, from west to east, to seepage-impacted water, under the action of former and current pumping. The two 2019 alternative maps in Figure 44B are provided (slightly different than they were in 2018) due to the uncertainty associated with the substantial water chemistry variability along the contact between seepage-impacted and background water, as well as the limited uranium data in the center of the seepage-impacted area. The Well 717 uranium concentration is likely to be a local effect of the seepage-impacted/background interaction as represented by the contours shown in Alternative 1. Alternative 2 provides for an alternative interpretation relating the Well 717 uranium to the most acidic seepage-impacted water, based on the low pH values observed at the well.

Interpretations of uranium concentrations (and groundwater chemistry in general) are likely to remain dynamic in this area as saturated thicknesses decline and groundwater flow directions vary due to extraction well pumping along the contact between different water types.

The historical Zone 3 gross alpha data indicate that this parameter tends to fluctuate and can exhibit significant exceedances of the NRC license standard/revised EPA standard (39.7 pCi/L) in seepage-impacted wells. During 2019, the standard was only exceeded in one sample (April 2019) from well NW-3, which is interpreted to monitor predominantly background water (Appendix B; Table B.1).

3.3.4.4 Total Trihalomethanes (TTHMs)

Prior to the fourth quarter 2006, the TTHMs concentration shown in Appendix B equaled the chloroform concentration (i.e., chloroform is the only TTHM compound analyzed). Starting with the October 2006 sampling event, the TTHMs concentration represents the sum of the four component compounds (of which chloroform is one). Almost all Site groundwater samples show that the TTHMs concentration equals the chloroform concentration (i.e., chloroform is the only TTHM compound present). There were no TTHM concentrations detected above the NRC license standard and/or revised EPA standard (NRC/EPA standard, 80 µg/L) in samples collected during 2019 (Table 14 and Appendix B; Table B.1).

Historical TTHM concentrations in Well 613 have exceeded the NRC/EPA standard in most samples since October 2002, consistent with this well's proximity to the tailings source (see Figure 35). Well 613 concentrations have shown long-term fluctuations but increased by a factor of four from July to October 2002. Since then the concentrations have shown relatively large fluctuations that are superimposed on an

overall decreasing trend since 2012. TTHMs were detected during 2019 at concentrations below the NRC/EPA standard in samples from Wells 517, 613, 711 and 717. Low concentrations of TTHMs have been detected in almost all Well 517 samples since 1991. TTHMs had been regularly detected at Well EPA 14 from October 2006 to April 2013 but have not been detected in subsequent samples. Chloroform was first detected in Well 717 in July 2008, and beginning in October 2010, was detected at very low concentrations for 27 consecutive quarters through April 2017 (except for the primary samples (of sample-duplicate pairs) collected in October 2015 and January 2016, see Appendix B). TTHMs were detected in all the 2019 Well 717 samples except the April and October primary samples (<0.5ug/L). Sample duplicate pairs were collected from Well 717 in all four 2019 sample events. These results support the inference that fully seepage-impacted water has migrated downgradient to 717. Wells 106 D and 518 also consistently showed chloroform detections until they ceased being sampled in 1991 and 2000, respectively (Appendix B; Table B.1). Other Zone 3 wells have shown, with very few exceptions, historical non-detects for chloroform and, since the fourth quarter of 2006, for TTHMs. This indicates that chloroform is attenuated by degradation, dispersion, and dilution, to levels that are generally non-detect but are otherwise always far below the NRC/EPA standard (which is equivalent to the primary drinking water standard).

3.3.4.5 Pb-210

Table 14 shows that Pb-210 was detected in samples from four wells (517, 708, 717, and NW-5) during the October 2019 monitoring event. All of the 2019 detected results were below the NRC license standard and EPA cleanup standard (5.7 pCi/L; see Appendix B; Table B.1). The 2019 detections are not inherently indicative of impact from the tailings seepage; the maximum activity reported during 2019 was 2.1 pCi/L (April and October samples from Well 717) and all detected activities fall within the lower half of the range of 1 to 11 pCi/L defined by the minimum and maximum values associated with background water (N.A. Water Systems, 2008e, Table 5).

3.4 Efficiency of Seepage-Impacted Groundwater Removal by Pumping

The Zone 3 pumping efficiency is declining with time. As Zone 3 pumping continues, more background water flows eastward to replace (and possibly mix with) the seepage-impacted water volume removed by pumping, resulting in a lower pumping efficiency. This process of inducing progressively more background water will lead to increased concentrations of uranium, and other parameters (e.g., molybdenum has been detected at significantly higher concentrations in background compared to seepage-impacted water).

All Zone 3 pumping well capacities decline over time. One important cause is loss of saturated thickness. UNC asserts that overall conditions are such that active remedial operations in Zone 3 are reaching the limits of their effectiveness. This is demonstrated by significant annual reductions in pumping volumes (the total 2019 pumped volume [365,784 gallons] was 30 percent less than that in 2018). As a result, continued operation will be met with diminishing returns, and/or will adversely affect groundwater quality in some ways as was seen more than a decade ago with the former pumping system. Additionally, extraction from well NW-2 was suspended on November 13, 2019, due to decreased water levels and insufficient recharge and is unlikely to be restarted. It will not be possible to pump out all of the seepage-impacted water. Seepage removal efficiency will be considered in the SWSFS as the means to evaluate the effectiveness of any proposed remedy alternatives utilizing pumping wells. Extraction wells having yields below the 1 gpm decommissioning criterion may be recommended to NRC for decommissioning in a future license amendment request.

4 Zone 1

4.1 Corrective Action Summary

Zone 1 corrective action consisted of source remediation (neutralization and later dewatering of Borrow Pit No. 2) and pumping of a series of extraction wells from 1984 through 1999 (Earth Tech, 2002c). Well productivity in this hydrostratigraphic unit had always been very low. Earth Tech (2002c, Figure 4-1) summarized the pumping program for Zone 1, including the well systems pumped, the number of wells operating for each system, and the combined annual pumping rates. A maximum combined pumping rate of 14 gpm was achieved by the 17 East and North Cross-Dike Pump-Back wells. The productivity declined steadily over time, and by July 1999, when the system was decommissioned, the three remaining wells were yielding a combined annual average of 0.65 gpm. The three remaining Zone 1 recovery wells (615, 616 and 617) were decommissioned at the end of July 1999 in accordance with a letter from NRC dated July 30, 1999 (Earth Tech, 2002a), with the concurrence of EPA.

UNC submitted to NRC a license amendment request (GE, 2015) and three subsequent communications that amended, corrected, and resubmitted the request (GE, 2016b; GE, 2017; GE, 2018) that sought to reconcile the license with recent corrective action programs advances and to recommend modifications to the performance monitoring program. For Zone 1, the license amendment request recommended the removal of Well EPA 02 and POC Wells EPA 04, EPA 05, and EPA 07, all of which are located outside Section 2 in Section 1. The license amendment request was supported by data from the previous sixteen years of post-shutdown monitoring, which indicated a gradual improvement in water from the Zone 1 POC wells (GE, 2015). UNC subsequently withdrew the resubmitted 2018 request (GE, 2019), pending action by NRC on another license amendment request related to the construction of a mine spoil repository on the tailings impoundments. UNC will reconsider making the license amendment request related to performance monitoring as the NRC action on the mine spoil repository amendment request proceeds.

4.2 Mass of Chemical Constituents Removed

The mass of chemical constituents removed was calculated for the 10-year period from July 1989 through July 1999. These calculations were presented in the previous annual reviews, and the final summary was presented in the 1999 Annual Review (Earth Tech, 1999).

4.3 Performance Monitoring Evaluation

4.3.1 Water Level Evaluation

The current water level monitoring component of the performance monitoring program comprises quarterly monitoring of water levels in 15 wells (Table 15) and has been in effect since the second quarter of 2000. Historical water level data for sampled Zone 1 wells through October 2019 are presented in Appendix C; Table C.1. Water levels for the fourth quarter of 2019 are shown on the potentiometric surface map in Figure 46. Water levels through time are shown on Figure 47.

Saturated thicknesses calculated from the October 2019 measurements in Zone 1 are presented in Table 16. This table shows that the Zone 1 hydrostratigraphic unit remains completely saturated in most of the down-dip wells: 505 A, 502 A, and 412 (in Section 36) and 142 and 143 (along the northern boundary of Section 36, see Figure 46). During 2019, most of the wells continued to show overall decreasing potentiometric elevations (Figure 47); changes of potentiometric elevations in up-dip and down-dip wells

indicate the broad pattern of the shift in the potentiometric field caused by groundwater drainage to the northeast in Zone 1. Figure 47 also indicates that the potentiometric levels in Wells 142, 143, and 412 (in the northern part of Section 36, where Zone 1 is fully saturated) reached a maximum and are slowly declining. Water level in Wells 501 A and 502 A are gradually decreasing and the water level in Well 504 A has been stable, with minor fluctuations since 2006.

Earlier groundwater flow in Zone 1 was approximately eastward, reflecting groundwater mounding and recharge from the borrow pits and the alluvium to the west. Since the dewatering of Borrow Pit No. 2 and termination of mine-dewatering groundwater discharge into Pipeline Arroyo, the former mounding has dissipated. Consequently, water levels in up-dip areas of Zone 1 (e.g., Wells 604, 614, and 515 A) have dropped significantly, though the rate of decline has reduced with the dissipation of recharge-induced mounding (see Figure 47). The rate of groundwater drainage is also limited by the unit's relatively low transmissivity, and the very low transmissivity of the underlying aquiclude.

UNC has submitted to NRC an ACL application for Zone 1 that presented a historical quantitative analysis of groundwater flow rates and directions (N.A. Water Systems, 2008g). In January 1983 the flow-direction azimuth (63°) had a strong easterly component and a calculated flow velocity of 93 ft/yr. During later time periods the flow azimuth gradually rotated to the north, resulting in an azimuth of 24° during October 2007 and had a calculated flow velocity of 40 ft/yr. These changes are a result of the formerly higher groundwater mound gradually continuing to dissipate over the years, the northerly dip of the Zone 1 sandstone has exerted greater control on the flow direction.

4.3.2 Water Quality Evaluation and Current Extent of Seepage-Impacted Water

The current water quality monitoring component of the Zone 1 performance monitoring program is summarized in Table 15 and comprises quarterly sampling in eight wells. Appendix C; Table C.1 provides historical constituent concentration data through October 2019 and Table 17 summarizes the constituents detected in Zone 1 during October 2019. These tables also include the Zone 1 NRC license standards and revised EPA cleanup levels to facilitate direct comparison with the groundwater data.

The temporary saturation created by the infiltration of former mine-dewatering groundwater discharges is considered the background water for Zone 1 (EPA, 1988b; 1998). This anthropogenic groundwater was later seepage-impacted by acidic seepage from Borrow Pit No. 2 in the Central Cell (compare Figure 2 and Figure 48). These seepage fluids contained elevated concentrations of metals, radionuclides, and major ions, including sulfate and chloride. Source remediation (neutralization and subsequent dewatering of the borrow pit, and capping of the Central Cell), continued neutralization of the seepage by natural geochemical processes, and mixing with the background water have reduced concentrations of most constituents below the NRC license standards and revised EPA cleanup standards (as well as historical standards). However, as discussed below, exceedances of some constituents may still occur in Zone 1.

It is important to realize that the historically reported exceedances of NRC license standards and EPA cleanup standards in some wells represent background water quality. For example, since 1989, background Well EPA 04 (in Section 1) had: (1) persistently shown exceedances of the historical EPA sulfate standard; (2) generally shown exceedances of the manganese ROD standard; and (3) shown concentrations of combined radium that have fluctuated above and below the ROD standard (5 pCi/L, which NRC revised in 2006 to 9.4 pCi/L [NRC, 2006] and subsequently revised to 12.1 pCi/L [both NRC and EPA]). Except for one combined radium in January 1993, these results are below the current NRC license standards and revised EPA standards that take background geochemistry into account. Background water quality is discussed further in Section 4.3.3 (Natural Attenuation System Performance Evaluation).

Water quality has improved since shutoff of the pumping wells, indicating that the degree of seepage impact is diminishing. Zone 1 seepage impacts have been delineated (Figure 48) by chloride concentrations greater than 50 mg/L (Earth Tech, 2000a). The extent of seepage impacts has diminished gradually over time (e.g., compare 2008 Annual Report Figures 48 and 49, which show that the area of seepage impact contracted from 2007 to 2008). The seepage impact boundary in the 2012 Annual Report (Chester Engineers, 2013) was extended to the north by approximately 250 ft in order to include Well 619 (Figure 48) after the October 2012 "spot" sampling of Wells 617 and 619. The 2012 boundary position has been maintained in the current report. Well EPA 05 has shown a long-term, gradual reduction in chloride concentrations from a maximum of 289 mg/L in April 1992 to 38 mg/L in October 2019 and has stabilized with minor fluctuations (only one result since April 2008 exceeded 50 mg/L – refer to Appendix C; Table C.1). Well EPA 07 chloride concentrations gradually increased for several years but stabilized and decreased in 2018 and remained approximately the same in 2019. Measurements exceeded the EPA cleanup standard (250 mg/L) in 2013 (one monitoring event), 2015 (three events), 2016 (one event), and 2017 (two events), but have since been below the standard. Chloride is a non-hazardous constituent and a secondary contaminant. The EPA cleanup standard for chloride derives from the New Mexico Water Quality Act; 250 mg/L is also the federal SMCL (this constituent does not have a federal primary MCL).

The zone of seepage impact has migrated predominantly toward the northeast and the north-northeast. Farther eastward, components of migration are limited by the proximity of the eastern edge of saturation. Figure 49 shows historical field pH values for Zone 1 wells through October 2019. Well 604 has persistently shown the lowest pH; as discussed below, it also is the most highly seepage-impacted well. This well shows a long-term increasing trend in pH values, stabilizing since 2015 (Figure 49). Figure 49 shows that, starting in approximately 1990, acid neutralization and buffering resulted in substantial pH increases in Wells 515 A, 516 A, and EPA 07. However, during the last several years the water quality has been declining in 515 A in the following ways: (1) field pH decreased from 7.21 in January 2011 to 6.02 in October 2019 (although it appears to have stabilized); (2) sulfate increased from 5,060 mg/L in January 2011 to 6,280 mg/L in October 2019; and (3) bicarbonate sharply increased from 321 mg/L in July 2010 to 916 mg/L in April 2013, then has since decreased slightly to 766 mg/L in October 2019. The increase in bicarbonate accompanied by the decrease in pH indicates that relatively acidic seepage-impacted water has moved through this location and the water is being buffered by reaction with calcium carbonate.

UNC has demonstrated (e.g., Chester Engineers, 2012c, 2014b) that pre-mining (natural) groundwater in Zone 1 is encountered along the northern boundary of Section 36 in Wells 142 and 143; that this natural groundwater is overlain up-dip by post-mining/pre-tailings (background) water; and that the interface between these two types of groundwater is not migrating to the north. The natural and background waters would provide effective barriers to any potential Zone 1 COC transport to the north of Section 36.

The Zone 1 NRC POC wells include Wells 604 and 614 within Section 2 and Wells EPA 04, EPA 05, and EPA 07 in Section 1. Wells EPA 04 and EPA 05 lie outside the mapped seepage-impacted area. During 2019, the following exceedances of NRC license standards (the number of quarterly exceedances is shown in parentheses) were reported for POC well samples (Appendix C; Table C.1).

NRC POC Well Standard Exceedances:

- Well 604 – nickel (4) and selenium (total, but not Se[IV]) (3);
- Well 614 – selenium (total) (3) and chloroform (TTHMs) (3); and
- Well EPA 07 – nickel (4) and selenium (total, but not Se[IV]) (3).

NRC license standards were also exceeded at non-POC Well 515A during 2019 for the following parameters: TTHMs (3), nickel (4), and selenium (total, but not Se[IV]) (3).

The reported results for nickel and chloroform were similar to recent historical data; but the TTHM exceedance in Well 614 (196 µg/L) was the highest concentration since 2013. The 2019 selenium (total) concentrations exceed most 2019 and recent historical Se(IV) concentrations. These results are discussed in Section 4.3.3.8.

EPA cleanup standards, for constituents that are not regulated by NRC (or for which the EPA cleanup standard is different from the NRC license standard [e.g., nickel]) were exceeded at the following locations (the number of quarterly exceedances for each parameter are shown in parentheses):

EPA Standard Exceedances:

- Well 604 – cobalt (4), nickel (2) and selenium (total, but not Se[IV]) (2).
- Well 614 – chloride (4) and selenium (total, but not Se[IV]) (3).
- Well EPA 07 – cobalt (3) and selenium (total, but not Se[IV]) (3).
- Well 515 A – TDS (4), sulfate (4), chloride (4), manganese (4), nickel (4) and selenium (total, but not Se[IV]) (3).

The 2019 cobalt concentrations for EPA 07 increased slightly, ranging from 0.08 mg/L in January to 0.107 mg/L in August, which is above the EPA cleanup standard of 0.05 mg/L. The 2019 cobalt and nickel concentrations detected in Well 604 were similar to the 2018 results and lower than historical results at this location. Chloride concentrations detected in Well 614 are similar to recent 2018 results. The selenium (total) concentration at Well 614 within Section 2 is elevated compared to past selenium (Se [IV]) results since 1997. The 2019 Well 515 A TDS, sulfate, chloride, manganese and nickel results were generally consistent with past monitoring events; Well 515 A selenium results were the highest measured since 1997 at this location.

Nitrate concentrations in samples from Well 614 (within Section 2) exceeded the EPA standard (190 mg/L) twice in 2016 and 2017 (Appendix C; Table C.1) but were all below the EPA standard in 2018 and 2019. Nitrate concentrations had followed an overall increasing, fluctuating, trend from July 2005 to July 2017; but have since followed an overall decreasing trend. Chloride concentrations at Wells 515 A and 614 exceeded the EPA standard (250 mg/L), as has frequently occurred at these locations historically.

Sulfate, TDS, and manganese are non-hazardous constituents that have historically been reported to exceed Site standards. The concentrations of sulfate and TDS reflect geochemical equilibrium of the groundwater with gypsum. There were no exceedances of the revised standards for these constituents at Zone 1 well locations outside Section 2 during 2019. These data affirm the NRC staff's position (NRC, 1996) that sulfate, manganese, and TDS should not be used as a basis to implement corrective action. The sulfate and TDS concentrations in Well 515 A at the Section 2 boundary increased slightly from 2011 through 2016 but appear to have stabilized in recent years. Manganese concentrations in Well 515 A samples have followed an overall decreasing trend since mid-2008, increased slightly in 2017 and have resumed their decreasing trend in 2018 and 2019. UNC has determined that Well 515 A does not meet performance criteria associated with low flow groundwater sampling methods, which limits the ability to collect representative samples.

Many other aspects of water quality have continued to improve since shutoff of the pumping wells, confirming that the degree of seepage impact is diminishing in both time and space. Natural attenuation processes include acid neutralization by:

- Reaction with the Zone 1 bedrock (which has a calcite [calcium carbonate] component of 0.03 percent [Canonie, 1987; Table 4.5]);
- Mixing with the neutral background water;
- Precipitation of metals and radionuclides; and
- Adsorption of metals (excluding manganese) and radionuclides.

These processes attenuate pH, metals, and other seepage constituents. The low transmissivity of Zone 1 slows migration and increases residence time for the attenuation processes.

4.3.3 Natural Attenuation System Performance Evaluation

The Zone 1 natural attenuation system comprises the hydro-geochemical interactions between the bedrock matrix, the anthropogenic background waters (derived from former mine-dewatering groundwater discharges), and the tailings fluids. The natural system is successfully attenuating the seepage impacts by the processes of neutralization, precipitation, adsorption, and a degree of passive mixing with the background waters. Previous annual reports have indicated some constituents will remain at above-standard concentrations because of the inherent geochemical characteristics of the Zone 1 background water; however, the revised Site standards better account for background geochemistry.

Table 18 shows the predicted geochemical performance of the Zone 1 natural attenuation system (revised from Earth Tech, 2002c). In summary, sulfate and TDS concentrations outside Section 2 are expected to meet the revised EPA cleanup standards that take into account the gypsum equilibrium in background groundwater. Similarly, manganese is expected to meet the revised EPA cleanup standard outside Section 2; Well 515 A is the only location that currently exceeds the standard. Although Well EPA 07 currently exhibits nickel, cobalt and selenium (total) concentrations that exceed NRC and/or EPA standards outside Section 2, evidence of continuing metals attenuation in upgradient areas suggests that conditions may ultimately be re-established at downgradient locations in Section 1. Well EPA 07 in Section 1 had exhibited a gradually increasing chloride concentration trend, exceeding the standard twice during 2017, but did not exceed the standard in 2018 or 2019. Outside of Section 2, TTHMs have always met the NRC/EPA standard and, based on trends, this condition is expected to continue. The individual constituents of concern are discussed below.

4.3.3.1 Sulfate and TDS

Sulfate and TDS are non-hazardous constituents and are not regulated by the NRC. Sulfate concentrations exceed the revised EPA cleanup standard in seepage-impacted water at one well (515 A) in Zone 1. Figure 50 shows historical sulfate concentrations through October 2019; Figure 51 shows the extent of sulfate exceedances during October 2019. The time-series indicate that the operation of extraction wells prior to July 1999 did not have a discernable influence on sulfate and TDS; sulfate concentrations in Zone 1 are controlled by the system's equilibrium with gypsum and they are broadly stable, with few exceptions. Based on this stability, sulfate and TDS concentrations in wells outside Section 2 are expected to meet the revised EPA cleanup standards, which take into account the gypsum equilibrium in background groundwater. There is some uncertainty because sulfate and TDS concentrations in Well 515 A at the Section 2 boundary increased slightly from 2011 through 2016 but appear to have stabilized.

4.3.3.2 Manganese

Manganese is a non-hazardous constituent in water that is not regulated by NRC. Manganese concentrations exceed the revised EPA cleanup standard in seepage-impacted water (Well 515 A) in Zone 1 within the Section 2 boundary. Concentrations have generally decreased over time as the acidic seepage has been neutralized, but the magnitude of the decrease is largely controlled by bicarbonate concentrations (Earth Tech, 2000a). Historical manganese concentrations through October 2019 are shown on Figure 52A and tabulated in Appendix C; Table C.1. Figure 52B shows the relationship between manganese concentrations decreasing as bicarbonate concentrations increase. The extent of manganese concentrations that exceeded the revised EPA cleanup standard during October 2019 is shown on Figure 53. Figure 52A shows that the long-term decreasing trend for manganese in Well EPA 07, from January 1998 through October 2008. Since then, concentrations varied between 1.22 and 3.02 mg/L, but remained well below the revised EPA standard. Well 604 manganese concentrations decreased from January 2004 through April 2015. Since then, concentrations varied between 3.52 and 4.57 mg/L. The concentration in October 2019 was at the high end of this range. Well 515 A concentrations had shown a sharp decline from 13.1 mg/L in July 2012 (Figure 52A) and appear to have stabilized, with some fluctuations, since October 2012. In 2019 the concentration in 515 A ranged from 6.62 to 7.51 mg/L. The overall decline is very likely related to the substantial increase in bicarbonate concentrations at this location since July 2010 (see Figure 52B).

Bicarbonate concentrations in seepage-impacted wells are related to the waters' degree of neutralization of acidic seepage. Figure 54 shows historical bicarbonate concentrations through October 2019. As discussed above regarding Zone 3, marked declines of bicarbonate concentration are indicative of (sometimes temporary) exceedance of the local buffering capacity of the natural geochemical system (i.e., the flux of acidity temporarily exceeds the rate of buffering). The plunge of bicarbonate concentration in Well EPA 05 from January 2000 to May 2000 is such an example (the EPA 05 bicarbonate concentration continued to decrease through 2014 but appears to have stabilized within the range of 40 to 96 mg/L). A second example of historical bicarbonate trends is provided by Well EPA 07 (Figure 54), where formerly very low bicarbonate concentrations have increased step-wise beginning in July 1990, with additional upward steps in January 1994, again in October 1998, and again in May 2000. Since April 2010, concentrations have varied between 533 and 689 mg/L. The concentration in October 2019 was at the low end of this range (533 mg/L). The rising concentrations indicated that the natural attenuation neutralization capacity has not been depleted. While tailings-impacted water may be reaching this location the buffering capacity has not been overcome by the flux of acidity. Bicarbonate concentrations at Well 614 have shown sharp fluctuations in the past and did so again in 2018, having risen from 755 mg/L in July to 1550 mg/L in October. The 2019 concentrations fluctuate between 1,270 and 1,490 mg/L.

The seepage-impacted wells that have had bicarbonate concentrations greater than 1,000 mg/L (Wells 614, 516 A, and EPA 05) either have never had manganese exceedances or have had a significant decrease in manganese concentration to below the revised cleanup standard (5.4 mg/L). In contrast, seepage-impacted wells with lower bicarbonate concentrations, such as Wells 515 A, 604, and EPA 07, have historically had elevated manganese concentrations. However, even among these wells the effect of bicarbonate on manganese concentrations is well illustrated by data from Well EPA 07. Since July 2001, bicarbonate concentrations in Well EPA 07 (in Section 1) have exceeded 500 mg/L (Figure 54) and the manganese concentration steadily declined through October 2008 (Figure 52A). Since then the manganese concentrations have been below the revised cleanup standard and the bicarbonate fluctuated within an overall stable trend. This geochemical behavior has previously been analyzed by Earth Tech

(2000c). Another example of this correlation is Well 515 A, where the recent increase of bicarbonate concentrations correlates with decreasing manganese concentrations (Figure 52B).

In contrast to seepage-impacted wells, higher manganese concentrations at Well EPA 04 represent background water quality. Similarly, Well EPA 08, located beyond the tailings-impacted zone in background water to the east of EPA 04, also showed higher manganese concentrations through the termination of groundwater quality monitoring in January 2000. Most of the other constituents at EPA 08 had been fluctuating to steady since 1989 (Appendix C; Table C.1).

In summary, the limited neutralization capacity in background water results in elevated manganese concentrations that exceeded the revised EPA standard. The revised EPA standard is based on a statistical analysis of background manganese concentrations and appropriately accounts for these geochemical conditions. The only location where manganese concentrations currently exceed the revised EPA cleanup standard is Well 515 A, where concentrations have declined significantly over time but appear to have stabilized (with fluctuations); exceedance of the revised EPA manganese standard within the property boundary will continue at those locations where there is insufficient neutralization capacity to reduce the manganese concentrations. UNC agrees with NRC (1996) that manganese is not a useful indicator of seepage impacts or remediation success and it should be removed as a parameter of concern for all the reasons that have been discussed.

4.3.3.3 Chloride

Chloride concentrations in Well EPA 07 in Section 1 were below the EPA standard (250 mg/L) for all four quarters in 2019 after exhibiting a gradual increase and multiple standard exceedances over the past few years (see Appendix C; Table C.1). Chloride is a non-hazardous constituent and a secondary contaminant that is not regulated by NRC. Chloride concentrations at Wells 515 A and 614 exceeded the EPA standard in all four 2019 sampling events, as has frequently occurred at these locations since the start of monitoring during 1989. The EPA cleanup level for chloride derives from the New Mexico Water Quality Act; 250 mg/L is also the federal SMCL (this constituent does not have a federal primary MCL or an NRC license standard). Based on observed historical chloride concentration fluctuations in Zone 1 monitoring wells, it is possible that chloride will continue to meet the EPA cleanup level outside Section 2 in the future.

4.3.3.4 Cobalt and Nickel

As has been the case since 2014, nickel was the only metallic hazardous constituent that exceeded its current NRC license standard outside the UNC property boundary in Zone 1 during 2019. Nickel concentrations exceeded the NRC license standard (0.07 mg/L) at Well EPA 07 in all four 2019 samples (range 0.104 to 0.14 mg/L). There were no exceedances of the revised EPA cleanup level outside Section 2. Figure 55A shows historical nickel exceedances at both EPA 05 and EPA 07. Historical nickel concentrations had decreased at both wells such that there were no detections from April 2005 to January 2014 at EPA 07, and from July 2007 to October 2011 at EPA 05. Subsequent to those periods, nickel concentrations at both wells have periodically exceeded the current license standard (see Figure 55A and Appendix C; Table C.1). Within Section 2 during 2019, nickel concentrations exceeded standards at Wells 515A and 604 (NRC license standard). The ranges of reported concentrations for these wells were similar to those in previous years.

Cobalt is not regulated by NRC. Cobalt concentrations exceeded the EPA standard (0.05 mg/L) at Well EPA 05 in July 2015 (0.06 mg/L) and the five previous quarters (range 0.07 to 0.1 mg/L), but all samples

collected since then have been equal to or below the EPA standard. Cobalt concentrations exceeded the EPA standard (0.05 mg/L) in all four samples collected in 2019 from Well EPA 07 (range 0.08 to 0.107 mg/L) and Well 604 (range 0.092 to 0.106 mg/L).

Figure 55B shows that historical cobalt concentrations decreased at Wells EPA 05 and EPA 07 and were below the standard between October 2007 and January 2013. Following a pattern similar to nickel concentrations, cobalt concentrations in both wells increased briefly, subsequently decreased, and in EPA 07, increased again in the second half of 2017 through 2019. The extent of cobalt and nickel exceeding the EPA and NRC standards, respectively, during 2019 is shown in Figure 56. The area is the same as that shown for October 2017, because the 2019 cobalt and nickel concentrations are similar.

Cobalt and nickel typically do not adsorb sufficiently to reduce their concentrations below their standards until the pH is approximately 6.5 or more (Earth Tech, 2002c). For example, cobalt and nickel concentrations in Well EPA 07 historically have fluctuated around their respective standards as the pH has increased to above 6.0. Neutralization of tailings seepage in Well EPA 07 (pH rose steadily from approximately 4 to 7 throughout the 1990s) has been the geochemical impetus for reductions in concentrations to levels below the standards for cobalt in April 2002 and nickel in January 2003. Empirically (Appendix C; Table C.1) it appears that a pH of approximately 6.0 may promote adsorption sufficient for reduction of concentrations to below the standards for both parameters at most monitoring locations. However, fluctuating nickel and cobalt concentrations observed at Wells EPA 05 and EPA 07 from 2013 through 2019 do not consistently correspond with the relatively small changes in pH during this period (Appendix C; Table C.1). It is possible that these fluctuations are related to local changes in redox conditions or the formation of inorganic dissolved complexes.

With the exception of the previously described variability at Wells EPA 05 and EPA 07, the cobalt and nickel time series (Figures 55 A and B) empirically demonstrate that natural attenuation occurs in two senses: over time at a given location, and spatially downgradient of the eastern part of the Central Cell. This evidence of continuing metals attenuation in upgradient areas suggests that conditions for attenuation may ultimately be re-established at downgradient locations in Section 1.

4.3.3.5 Combined Radium-226 and Radium-228 and Gross Alpha

Similar to the metals, combined radium is attenuated by neutralization, precipitation, and adsorption. Historical combined radium activities through October 2019 are presented in Figure 57. There were no exceedances of the NRC/EPA standard for combined radium (12.1 pCi/L) at any Zone 1 monitoring location during October 2019 (Table 17) or the other 2019 monitoring events (Appendix C; Table C.1).

Table 17 shows that there were no exceedances of the NRC license standard for gross alpha activity in the October 2019 samples. Exceedances of the gross alpha standard in Zone 1 wells have occurred historically but not recently.

4.3.3.6 Total Trihalomethanes (TTHMs)

During October 2019, TTHM concentrations exceeding the NRC/EPA standard (80 µg/L) were detected at Well 515 A and Well 614, both of which are within the property boundary. The range of TTHM concentrations at Well 515 A in 2019 (72 to 390 µg/L) was within the range of concentrations detected since January 2012. The range of TTHM concentrations in 2019 samples from Well 614 was 60 to 196 µg/l. Only very low TTHM concentrations were detected at wells located in Section 1 during 2019 (maximum 2.2 µg/l in Well EPA 07).

4.3.3.7 Pb-210

Table 17 and Appendix C; Table C.1 show that there was only one Pb-210 detection in samples from Zone 1 wells in the October 2019 monitoring event (Well EPA 05; 0.08 pCi/L). Pb-210 was detected in 2019 samples below the NRC license standard in Wells 515 A, EPA 05, and EPA 07 (refer to Appendix C; Table C.1).

4.3.3.8 Arsenic and Selenium

The comparison of total arsenic and selenium results to the speciated results in Zone 1 indicates that total concentrations are generally similar to, or higher than, speciated concentrations (refer to Appendix C; Table C.1 and comparison table in Appendix D; Table D.1). All 2019 arsenic (total) and As(III) results were below the EPA and NRC standards. Selenium (total) was detected at concentrations exceeding NRC and/or EPA standards in four wells (POC wells 604, 614, and EPA 07 and non-POC well 515A) for all three of the 2019 monitoring events in which it was analyzed; there were no exceedances of Se(IV) at any location. Well EPA 07 is the only location outside Section 2 where selenium (total) concentrations exceeded the standards; the 2019 EPA 07 selenium (total) concentrations were higher than the 2019 and 2018 Se(IV) concentrations, which were all non-detected.

Overall, the reported total selenium concentrations do not significantly change conclusions about the Zone 1 remedy. All selenium (total) exceedances in seepage-impacted water were detected at locations where other analytes have also exceeded standards in recent years. The EPA 07 selenium (total) concentrations are similar concentrations to nickel and cobalt exceedances identified at this location. UNC will continue to evaluate total arsenic and selenium concentrations and speciated concentrations, where warranted during the 2020 monitoring events and reassess the analytical program in the 2020 Annual Review Report.

4.4 Alternate Concentration Limits Application

In December 2008, UNC submitted an ACL application (N.A. Water Systems, 2008g) to NRC for TTHMs in POC Well 614 and nickel in POC Well 604. Both wells are located along the eastern property boundary in Section 2 (see Figure 48). This document followed NRC's guidance for organizational content and included sections addressing hazard assessment, exposure assessment, and corrective action assessment (including an As Low As Reasonably Achievable (ALARA) demonstration).

During 2011, NRC stated that this ACL application is unacceptable because the proposed POEs (Wells EPA 05 and EPA 07) are not located on UNC property. This proposal was made because there is no space for more wells to the east of the Central Cell in Section 2, such that there would be spatially separate POC wells (604 and 614) and POE wells. Nonetheless, it is important to understand the key issues related to UNC's ACL application from 2008, which are summarized next.

The NRC license standard for nickel is 0.07 mg/L (revised from 0.05 mg/L in 2015). The New Mexico Water Quality Control Commission (NMWQCC) standard for nickel is 0.2 mg/L and is the basis of the revised EPA cleanup standard identified in 2015 (Chester Engineers, 2015b). The NRC license standard for TTHMs is 0.08 mg/L; this is the same value as the federal MCL (and current EPA standard). The NMWQCC standard for TTHMs is 0.1 mg/L.

In developing the proposed ACLs, UNC conducted concentration trend analyses from the final shutoff of Zone 1 pumping wells in July 1999 through July 2008. In addition, historical groundwater quality has been

reviewed for all monitoring wells in Zone 1. Based on these observations, UNC proposed the ACL of 0.4 mg/L for nickel at POC Well 604, and the ACL of 0.3 mg/L for TTHMs at POC Well 614.

Since the termination of pumping, most constituent concentrations have progressively reduced through natural geochemical processes (as discussed in detail for all constituents in this 2019 Annual Review Report). Fluctuations of nickel and cobalt concentrations at Zone 1 Wells EPA 05 and EPA 07 during the past few years are within the range of historical concentrations and may be related to local geochemical fluctuations. The analysis presented in the ACL application indicated that the spatial extent of Zone 1 seepage impact is stable to diminishing, and that natural attenuation by neutralization (buffering) and adsorption is occurring for the metals (including nickel), and that attenuation by degradation, dilution, and dispersion is occurring for chloroform. Evidence of continuing metals attenuation in upgradient areas suggests that conditions for attenuation may ultimately be re-established at downgradient locations in Section 1.

The 29-year history of continuous groundwater quality monitoring in Zone 1 (and Site-wide) provides a sound empirical basis for evaluating contaminant transport and attenuation. The key conclusions of the ACL application are provided (in italics) with comments (in parentheses) below:

- *There is no nickel or chloroform at concentrations above standards in any Section 1 well.* (This statement has since remained valid for chloroform. However, subsequent to this application, nickel concentrations detected at Wells EPA 05 and EPA 07 in Section 1 have exceeded the historical standard and the current NRC standard [but not the revised EPA standard]. These recent fluctuations of nickel concentrations at Wells EPA 05 and EPA 07 are within the range of historical concentrations. Nickel concentrations in Well EPA 05 dropped below the NRC license standard in July 2015 and have since remained below this level. Nickel concentrations in Well EPA 07 have recently exceeded the NRC standard. Additionally, 2019 selenium (total) results samples exceeded NRC and EPA standards in POC wells 515A, 604 and 614 and in Section 1 POC well EPA-7).
- *The long monitoring history provides more than sufficient time to detect exceedances and to evaluate trends.*
- *Source area concentrations within Section 2 show decreasing long-term trends.*
- *Constituent concentrations progressively decrease downgradient.* (However, note the statement about EPA 05 and EPA 07 in the top bullet of this list).
- *Hydraulic gradients and groundwater flow rates are diminishing over time.*
- *Groundwater quality is expected to continue its improvement at the proposed point-of-exposure (Wells EPA 05 and EPA 07) from levels which are below Site standards.* (However, note the statement about EPA 05 and EPA 07 in the top bullet of this list).
- *There are no Zone 1 exceedances of the license GWPS in Section 36 (UNC property) or Section 1 (Indian Trust Land property), nor are there exceedances of any hazardous constituents within seepage-impacted water outside of Section 2.* (However, note the statement about EPA 05 and EPA 07 in the top bullet of this list.)
- *The proposed Zone 1 remedy of No Further Action plus ACLs will be protective of human health and the environment.* (A large part of Zone 1 in Section 1 is dry, and this hydrostratigraphic unit is physically and chemically non-viable for sourcing domestic or stock water supply wells. Treatment of either the seepage-impacted or background water, to potable quality, would be extremely expensive and is not feasible).
- *UNC has demonstrated ALARA conditions in Zone 1.*

5 Conclusions and Recommendations

This annual review evaluated the performance of the natural systems in all three Site hydrostratigraphic units and the active remediation in Zone 3. As was the case for the 2015 through 2018 Annual Reports, the Site groundwater standards used for data comparisons in this annual report are those that had been revised in conjunction with the establishment of statistically based background threshold values (BTVs) during 2015. NRC issued a license amendment to update Site GWPSs (NRC, 2015) and EPA approved the use of the revised cleanup levels (EPA, 2015) for remedy alternative evaluation in the ongoing SWSFS. These agency actions lessen one of the technical impediments (GE, 2009) to eventual Site closure which stated that "long-term monitoring data and basic geochemical considerations reveal some cleanup objectives to be unattainable." For most parameters, the establishment of BTVs through statistical analysis will incorporate and account for the geochemical influence on groundwater quality and facilitate the identification and assessment of contaminants of concern.

In the Southwest Alluvium and Zone 1, the natural systems have functioned as effectively as when active remediation took place. Acidic seepage is being neutralized, resulting in attenuation of metals and radionuclides. During 2019, extraction well pumping continued in part of Zone 3. This extraction of seepage-impacted groundwater started with the hydrofracture program in 2005 and was supplemented, starting in 2009, with extraction from certain NW-series wells located near the northernmost area of seepage impact. The purpose of the upgradient wells (e.g., the hydrofracture or RW-series wells) is primarily to dewater and recover contaminant mass, while the purpose of the downgradient wells (e.g., the NW-series Wells NW-2 and NW-5) is to form a hydraulic barrier. The Zone 3 pumping system has been declining in performance and has approached the limit of its effectiveness due to declining saturated thicknesses, as predicted. Extraction from well NW-2 was suspended as of November 13, 2019, because the water level dropped below the pump intake and well recharge was insufficient to reliably operate the pumping system.

5.1 Conclusions

Below are some of the key conclusions of this report:

- The following four monitoring wells do not meet performance criteria associated with low flow groundwater sampling methods, which limits the ability to collect representative samples at these locations: Wells GW-3 and 632 (both are POCs in the Southwest Alluvium), Well 515 A (non-POC in Zone 1) and Well 517 (POC in Zone 3). Well 719 also has a very low volume available for sampling and is considered to have "borderline" suitability for low-flow sampling methods. Additionally, Wells GW-2 and GW-3 can no longer be sampled safely, because of their proximity to the unstable edges of the Pipeline Arroyo canyon. All these monitoring wells should also be removed from the monitoring program.
- Data collected from Wells 420 and 446 are no longer valid. As of April 2017, the water level in Well 420 was below the base of Zone 3 and the screened interval of the well. Therefore, water level measurements and water samples collected since April 2017 at this location are considered not to be representative of Zone 3 (the water chemistry associated with Zone 2 [primarily shale and coal] would be expected to be dissimilar). Well 420 may be influenced by active pumping of the RW-series wells, so it could also become relevant again if pumping were to be terminated. Well 446 water level measurements are also no longer valid because the water level is below the bottom of the screened interval (there is a 10-ft section of blank well casing below the well screen) and it is difficult to measure due to the presence of a floating natural oil lens.

- Uranium concentrations in the Southwest Alluvium are not related to the migration of uranium in tailings fluids. The range of uranium concentrations in the background water has been empirically shown to be the same as the range within seepage-impacted water (GE, 2006). Uranium and bicarbonate concentrations have been observed to be covariant in the Southwest Alluvium groundwater, i.e., when the concentration of the bicarbonate parameter changes, uranium changes with it, provided that there is uranium available for dissolution or desorption in the sediments. This observation has held for most Southwest Alluvium wells for both the period of active pumping period (more than 11 years) and post-pumping monitoring period (more than17 years) and is expected based on principles of aqueous chemistry.
- Concentrations of uranium in the Southwest Alluvium are an indicator that natural attenuation is at least as effective a remedy as pumping. With the exception of POC Well GW-3, which was last sampled in 2015, uranium concentrations and concentration time trends have either stabilized or shown decreasing trends since the pumps were turned off. The increasing trend of concentrations at GW-3 did not necessarily relate to the shutoff. Since July 2009, the increasing uranium concentration trend is the result of covariance with bicarbonate concentrations. Additionally, the very low saturated thickness in GW-3 (2.07 ft in July 2015 and projected to now be dry) may contribute to elevated dissolved constituent concentrations (i.e., consistent with the hypothesis developed by NRC [1996]) that dissolved salt concentrations will increase as the aquifer system dries out). As the saturated thickness declined, the well may have become isolated or hydraulically disconnected from the Southwest Alluvial flow system; groundwater under these conditions is not representative of typical groundwater quality because it has greater opportunity to geochemically evolve and reach local equilibrium with the formation. Uranium concentrations at non-POC Well EPA 25 and upgradient Well 509 D, which had previously shown increasing trends, have stabilized. Well EPA 25 uranium concentrations (October 2019, 0.114 mg/L) remain substantially lower than the NRC license standard; the previous slightly increasing trend was the result of covariance of uranium and bicarbonate concentrations. Well 509 D is located outside the zone of influence of the former pumping wells; therefore, it is not a good indicator of whether there is a benefit to pumping.
- The source of uranium in the Southwest Alluvium was not the tailings seepage but mine waters with uranium concentrations up to 2 mg/L that were historically discharged under permit into the Pipeline Arroyo and infiltrated into the Southwest Alluvium. Empirical data show that the elevated uranium concentrations in the mine discharge (i.e., the historical background concentrations) have been broadly and significantly attenuated in the alluvium in that most of the seepage-impacted wells have shown overall stable trends since the pumping system shutdown. The interaction of the uranium in the Southwest Alluvium sediments with varying geochemical (e.g., bicarbonate) or hydrologic factors (e.g., reductions in saturated thickness or isolation from the groundwater flow system) may result in variable concentration trends accompanied by localized exceedances of the Site uranium standard (e.g., at Wells GW-3 and 509 D). The UPL95-based BTV calculation method is inappropriate for uranium in the Southwest Alluvium; the uranium standard in the Southwest Alluvium should be waived because the principal source of uranium for both background and seepage-impacted waters was not tailings seepage, but rather the mine discharge water. The observed spatial and temporal variability in Southwest Alluvium water uranium concentrations is related to factors that are unaccounted for in the UPL95-based BTV analysis. Those factors include the likely heterogeneity of the uranium distribution in the sediments; uranium concentrations in the Southwest Alluvium attenuate via adsorption and/or precipitation such that background uranium concentrations decrease with increasing distances downstream and away from the arroyo centerline. It also is not possible to ensure that a standard will be achieved consistently throughout the seepage-impacted area as the geochemistry fluctuates and water levels decline over time. Moreover, the standard will only be attained upon extraction of all water in the alluvium, which is not practicable.

- Groundwater levels in the Southwest Alluvium continued to decline (with periodic fluctuations observed) in 2019, indicating that the artificially recharged zone of saturation continues to become naturally dewatered as the groundwater drains down the arroyo. The water level in SBL-01 has a lower rate of decline than other local wells. The water level elevation in SBL-01 has been higher than the water level elevation in Well 624 since 2015 and the SBL-01 water level elevation has been higher than that in Well EPA 25 since July 2018.
- The position of the downgradient limit ("nose") of the 1,000 mg/L bicarbonate isoconcentration contour shown in Figure 8 has been modified from that presented in the 2014 through 2017 Annual Reports. Because the piezometric elevations in SBL-01 and points east are depicted as being higher than in Well 624 (in Figure 3A), Well SBL-01 is no longer downgradient of the "nose" of the plume. Instead, hydraulic gradients are to the west-southwest and the "nose" of the 1,000 mg/L bicarbonate isoconcentration line is to the north of SBL-01, as depicted on Figure 8. The saturated thickness map in Figure 3B is also consistent with this interpretation, because the greater saturated thickness to the north of SBL-01 implies that the mass flux would be greater in the area north of SBL-01.
- During 2019, both onsite and offsite seepage-impacted water quality in the Southwest Alluvium met the NRC GWPSs (Appendix A; Table A.1).
- Except for 12 uranium NRC license standard exceedances in samples collected from Well GW-3 between July 2012 to July 2015, the groundwater quality at all POC wells has met the current license standards since January 2011. Historically, exceedances of the current NRC license standards are otherwise infrequent, and most occurred more than a decade ago.
- Hydraulic containment is not a necessary feature of the corrective action program in the Southwest Alluvium because of the geochemical attenuation that occurs naturally. The natural system is as, or more, effective than pumping for controlling the migration of the constituents of concern. There were no exceedances of the NRC license standards in offsite seepage-impacted water during 2019. The only recent exceedances include the multiple uranium detections at Well GW-3 (2012 to 2015) and chloride in two GW-1 samples (one each in 2015 and 2017). The GW-3 (2012 to 2015) uranium exceedances appear to be an isolated and localized effect of desaturation and non-representative samples (because of insufficient flow to meet the low-flow sampling SOP).
- The non-hazardous constituent manganese exceeds its revised EPA standard in the Southwest Alluvium in seepage-impacted wells within Section 2 and in background Well SBL-01 within Section 10.
- During 2019, there were four exceedances of the NRC license standard for nickel in the Southwest Alluvium in background Well SBL-01 (in Section 10).
- Locally increasing trends of common dissolved ion concentrations in the Southwest Alluvium are unrelated to tailings seepage; they derive from the reaction of the anthropogenic recharge water with natural alluvium materials. Heterogeneous distributions of the soluble alluvium minerals are the most significant factor affecting the intra-well and inter-well variations in the concentrations of common dissolved ions (e.g., sulfate and TDS).
- Evaluation and prediction of constituent concentrations in the Southwest Alluvium is predicated on understanding the geochemical evolution of both the background water quality and later changes associated with passage of the seepage-impact front. Hazardous constituents (e.g., metals) derived from seepage impact are effectively attenuated to acceptable concentrations within the Site boundary.
- Arsenic and selenium concentrations reported during 2019 varied in comparison to previous years. Historically reported arsenic and selenium analyses have represented specific oxidation states (or species, i.e., As[III] and Se[IV]). UNC adjusted its analytical approach to these parameters in response to an early 2019 NRC determination that samples from certain Site wells should be classified as 11(e)2 byproduct material. This designation limited the facilities that could perform the arsenic and selenium

speciations, therefore, Energy Laboratories specified that (1) "total" arsenic and selenium analyses (i.e., including all oxidation states or species) to be performed for all of the April through October samples as a screening level test and (2) speciated arsenic and selenium analyses to be performed for a subset of the samples. Reported total concentrations are shown in the Appendix tables A.1, B.1, and C.1 and all arsenic and selenium results (both total and speciated) are shown in comparison Table D.1 in Appendix D. UNC will continue to evaluate total arsenic and selenium concentrations and speciated concentrations, where warranted, during the 2020 monitoring events and reassess the analytical program in the 2020 Annual Review Report. A comparison of the total arsenic and selenium results to the speciated results indicates that total concentrations are generally similar to, or higher than, speciated concentrations. Notable differences were identified for both arsenic and selenium at Zone 3 wells and for selenium at Zone 1 wells, but the only exceedances of total arsenic or selenium in seepage-impacted water outside Sections 2 and 36 were in samples from Well EPA 07. Overall, the reported total arsenic and selenium concentrations do not significantly change conclusions about the Site remedy made in recent years, for the following reasons:

- In the SWA, there were no arsenic or selenium results (total or speciated) that exceeded NRC or EPA standards during 2019.
- In Zone 3, arsenic (total) exceedances occurred only in a background location (NW-3) and one sample from seepage-impacted Well EPA 13 (concentrations were below the standard in later samples). Selenium (total) exceedances occurred only at two seepage-impacted locations where other analytes also exceeded standards.
- In Zone 1, all selenium (total) exceedances in seepage-impacted water were detected at locations where other analytes have also exceeded standards. The selenium (total) exceedances at Well EPA 07 outside Section 2 were detected at similar concentrations to nickel and cobalt exceedances identified at this location.

- Both the Southwest Alluvium and Zone 1 natural systems are at least as effective as the former active remediation systems in attenuating the seepage-impacted water. Acidic seepage is being neutralized, resulting in attenuation of metals and radionuclides. Natural geochemical conditions related to gypsum equilibrium and bicarbonate availability will control sulfate and manganese concentrations in both hydrostratigraphic units, regardless of whether or not the extraction wells are operated.
- Groundwater elevations in Zone 1 continued to decline overall (with small fluctuations) in 2019, causing the saturated thickness that accommodates groundwater flow and constituent migration to diminish in the up-dip parts of this bedrock stratigraphic unit.
- There were seven exceedances of NRC license standards in Zone 1 outside Section 2 in 2019. The Well EPA 07 nickel concentrations exceeded the NRC license standard in all four samples collected in 2019 and selenium (total) exceeded the NRC license standard in all three quarterly sampling events in which it was analyzed. Cobalt concentrations exceeded the revised EPA cleanup standard at Well EPA 07 in all four samples as well. With the exception of selenium, which hasn't exceeded standards since April 1997, these fluctuating concentrations are within the range of historical concentrations and may be related to local changes in redox conditions. Evidence of continuing metals attenuation in upgradient areas suggests that conditions for attenuation may ultimately be re-established at downgradient locations in Section 1.
- Outside the UNC property boundary in Zone 1, the post-pumping groundwater quality continues to improve overall (Tables 17 and 18). The concentrations of non-hazardous constituents sulfate and TDS in Wells EPA 05 and EPA 07 reflect geochemical equilibrium of the groundwater with gypsum; there were no exceedances of the EPA cleanup levels for these constituents outside Section 2 during 2019. Chloride concentrations in samples from Well EPA 07 in Section 1 were below the EPA standard (250

mg/L) for all four quarters in 2019 after having exhibited a gradual increase and multiple standard exceedances over the past few years (see Appendix C; Table C.1). Chloride is a non-hazardous constituent and a secondary contaminant that is not regulated by NRC.

- Groundwater levels in Zone 3 continued in most wells to decline in 2019, indicating that the anthropogenic zone of saturation continues to diminish as the groundwater drains down the dip of the bedrock layers. Pumping of extraction wells since 2005 has locally accelerated the rate of water level decline in northern Zone 3. The declining water levels prevented sample collection at five northern Zone 3 monitoring wells (NBL-01, PB-03, PB-04, NW-1 (after May 2019), and MW-6) during 2019.
- The Zone 3 NRC POC wells (517, 613, 708, and 711) are within the most highly acidic seepage-impacted water. The following constituents exceeded NRC license standards at the POC wells during the 2019 quarterly monitoring (the numbers in parentheses indicate the number of exceedances):

  - Well 517 –nickel (4).
  - Well 613 – beryllium (4), nickel (4), selenium [total, but not Se(IV) (3), vanadium (4), uranium (4), and thorium-230 (4).
  - Well 708 – beryllium (3).
  - Well 711 –nickel (3).

- NRC license standards for beryllium, nickel, selenium (total but not Se(IV]), and uranium were also exceeded in seepage-impacted water at non-POC monitoring locations (e.g., Well 0717) during 2019. Additionally, the NRC license standards for arsenic and gross alpha were exceeded in samples from northern Zone 3 Well NW-3 which is interpreted to monitor predominantly background water. The NW-1 arsenic (total) concentrations were unusually high (range 9.51 to 10.4 mg/L), as were the speciated (As[III]) concentrations (range 1.6 to 7.7 mg/L, see Appendix D). Arsenic (total) was also detected above NRC license standards in seepage-impacted Well EPA-13 (0.828 mg/L) during the April 2019 sampling; however, the July and October 2019 concentrations were below the standard. The corresponding As[III] results for all four quarters were all below the NRC standard (maximum 0.016 mg/L, see Appendix D; Table D.1). Notable arsenic exceedances (maximum 2.5 mg/L) were historically reported in nearby Well NBL-01 from 2002 to 2008, under both background and partially seepage-impacted conditions. The reported NW-3 arsenic concentrations may be associated with declining saturated thickness and the increasing exposure of coal (and possibly pyrite) in the lower part of Zone 3.
- EPA cleanup standards were exceeded in Zone 3 for beryllium, TDS, sulfate, aluminum, arsenic (total and As[III]), beryllium, cobalt, manganese sulfate and TDS during 2019. These are constituents that are not regulated by NRC, or for which the EPA cleanup standard is lower than the NRC license standard (e.g., arsenic and beryllium).
- The source of uranium in both background and seepage-impacted water in Zone 3 was not tailings seepage, but mine water, permitted to contain uranium concentrations up to 2 mg/L, discharged to Pipeline Arroyo for 17 years. Uranium has been historically detected at relatively elevated concentrations in both background and seepage impacted wells in Zone 3. The 2019 pattern (Figure 44B) of uranium concentration contours in the central and northern seepage-impacted area continues to illustrate incursion of background water due to pumping as described in 2017. Uranium concentrations at Well 717 along the northwestern edge of the seepage-impacted area have shown an increasing trend since 2013 (to a January 2019 maximum concentration of 0.808 mg/L) during a period where seepage impacts have been sustained or increased, as evidenced by pH values less than 4 and increasing metals concentrations. The observed uranium concentration variability is attributed to geochemical reactions occurring in the areas where seepage impacted water and background

water interact such as where groundwater is transitioning from one type to the other along the contact between both water types from Well EPA 14 to Well 420 (including Well 717). Along this band (or contact) water quality varies significantly over a very short distance (see Figures 35 and 43) and is subject to local redirection of groundwater flow by extraction Well RW-16 (and to a lesser degree Wells RW-17 and RW-11). Reactions between these two water types and the host rock have been described and led to the decision to cease groundwater recovery operations in the Stage II recovery wells in 2000 (GE, 2000). Uranium concentrations are likely to remain dynamic in this area as saturated thicknesses decline, and groundwater flow directions vary due extraction well pumping.

- Pumping in the northernmost part of Zone 3 has created a mixing zone of background and seepage-impacted water; therefore, the mapped position of the seepage-impacted water is dynamic. Based on bicarbonate and pH data, the northern edge of the seepage-impact front for October 2019 has been adjusted from that shown in 2018 to encompass both Well NW-5 and Well NW-2 (now fully impacted) and continue to adjoin MW-6. Well NW-1 is shown to be outside the seepage-impacted area based on its recent water chemistry, but it could not be sampled for laboratory analysis due to a lack of sample volume at any time during 2019 nor for field parameter measurements after May 2019. It is anticipated that seepage-impacted groundwater water will continue to be retarded by pumping from Well NW-5 (to the degree pumping can be maintained). UNC continues to evaluate the chemistry and water levels in the northern Zone 3 wells, which may result in further modifications to the pumping rates to optimize the extraction system operations or to cease operations.
- All Zone 3 pumping well capacities decline over time. As anticipated by Appendix A of the ROD (EPA, 1988b), one important cause is the loss of saturated thickness. All of the Zone 3 extraction wells have yields below 0.3 gpm and saturated thickness has decreased significantly in seepage impacted areas. NW-2 appears to have reached the end of its capability as a pumping well as pore spaces have been clogged by fine clays and flow to the well has been reduced. Extraction from Well NW-2 was suspended on November 13, 2019, because the water level dropped below the pump intake and well recharge was insufficient to reliably operate the pumping system. It will not be possible to pump out all of the seepage-impacted water in Zone 3. Additionally, UNC has demonstrated that the efficiency of seepage-impacted water removal has declined with time and is expected to continue to degrade. Extraction wells having yields less than the 1 gpm decommissioning criterion may be recommended to NRC for decommissioning in a future license amendment request. The evaluation will consider the differing objectives of the two sets of extraction wells (i.e., the upgradient RW-series wells and the downgradient NW-series wells).
- UNC believes that overall conditions are such that active remedial operations in Zone 3 are reaching the limits of their effectiveness. As a result, continued operation will be met with diminishing returns, and/or will adversely affect groundwater quality in some ways as was seen a decade ago with the former pumping system. For example, the migration of background water toward the Zone 3 extraction wells will lead to increased concentrations of uranium and other parameters (e.g., molybdenum).
- UNC personnel report some concerns about the reliability of the extraction well flowmeter data as the saturated thickness declines, due to both the low flow rates/volumes and the presence of suspended clays that coat the flowmeter components and periodically render them inoperable.
- There are no exceedances of NRC license standards for hazardous constituents in Zone 3 outside the UNC property within seepage-impacted groundwater.

5.2 Recommendations

5.2.1 Recommendations for Closure of Southwest Alluvium Remedial Action

The predicted performance of the Southwest Alluvium natural attenuation system is summarized on Table 6. The continuing assessment of natural attenuation in this annual report is the basis for the following recommendations for the Southwest Alluvium corrective action system:

1. Monitoring wells that do not meet performance criteria associated with low flow groundwater sampling methods (which limits the ability to collect representative samples) or are otherwise unsuitable for monitoring should be decommissioned. In the Southwest Alluvium, these wells include, but may not be limited to, Well 632 (POC in the Southwest Alluvium), Well GW-3, and Well GW-2 (the latter two can no longer be sampled safely). UNC may submit a new license amendment request to NRC that will specify recommended modifications to the performance monitoring program, including recommended replacement wells, where applicable and available.

2. Decommission the pumping wells and implement a No Further Action remedial alternative. Attenuation via natural geochemical processes has been shown to be at least as effective as pumping.

3. The corrective action monitoring program for the Southwest Alluvium under the NRC Source Materials license should be discontinued (except for selected POC wells). With the exception of the recent Well GW-3 uranium exceedances (which can be explained on the basis that the well is not providing representative samples), the groundwater quality at all POC wells has met the license standards since January 2011.

4. The uranium standard in the Southwest Alluvium should be waived, because the principal source of uranium for both the background and seepage-impacted water was the permitted mine discharge water rather than the tailings seepage. Past exceedances at Wells GW-3 and 509 D demonstrate that it is not possible to ensure that a standard will be achieved consistently throughout the seepage-impacted area because of the interaction of uranium in the Southwest Alluvium sediments with varying geochemical (e.g., bicarbonate) or hydrologic factors (e.g., reductions in saturated thickness, or isolation from the groundwater flow system). The standard will only be attained upon extraction of all water in the alluvium, which is not practicable.

5. Sulfate, TDS, and manganese should be waived as constituents of concern or removed from the Southwest Alluvium monitoring program based on NRC's (1996) background water quality analysis report and multiple reports by UNC (many of which are summarized in the SWSFS Part I, N.A. Water Systems, 2007b; and Chester Engineers, 2009b). A Technical Impracticability waiver was previously recommended for sulfate and TDS but would not be necessary under the revised EPA cleanup standards. In the Southwest Alluvium, there are no sulfate or TDS concentrations in seepage-impacted water or manganese concentrations in seepage-impacted water outside Section 2 that exceed the revised EPA cleanup standards.

5.2.2 Recommendations for Zone 3 Remedial Action

The continuing assessment of remedial extraction pumping, seepage impact extent, and natural attenuation in this annual report is the basis for the following recommendations for the Zone 3 corrective action system:

1. Consider terminating extraction pumping, particularly from the upgradient hydrofracture well series (i.e., RW-series), which is likely drawing in background water from the west. Some constituents have higher concentrations in background water, compared to seepage-impacted water. The evaluation will consider the differing objectives of the two sets of extraction wells: (1) those of the upgradient hydrofracture (RW-series) wells are primarily to dewater and recover contaminant mass, and (2) that of the downgradient wells (NW-series) is to form a hydraulic barrier.

    a. Zone 3 extraction wells having yields less than the 1 gpm decommissioning criterion may be recommended to NRC for decommissioning in a future license amendment request. UNC will submit license amendment requests as needed in 2020 to decommission recovery and monitoring wells that do not meet operating criteria.

    b. Declining yields from the current extraction-well array indicate that hydraulic control is temporary. This has always been the case for pumping in Zone 3. Zone 3 saturated thicknesses are quite low (especially considering well losses), and any future pumping to reduce the pressure head will obtain only limited short-term results. Because the bedrock slope drives groundwater flow to the north, there is an irreducible elevation head that cannot be decreased by pumping. UNC recommends that consideration be given to other regulatory tools to manage the inherent physical limitations to the Zone 3 bedrock-groundwater system (e.g., ACLs, TI Waivers, MNA, and ICs).

2. Monitoring wells that do not meet performance criteria associated with low flow groundwater sampling methods (which limits the ability to collect representative samples) or are otherwise unsuitable should be decommissioned and/or removed from the monitoring program. In Zone 3, these wells include, but may not be limited to, Well 517 (POC in Zone 3), Well 504 B (dry), and Well 446 (water level is below the bottom of the screened interval). The collection of water samples and water levels from Well 420 should be suspended because samples are no longer representative of Zone 3, until such time that the water level elevation at this well is above the base of Zone 3. Well 420 may be influenced by active pumping of the RW-series wells, so it could also become relevant again if pumping were to be terminated. UNC may submit a license amendment request to NRC that will specify recommended modifications to the performance monitoring program, including recommended replacement wells, where applicable and available.

3. Sulfate and TDS should be removed from the Zone 3 monitoring program. Monitoring data indicate that sulfate and TDS concentrations do not exceed revised Site standards in seepage-impacted water outside Section 2.

4. Three sentinel wells were installed at locations north of the Section 36 boundary between December 2019 and January 2020 (see Appendix B, Figure B-2). Information obtained during 2019 suggested that Zone 3 may be deeper at the proposed monitoring locations than previously understood, which was determined to reduce the number of wells needed to meet the monitoring

objectives. Geologic and water quality data should be evaluated to confirm that the monitoring objectives have been met.

5. It is anticipated that seepage-impacted groundwater water will be retarded by pumping from Well NW-5 (to the degree pumping can be maintained). UNC continues to evaluate the chemistry and water levels in the northern Zone 3 wells, which may result in further modifications to the pumping rates to optimize the extraction system operations or to cease operations. NW-2 performance was reduced to the point that pumping was suspended on November 13, 2019.

5.2.3 Recommendations for Closure of Zone 1 Remedial Action

The Zone 1 seepage-impacted area has attained ALARA goals. The predicted performance of the Zone 1 natural attenuation system is summarized on Table 18. Implement the following recommendations toward closure of the Zone 1 corrective action system:

1. As first put forth by the NRC (1996), and further developed in several geochemistry (Earth Tech, 2000c) and annual reports (Earth Tech, 2000e; N.A. Water Systems, 2004, 2005, 2007a), there is no method to achieve the historical EPA standards for sulfate and TDS, which are exceeded in background groundwater. Sulfate, TDS, and manganese concentrations meet the revised EPA cleanup standards in wells outside Section 2 (but continue to exceed standards within Section 2 at Well 515 A). There were twelve exceedances of the NRC standard for nickel, six for chloroform and twelve for selenium, as well as eight exceedances of the EPA cobalt standard during 2019. Zone 1 has already been dewatered to the extent that is feasible. Acknowledging recent variability, metals concentrations have been demonstrated to attenuate in two senses: over time at a given location, and spatially downgradient. It is not appropriate to tie remediation progress to (1) sulfate or TDS concentrations which reflect geochemical equilibrium of the groundwater with gypsum or (2) chloride concentrations that only slightly exceed a standard equivalent to or based on an SMCL. Chloride is a non-hazardous constituent and a secondary contaminant that should not be considered to be an ARAR. Remedial alternatives to be presented in Part III of the SWSFS should be closely coordinated with any necessary TI Waiver(s), ACL applications, and ICs.

2. Monitoring wells that do not meet performance criteria associated with low flow groundwater sampling methods (which limits the ability to collect representative samples) should be decommissioned. In Zone 1, these wells include, but may not be limited to, Well 515 A (non-POC in Zone 1). UNC may submit a license amendment request to NRC that will specify recommended modifications to the performance monitoring program, including recommended replacement wells, where applicable and available.

3. UNC submitted to NRC a license amendment request (GE, 2015) and three subsequent communications that amended, corrected, and resubmitted the request (GE, 2016b; GE, 2017; GE, 2018) that included the removal of Well EPA 02 and POC Wells EPA 04, EPA 05, and EPA 07, all of which are located outside Section 2 in Section 1. The license amendment request was supported by data from the previous sixteen years of post-shutdown monitoring, which indicated a gradual improvement in water from the Zone 1 POC wells (GE, 2015). UNC subsequently withdrew the 2018 request (GE, 2019), pending action by NRC on another license amendment request related to the construction of a mine spoil repository on the tailings impoundments UNC will reconsider making the license amendment request related to performance monitoring as NRC's review of the mine spoil repository amendment request proceeds.

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Figures

NEW MEXICO INSET LEGEND

- Major City
- Church Rock Site Location
- Interstate Highway
- State Boundary

LEGEND

- Approximate Site Location

NOTES:

1. Topographic basemap taken from the United States Geologic Survey 30x60 minute, 1:100,000 scale, Gallup, New Mexico Topographic Map, 1981.
2. Data for New Mexico Inset map taken from ESRI Data & Maps 2002 CD-ROM set.

FIGURE 1

Site Location Map

United Nuclear Corporation
Church Rock Site,
Church Rock, New Mexico

wood.

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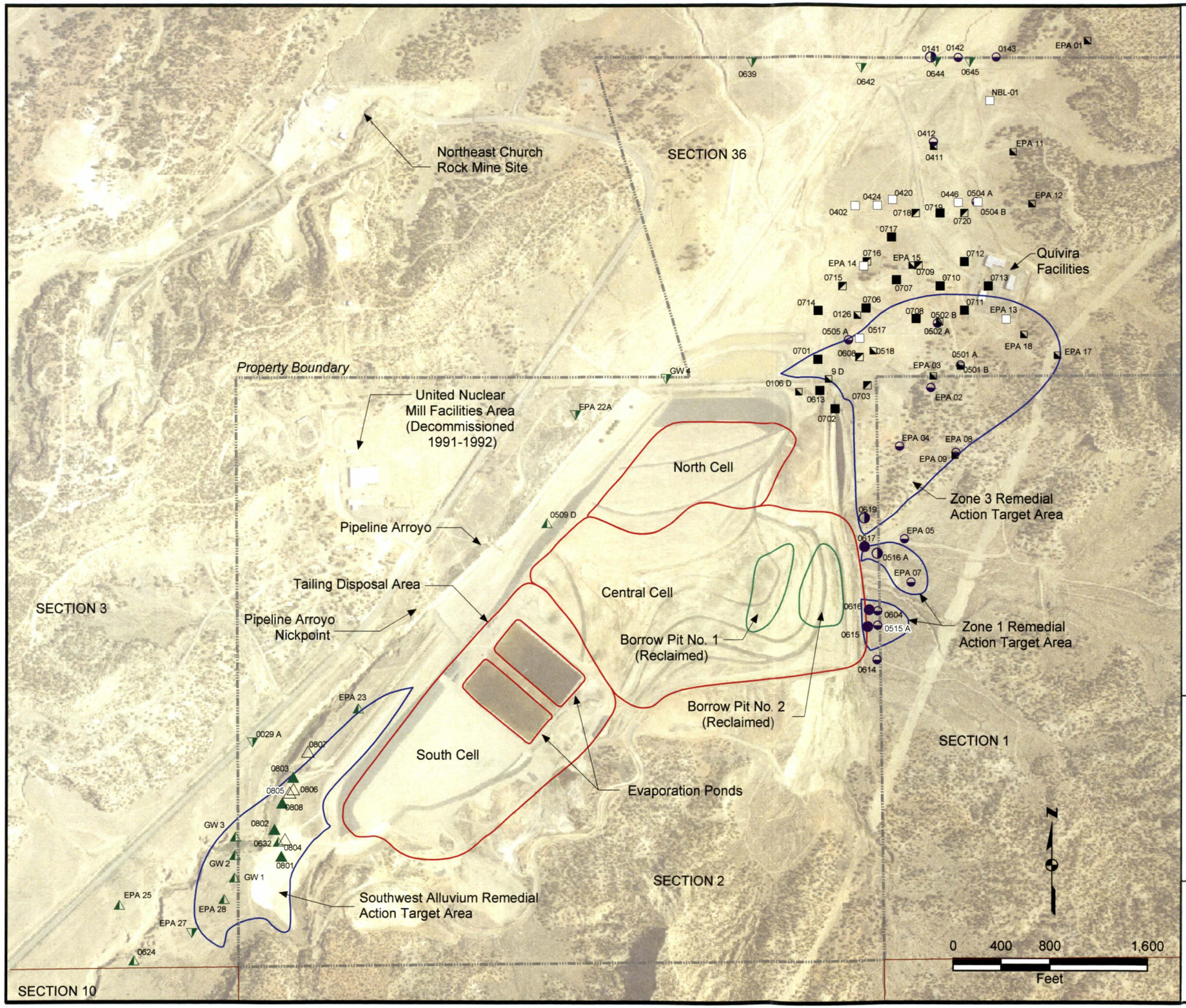

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LEGEND

Southwest Alluvium

- Idled Extraction Well
- Monitoring Well
- Water Level Monitoring Well
- Dry Monitoring Well

Zone 3

- Idled Extraction Well Used for Monitoring
- Decommissioned or Idle Extraction Well
- Monitoring Well
- Dry or Decommissioned Monitoring Well

Zone 1

- Decommissioned Extraction Well
- Decommissioned Monitoring Well
- Monitoring Well

NOTES:

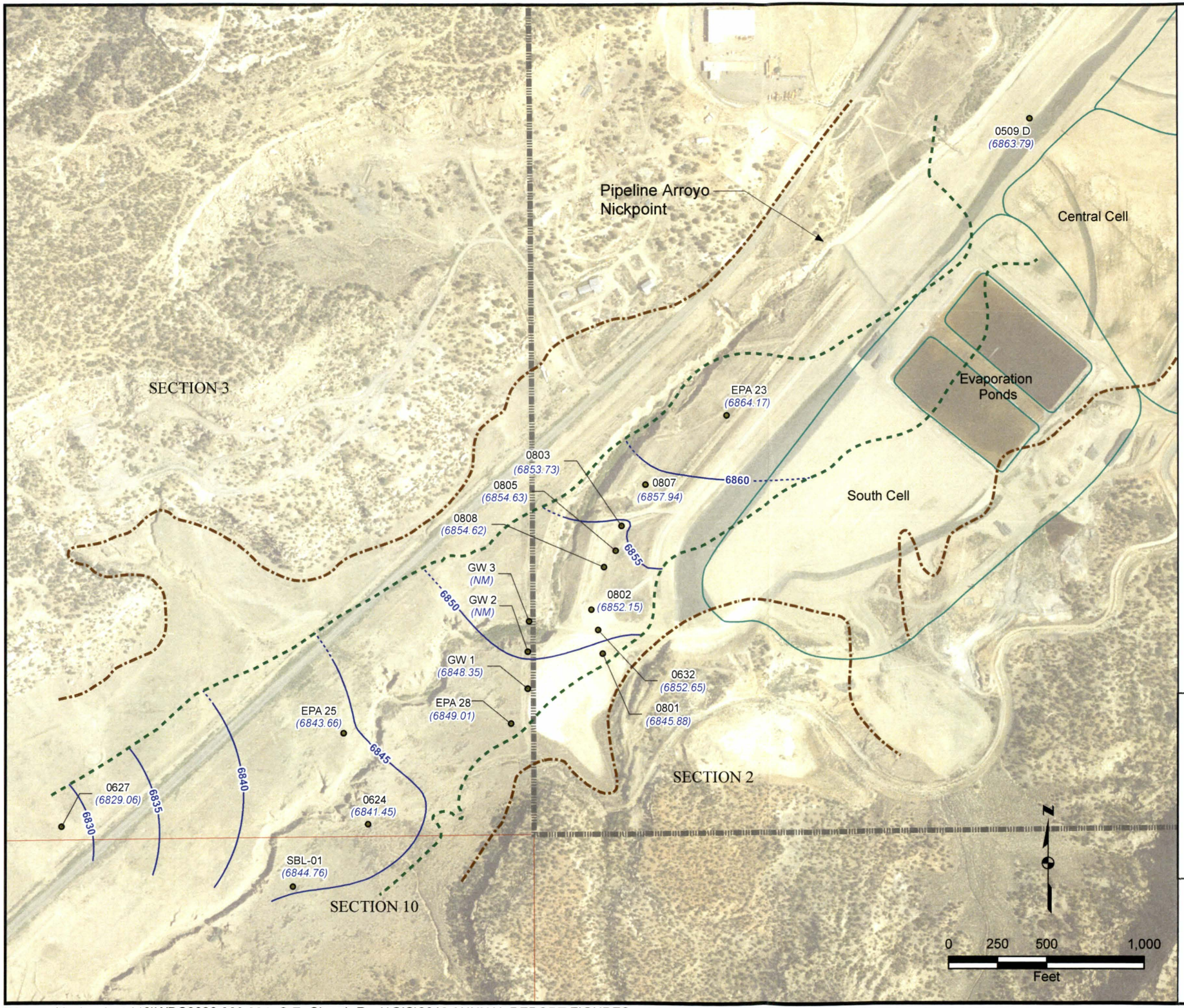
1. Additional supplemental monitoring wells are also sampled.

FIGURE 2

Site Layout and Performance Monitoring Well Locations, 2019 Operating Year

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.



LEGEND

- Southwest Alluvium Monitoring Well
- Approximate Extent of Alluvium
- Approximate Extent of Saturated Alluvium
- Groundwater Elevation Contour
- Inferred Groundwater Elevation Contour
- Cell Boundary
- Property Boundary
- Section Boundary

NOTES

1. Groundwater elevation values are displayed in feet above mean sea level *(6800.12)*.
2. Well names are displayed with black text.
3. Groundwater elevations are shown with blue text and enclosed in parentheses.
4. Aerial photo taken on August 1, 1996.
5. NM- Not Measured

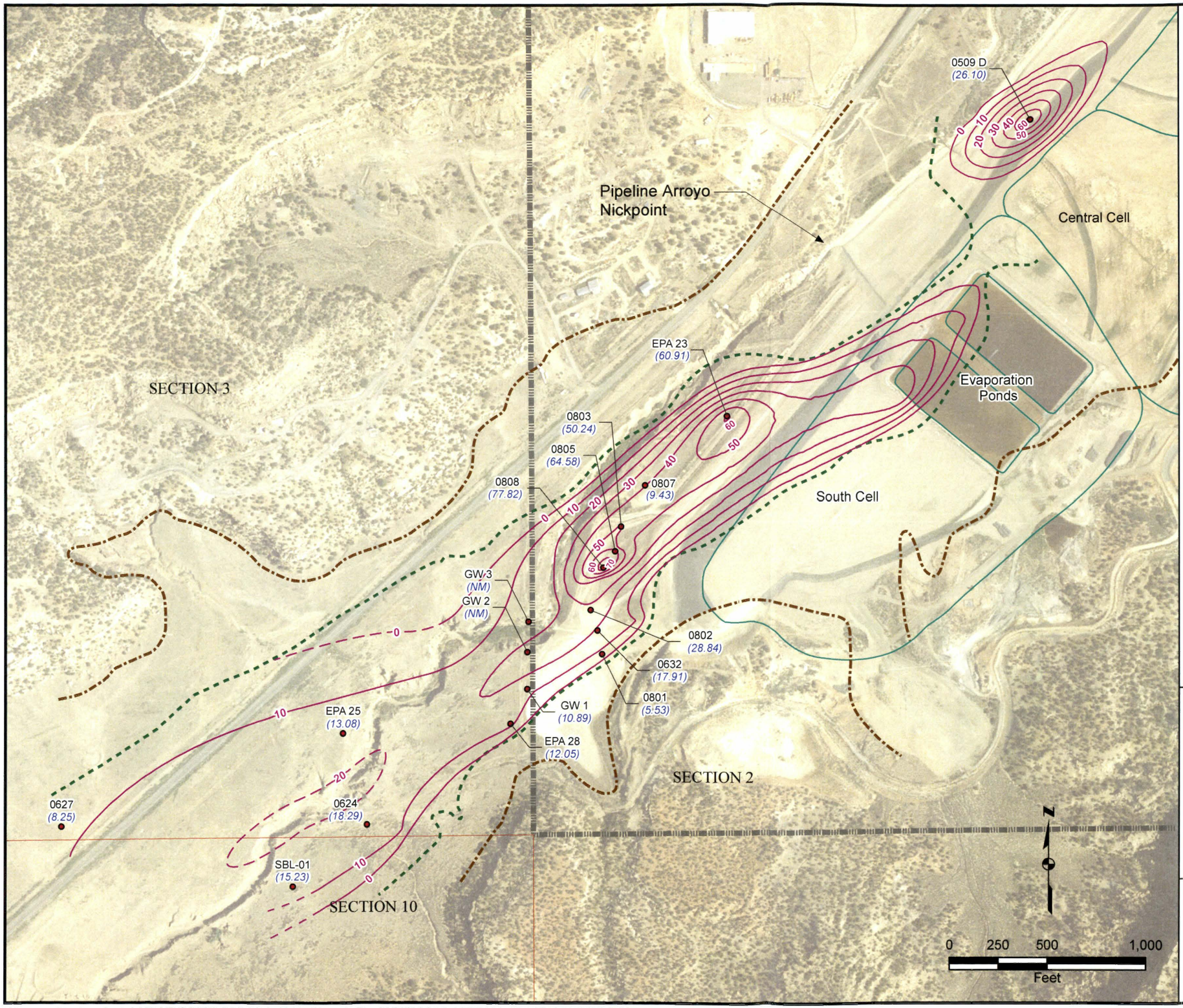
FIGURE 3A

Southwest Alluvium
Potentiometric Surface Map,
October 2019

United Nuclear Corporation Church Rock Site,
Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES



LEGEND

- Southwest Alluvium Monitoring Well
- Approximate Extent of Alluvium
- Approximate Extent of Saturated Alluvium
- Property Boundary
- Section Boundary
- Cell Boundary
- Saturated Thickness Contours (feet)
- Inferred Saturated Thickness Contours (feet)

NOTES

1. Well names are displayed with black text.
2. Saturated thicknesses (feet) are shown with blue text and enclosed in parentheses.
3. Aerial photo taken on August 1, 1996.
4. The posted value of saturated thickness at well 0509 D derives from reference to the screen bottom. The alluvium extends as much as 38 feet below this depth in the vicinity of this well.
5. Saturated thickness at SBL-01 estimated due to incomplete well construction information.
6. NM- Not Measured

FIGURE 3B

Southwest Alluvium
Saturated Thickness Map,
October 2019

United Nuclear Corporation Church Rock Site,
Church Rock, New Mexico

wood.

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Southwest Alluvium Water Levels Over Time

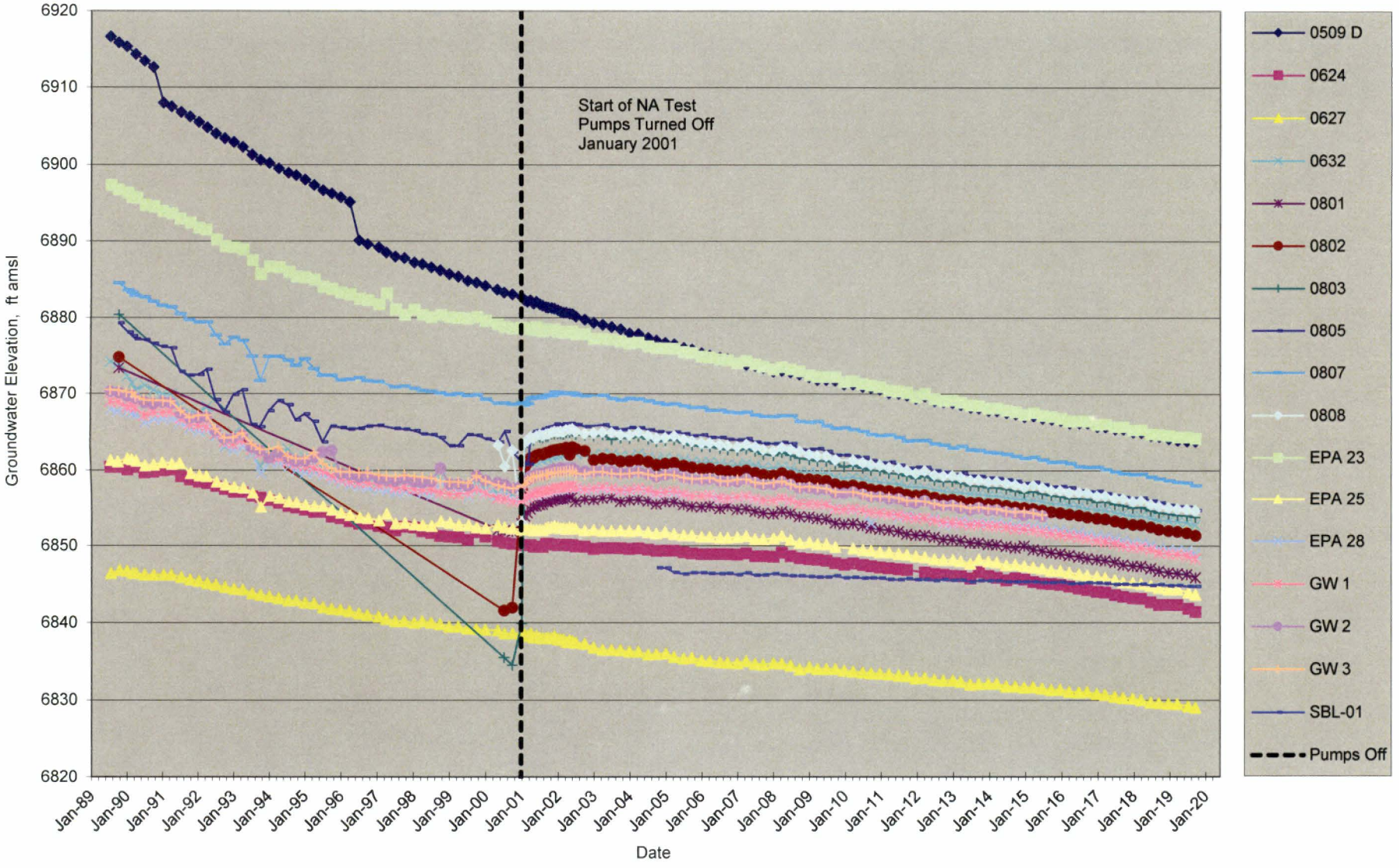


FIGURE 4

United Nuclear Corporation Church Rock Site,
Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

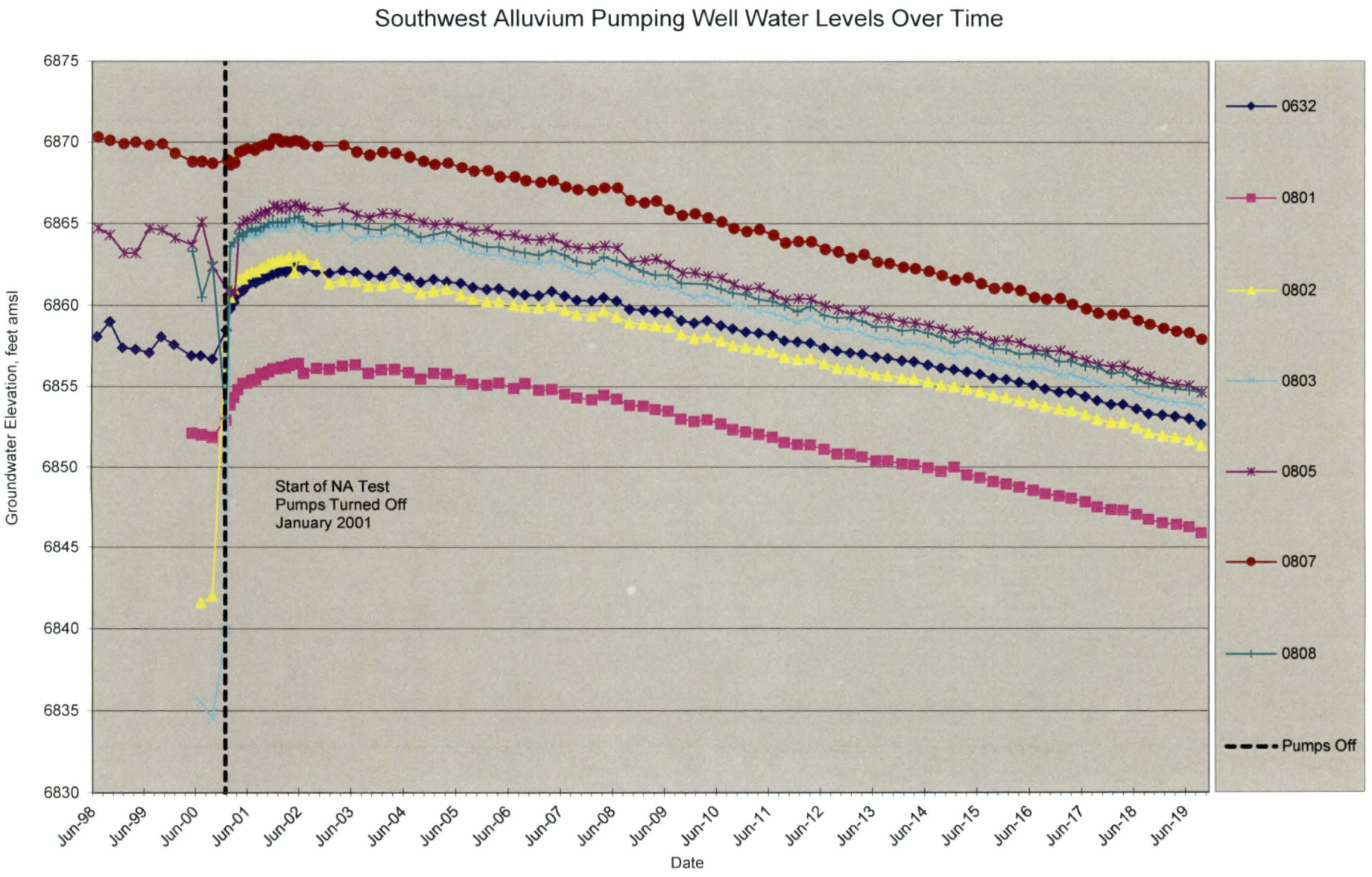
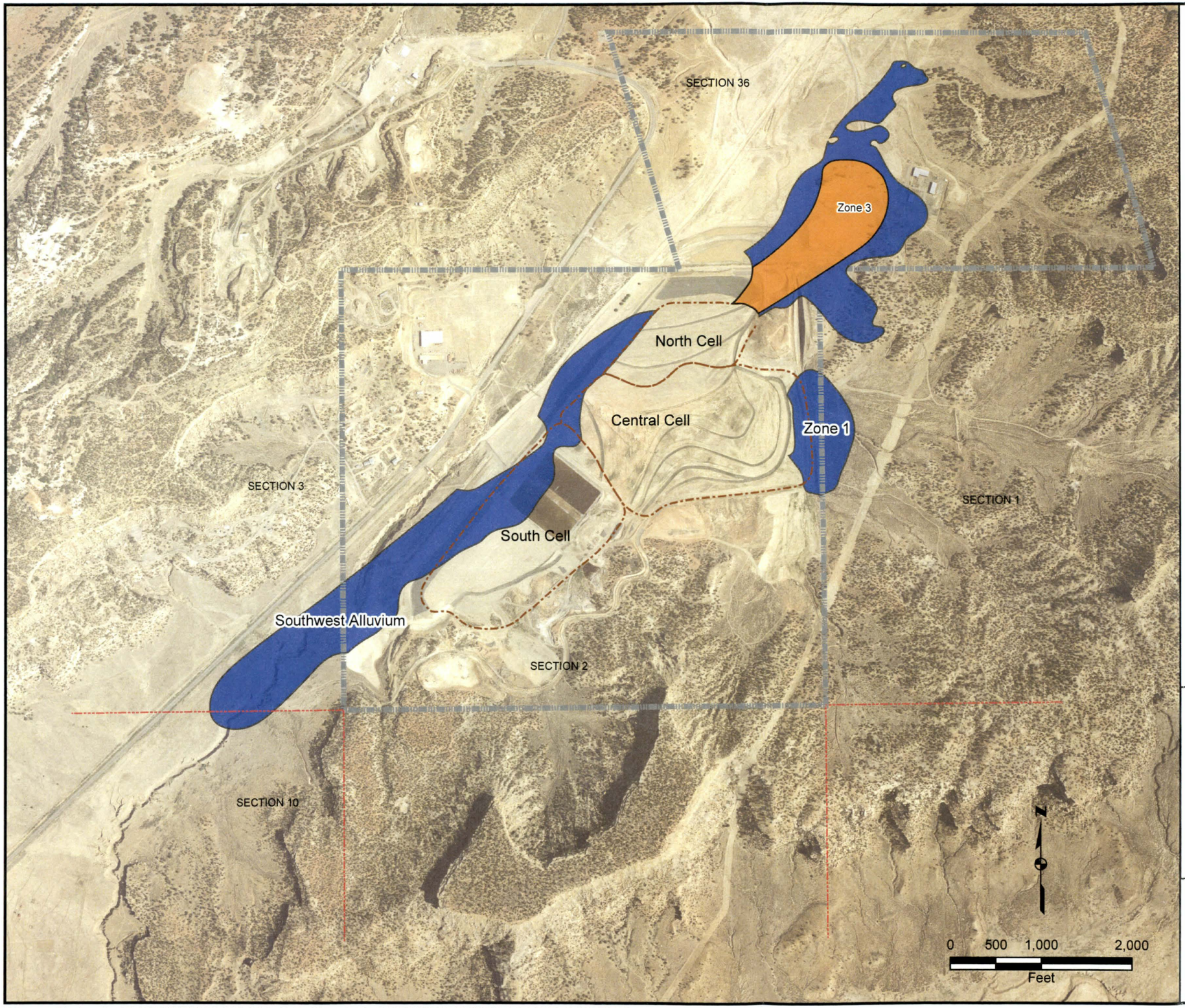


FIGURE 5

United Nuclear Corporation Church Rock Site,
Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES



LEGEND

- Section Boundary
- Property Boundary
- Tailings Pond
- Seepage-Impacted Groundwater
- Groundwater with pH <= 4

Aerial photo taken on August 1, 1996.

FIGURE 6

Extent of Seepage-Impacted Groundwater, October 2019

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

Southwest Alluvium Sulfate Concentrations Over Time

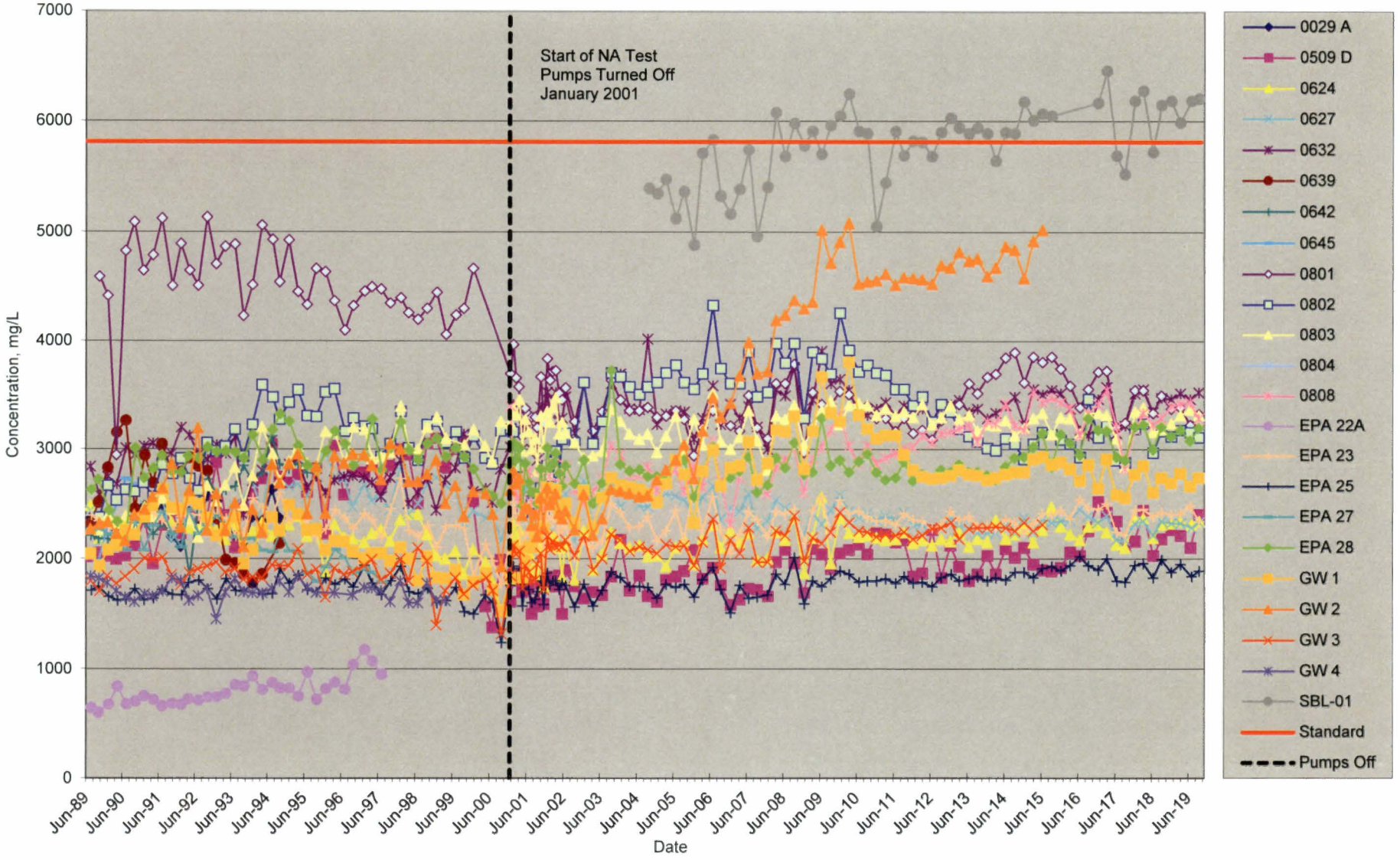
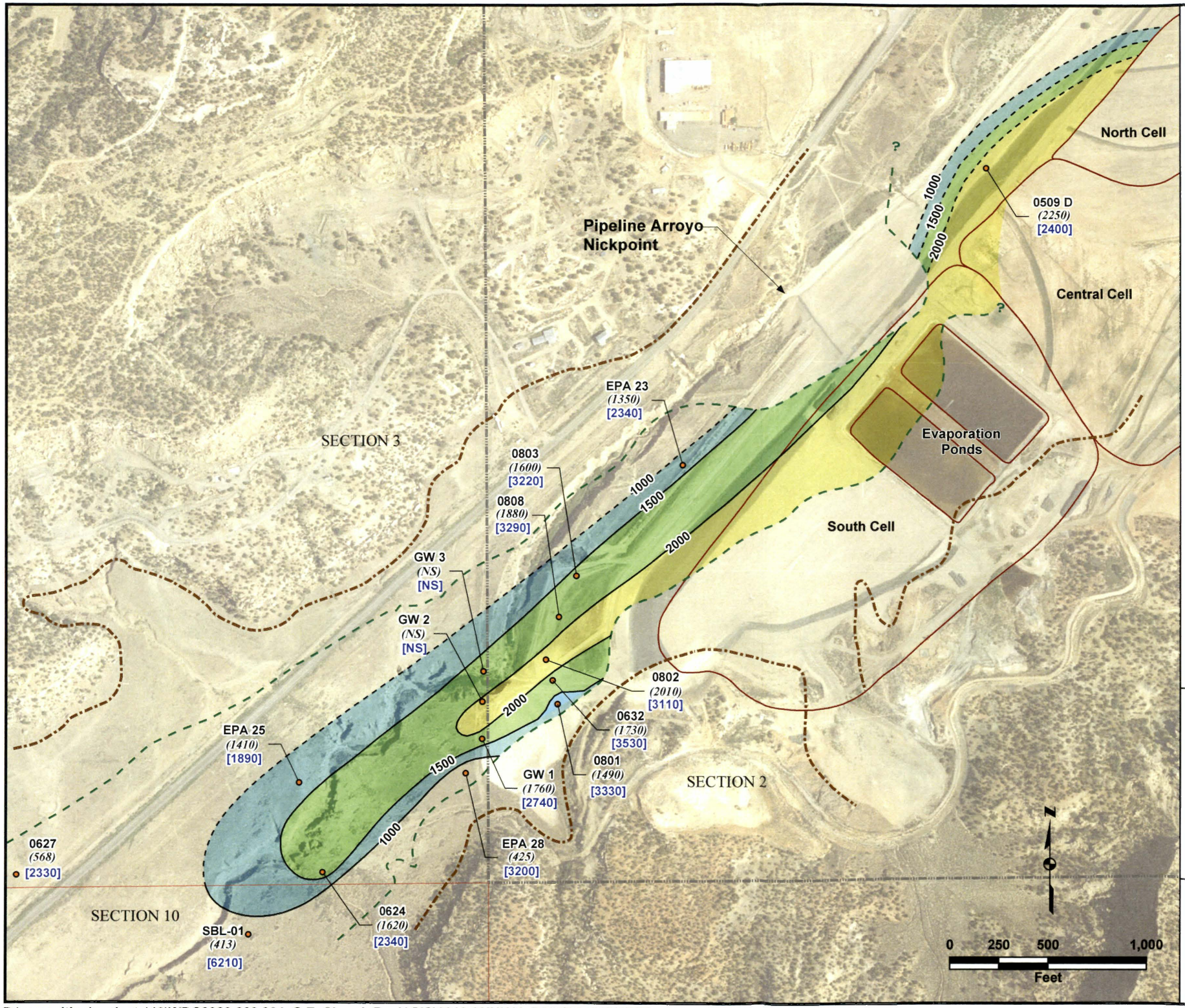


FIGURE 7

United Nuclear Corporation Church Rock Site,
Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES



LEGEND

- Southwest Alluvium Well
- Approximate Extent of Saturated Alluvium
- Approximate Extent of Alluvium
- Bicarbonate Isoconcentration Contour in mg/L
- Inferred Bicarbonate Isoconcentration Contour in mg/L

Bicarbonate Concentrations (mg/L)

- 1000 - 1500
- 1500 - 2000
- >2000
- Property Boundary
- Section Boundary
- Tailings Pond
- NS - Not Sampled

(2330) Bicarbonate result in mg/L

[2180] Sulfate result in mg/L

NOTES

1. Well names are displayed with black text.
2. Aerial photo taken on August 1, 1996.
3. NS- Not Sampled

FIGURE 8

Southwest Alluvium Bicarbonate Isoconcentration Map and Distrubution of Sulfate, October 2019

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

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Primary Components of Total Dissolved Solids in the Southwest Alluvium, October 2019

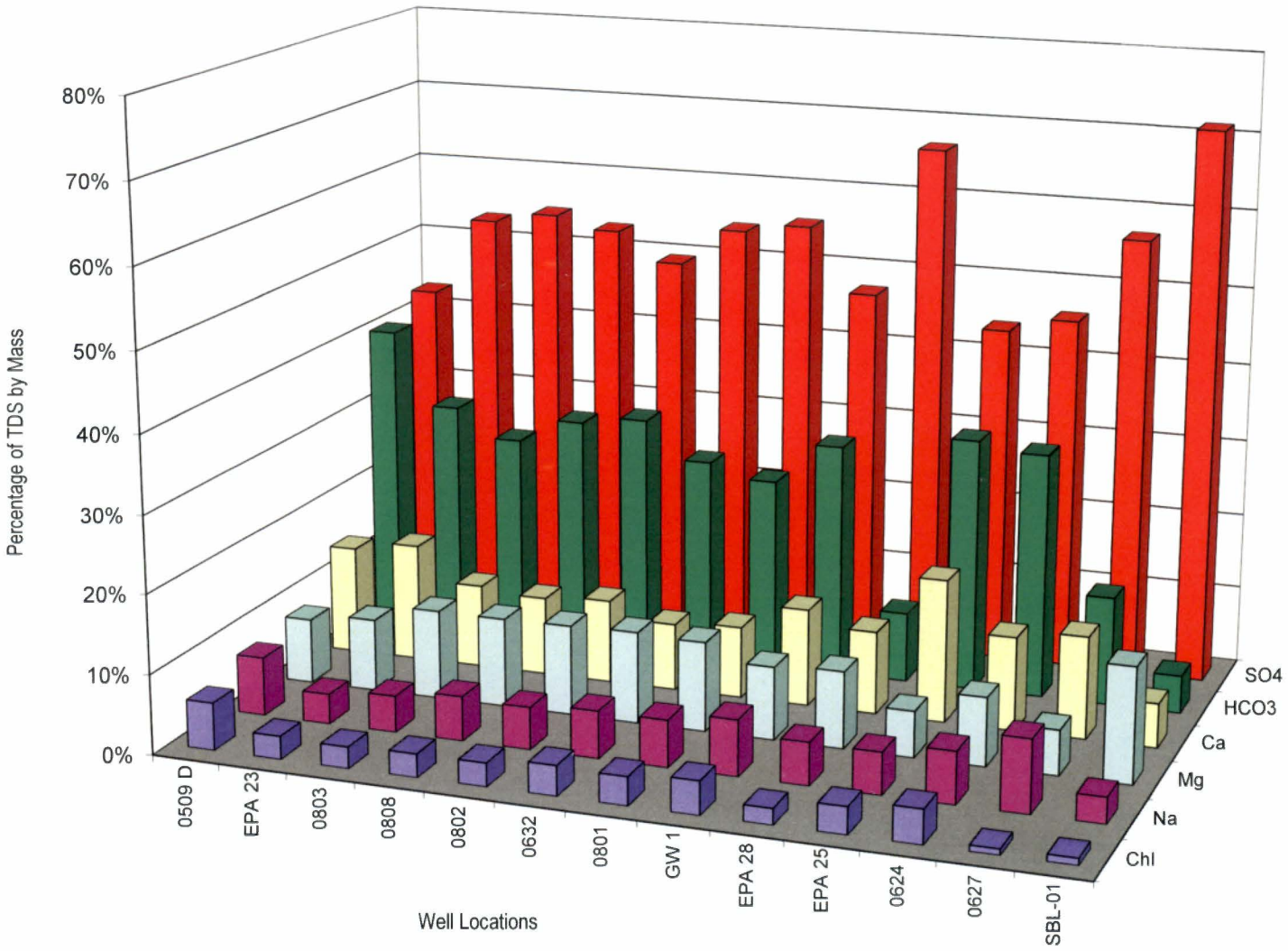


FIGURE 9

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

Southwest Alluvium Total Dissolved Solids Concentrations Over Time

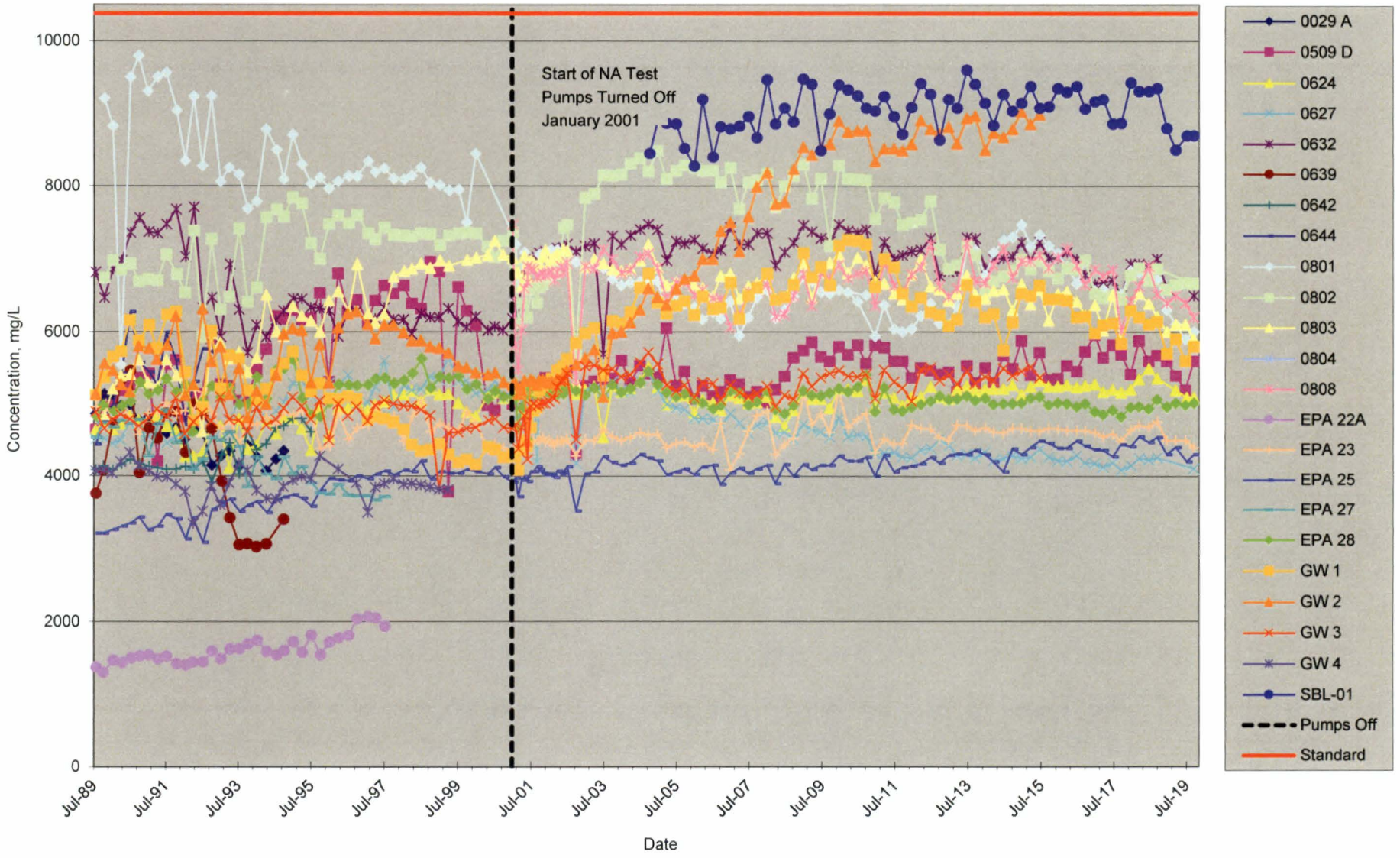


FIGURE 10

United Nuclear Corporation Church Rock Site,
Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

Southwest Alluvium Manganese Concentrations From 1999 Through October 2019

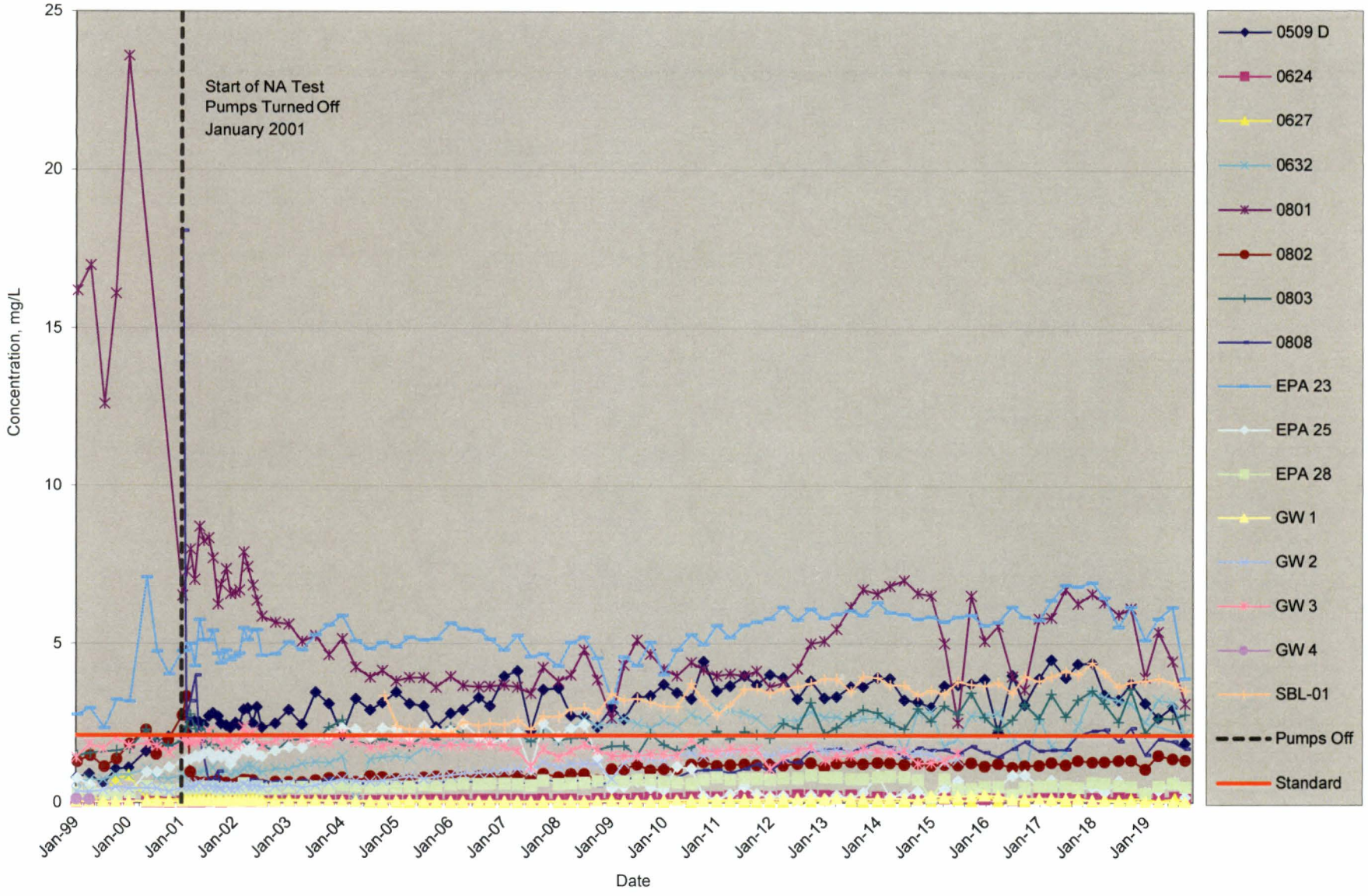


FIGURE 11

United Nuclear Corporation Church Rock Site,
Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

Southwest Alluvium Chloride Concentrations From 1999 Through October 2019

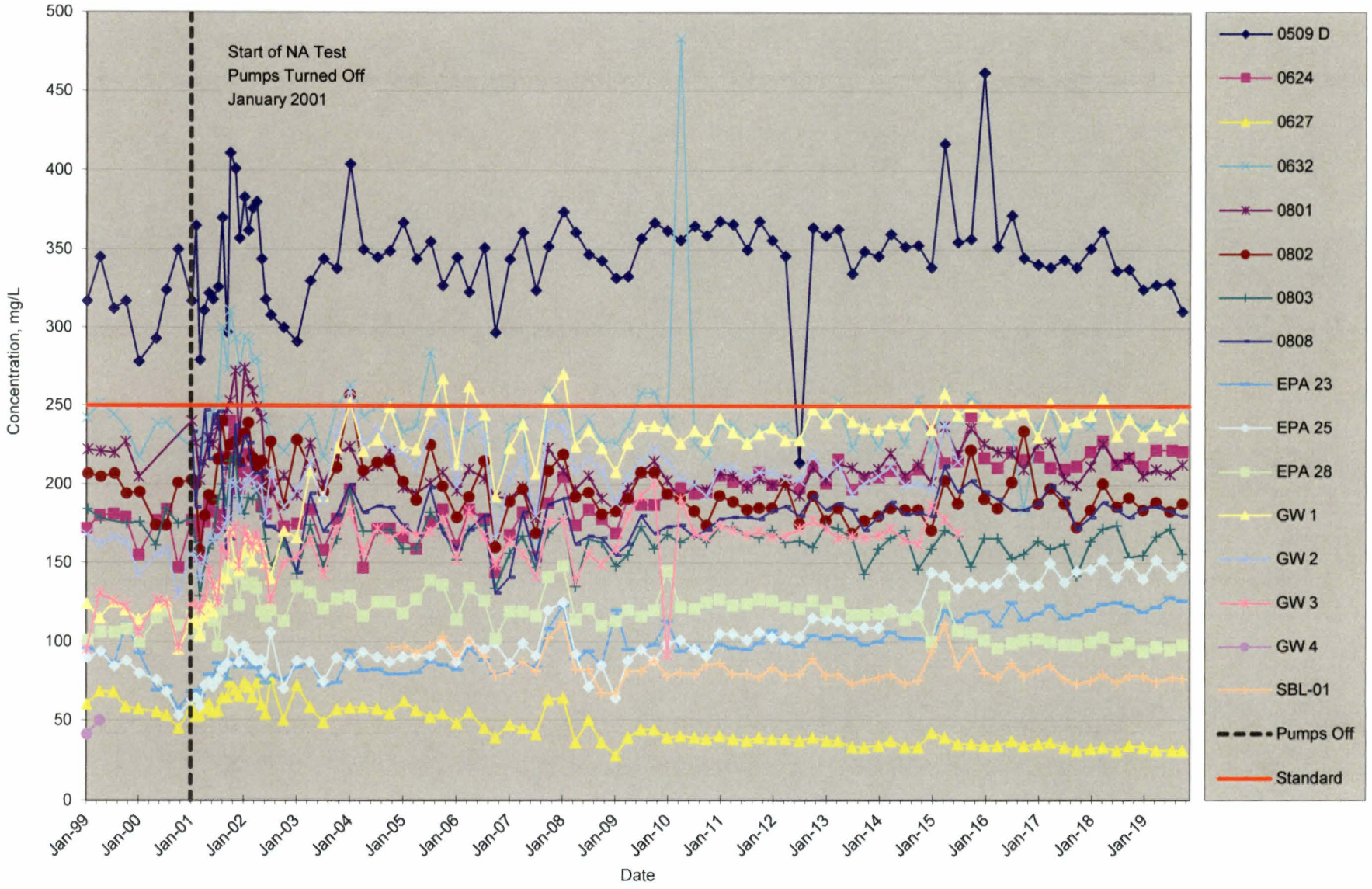


FIGURE 12

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

Calcium and Bicarbonate Concentrations in Selected Background and Seepage-Impacted Wells

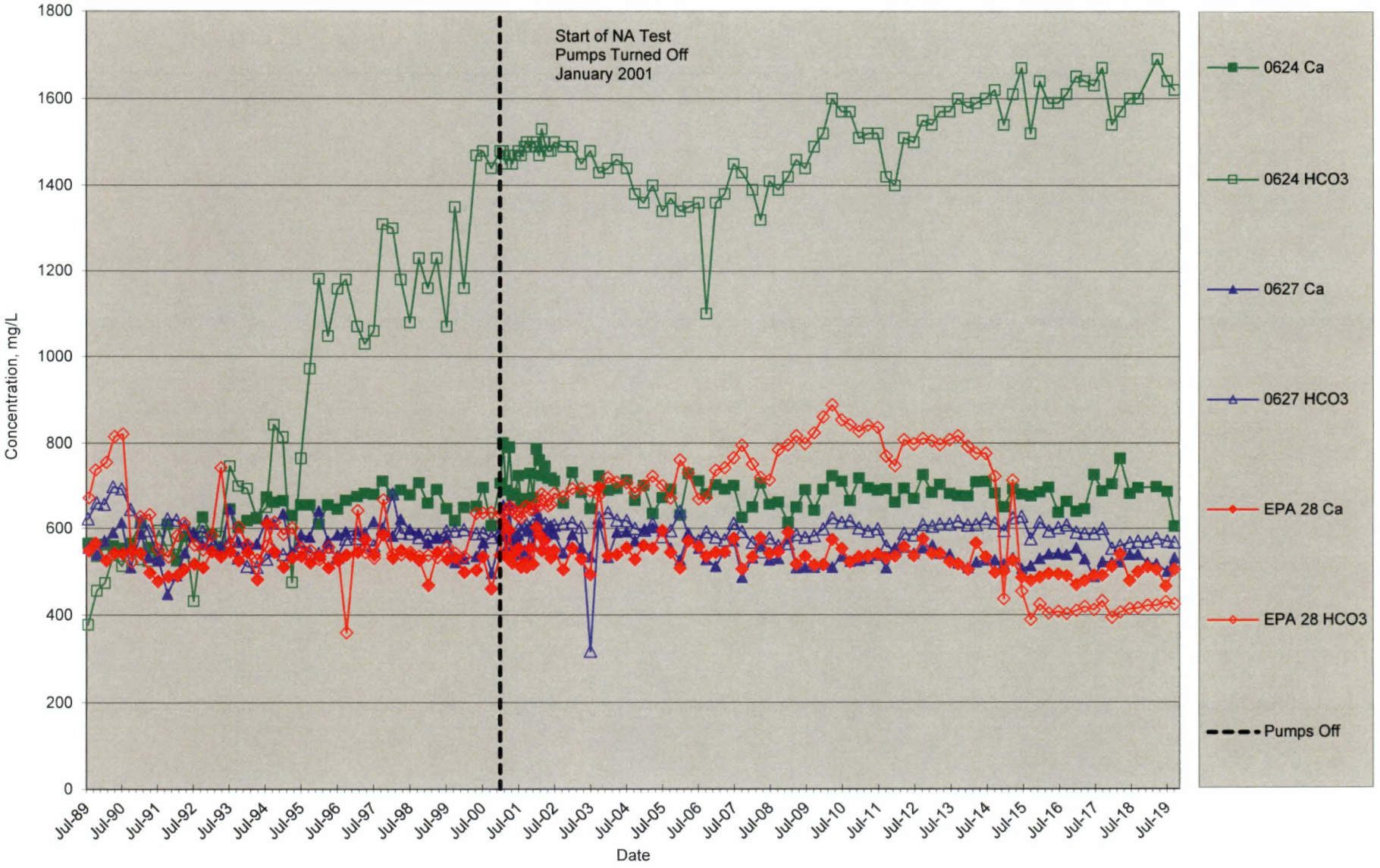


FIGURE 13

United Nuclear Corporation Church Rock Site,
Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

Southwest Alluvium Calcium Concentrations From 1999 Through October 2019

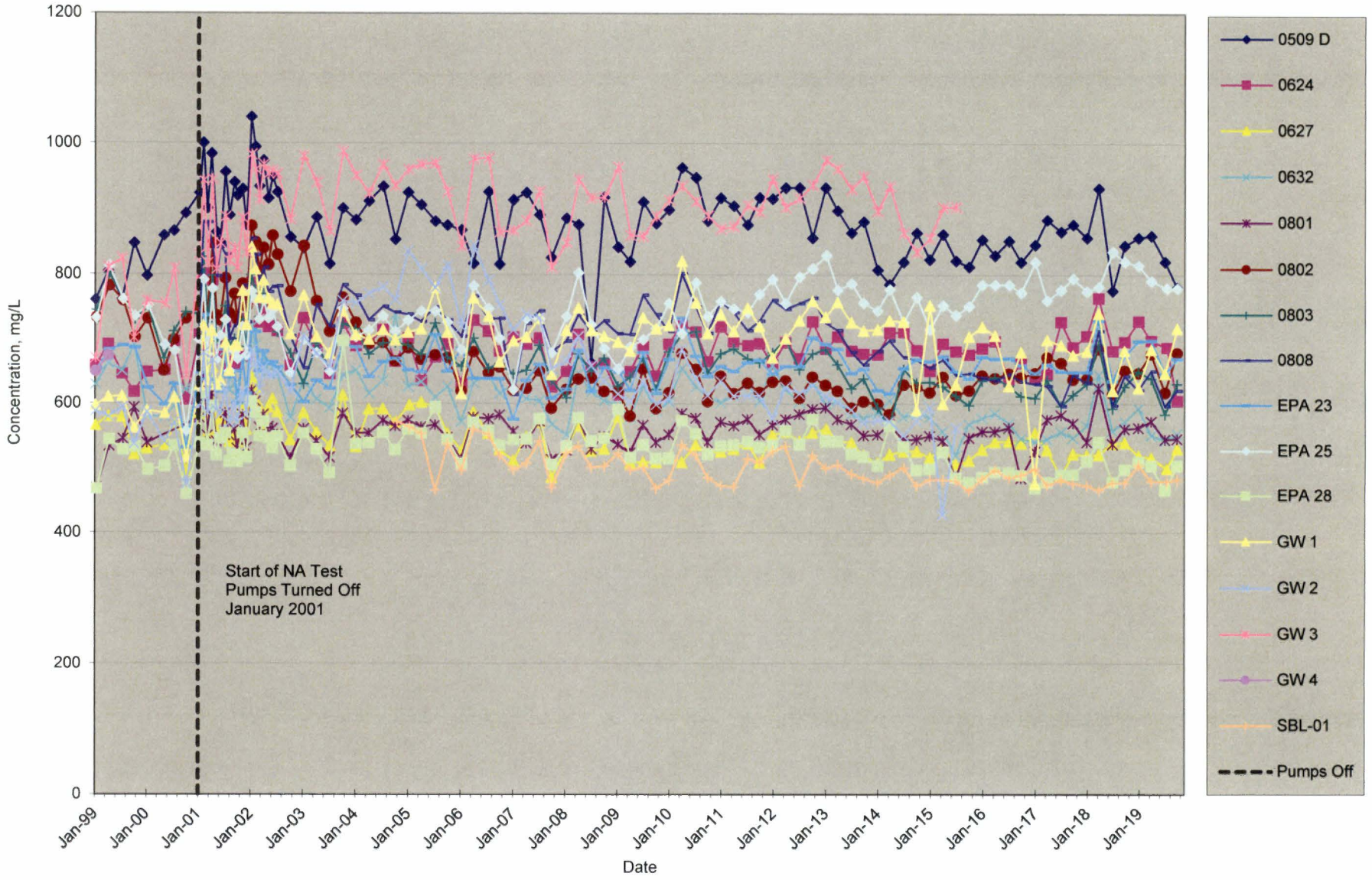


FIGURE 14

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

Southwest Alluvium Bicarbonate Concentrations From 1999 Through October 2019

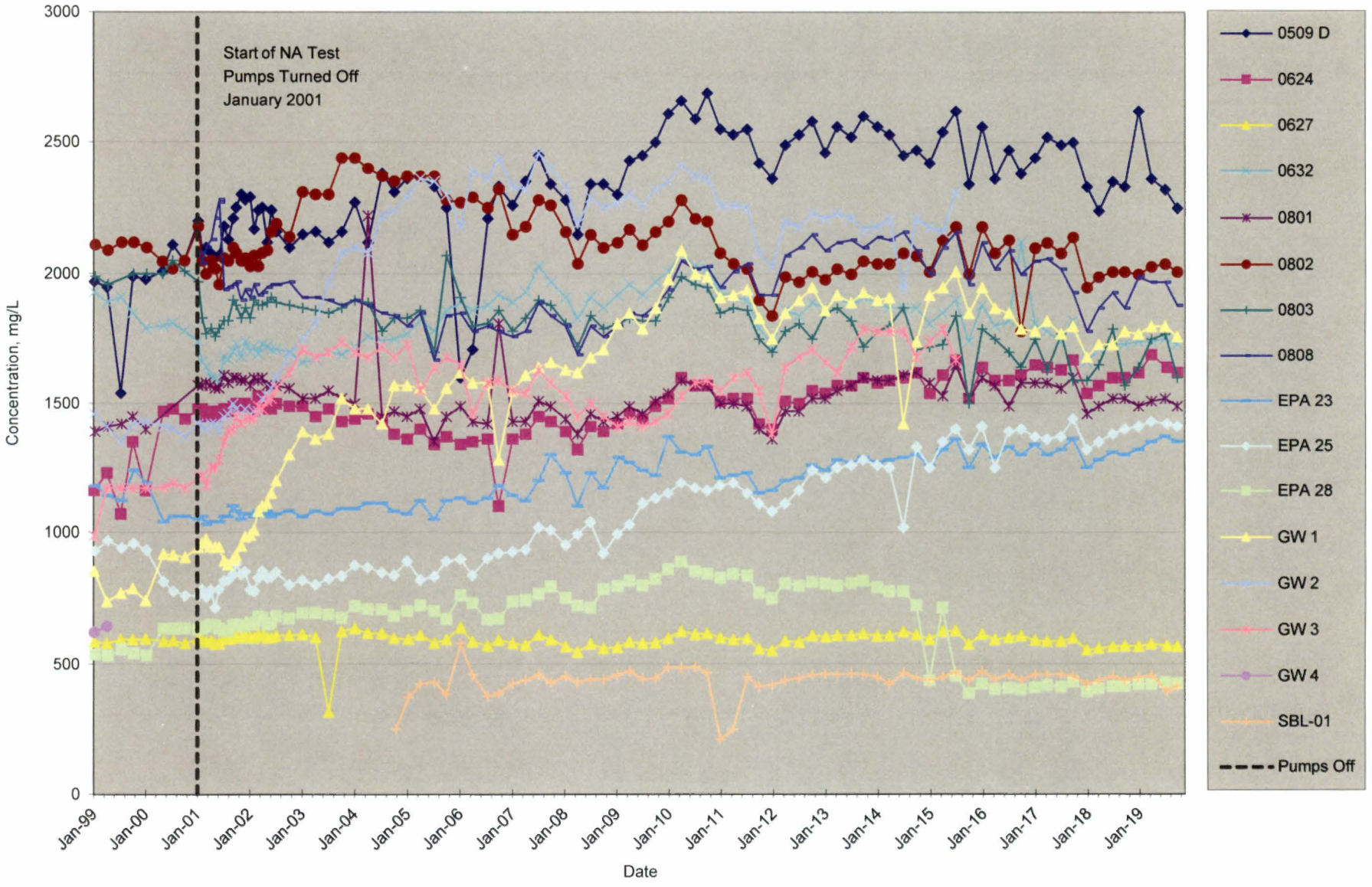


FIGURE 15

United Nuclear Corporation Church Rock Site,
Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

Southwest Alluvium Sulfate Concentrations From 1999 Through October 2019

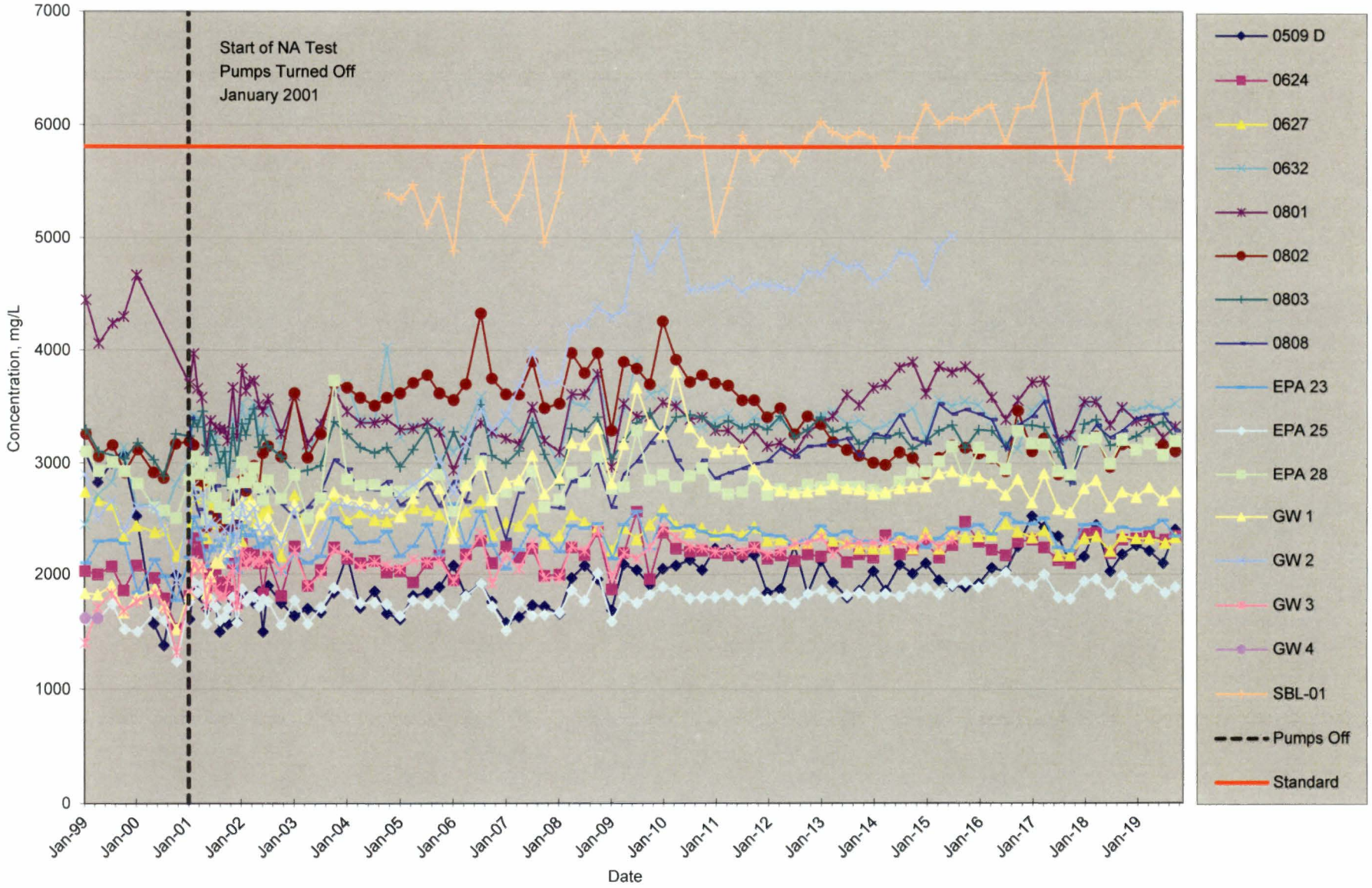


FIGURE 16

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

Southwest Alluvium Total Dissolved Solids Concentrations From 1999 Through October 2019

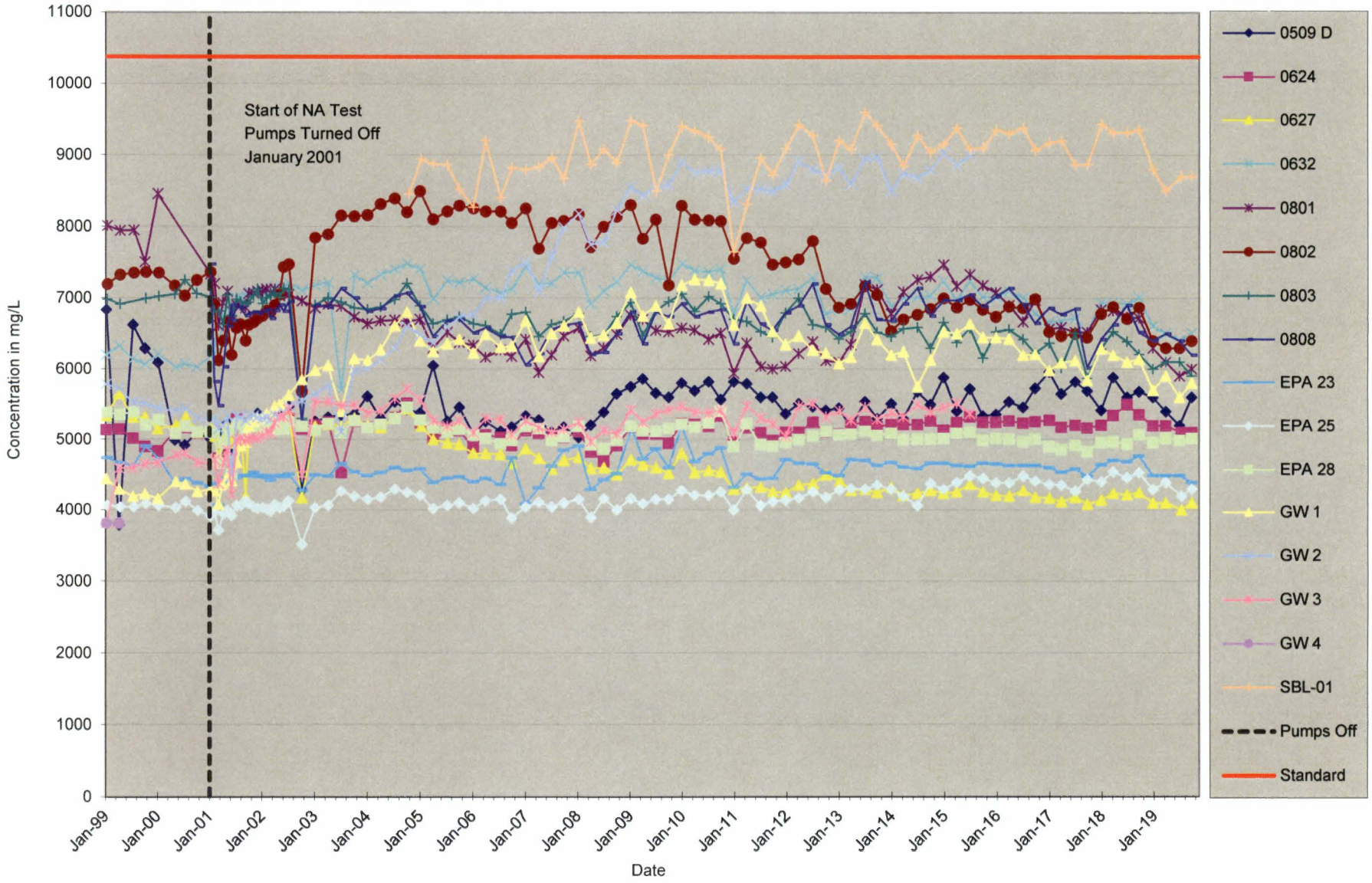


FIGURE 17

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

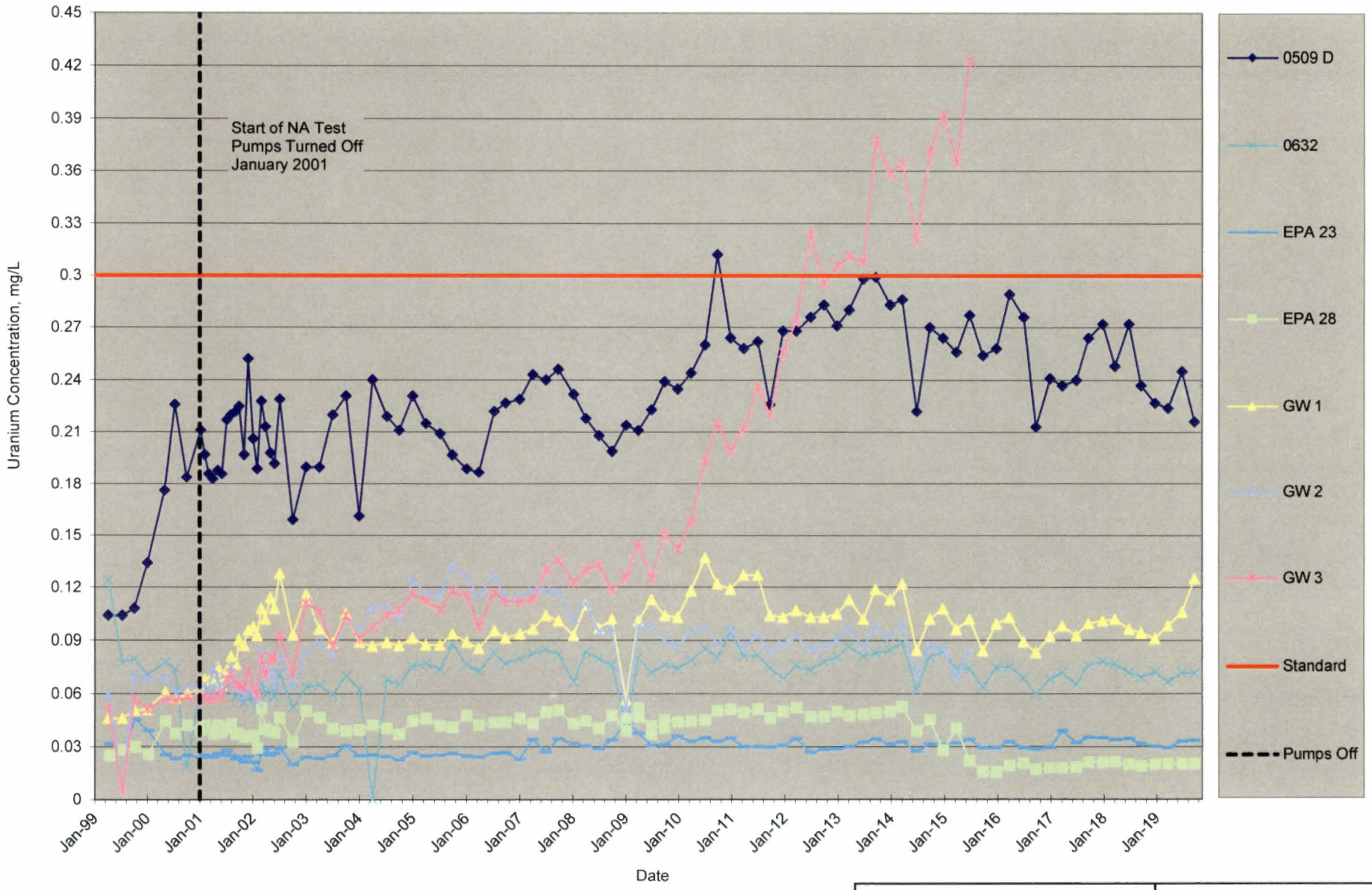


FIGURE 18

United Nuclear Corporation Church Rock Site,
Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

Uranium Concentrations In Selected Southwest Alluvium Wells

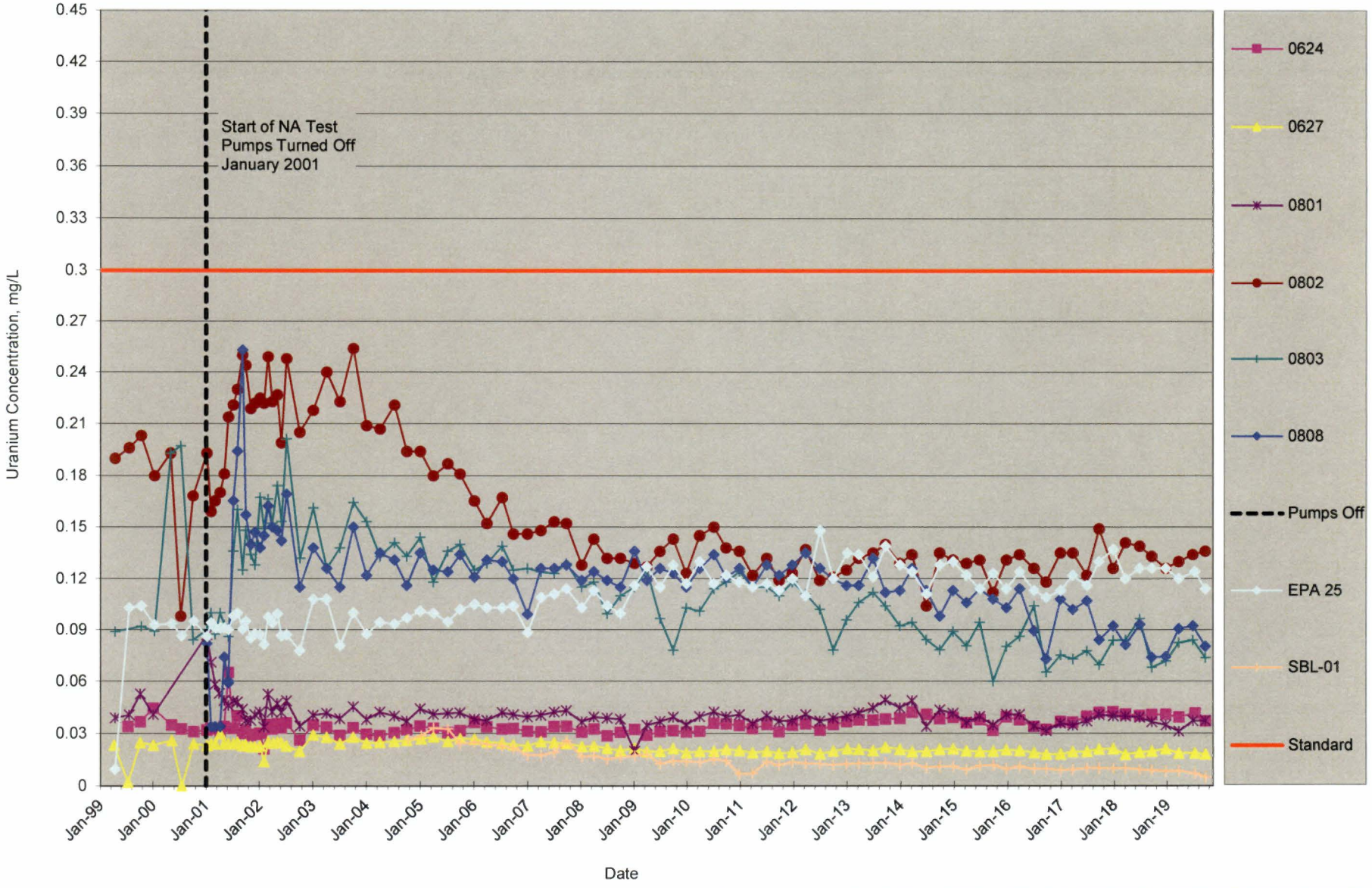


FIGURE 19

United Nuclear Corporation Church Rock Site,
Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

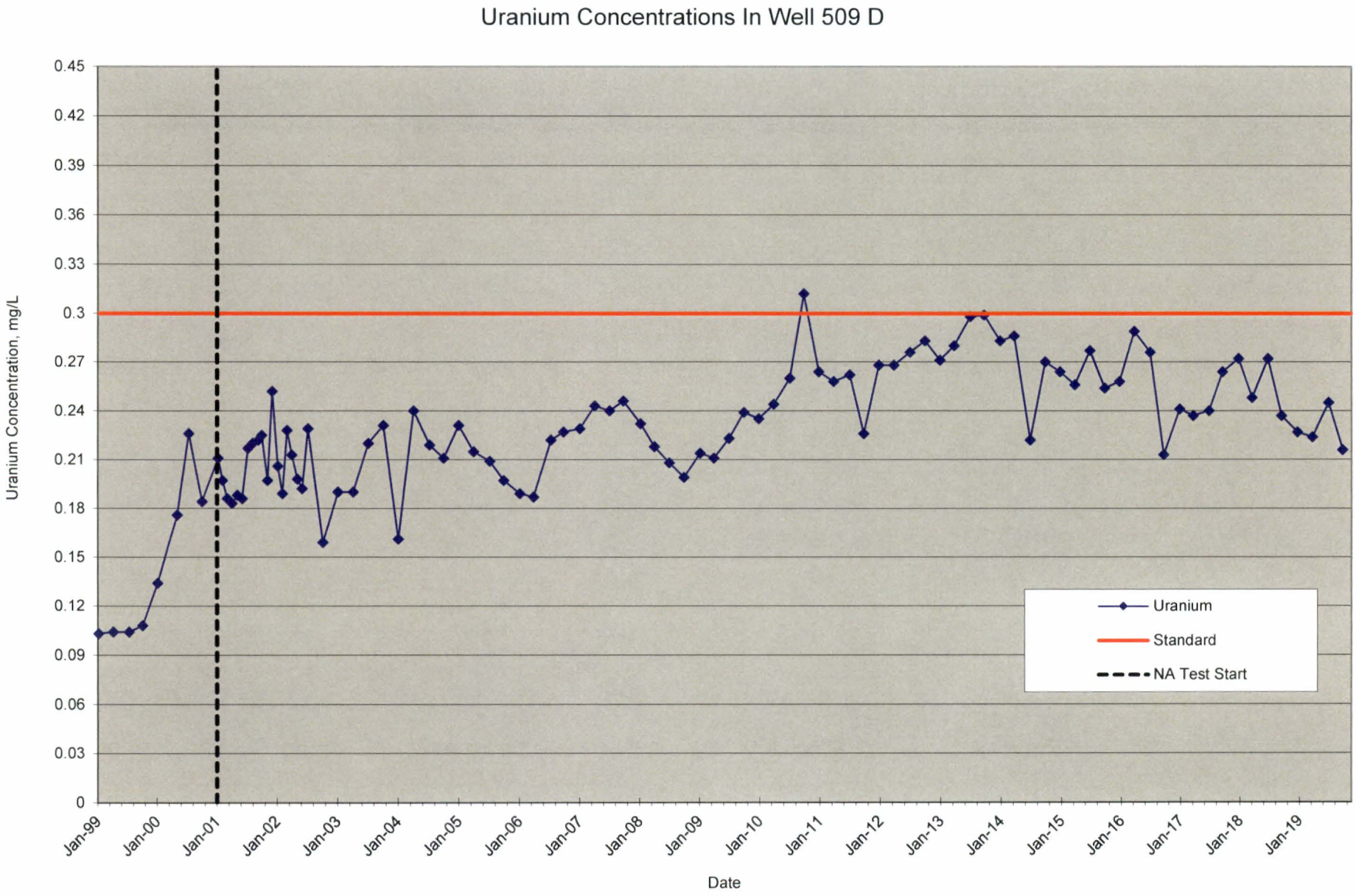


FIGURE 20

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

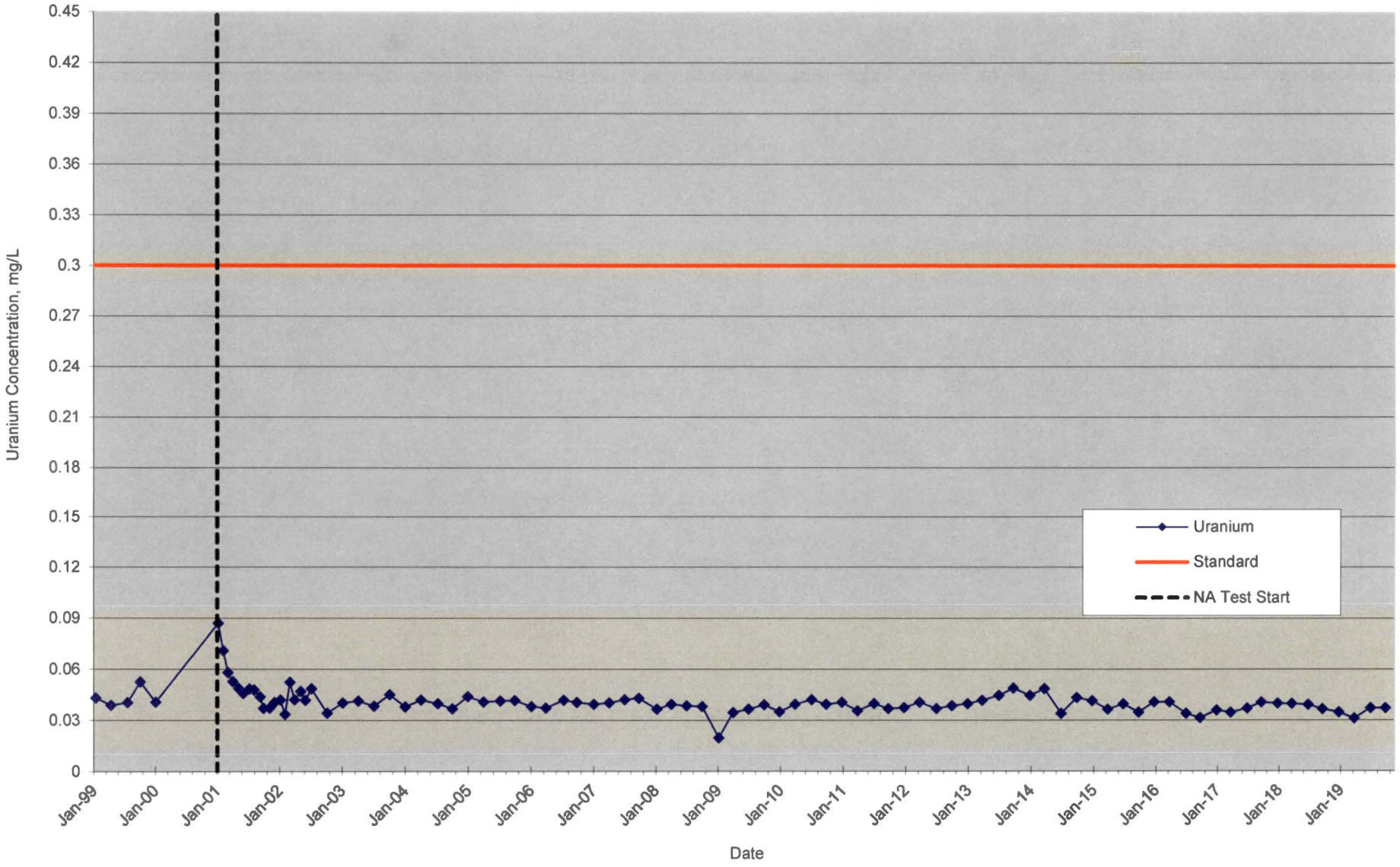


FIGURE 21

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

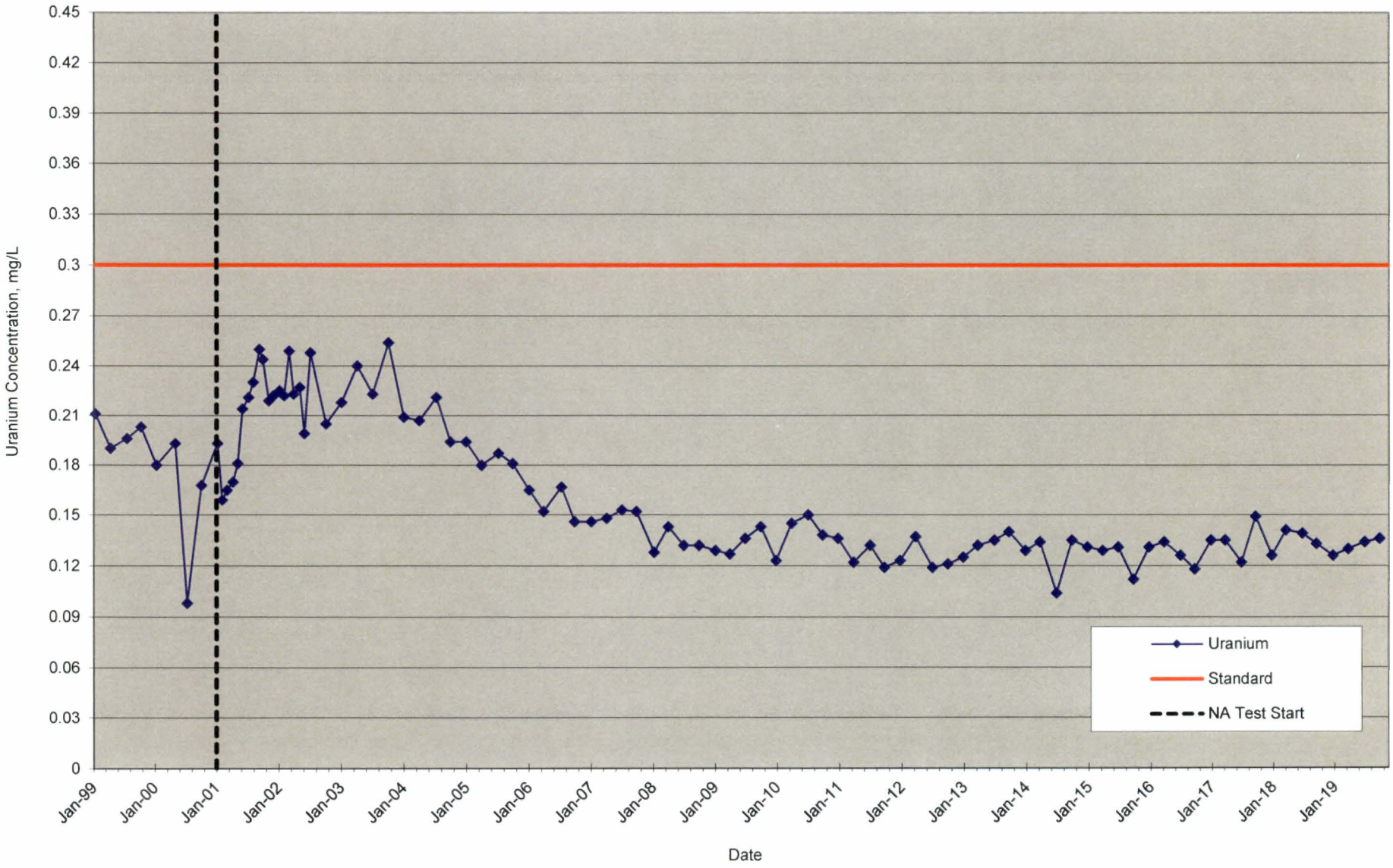


FIGURE 22

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

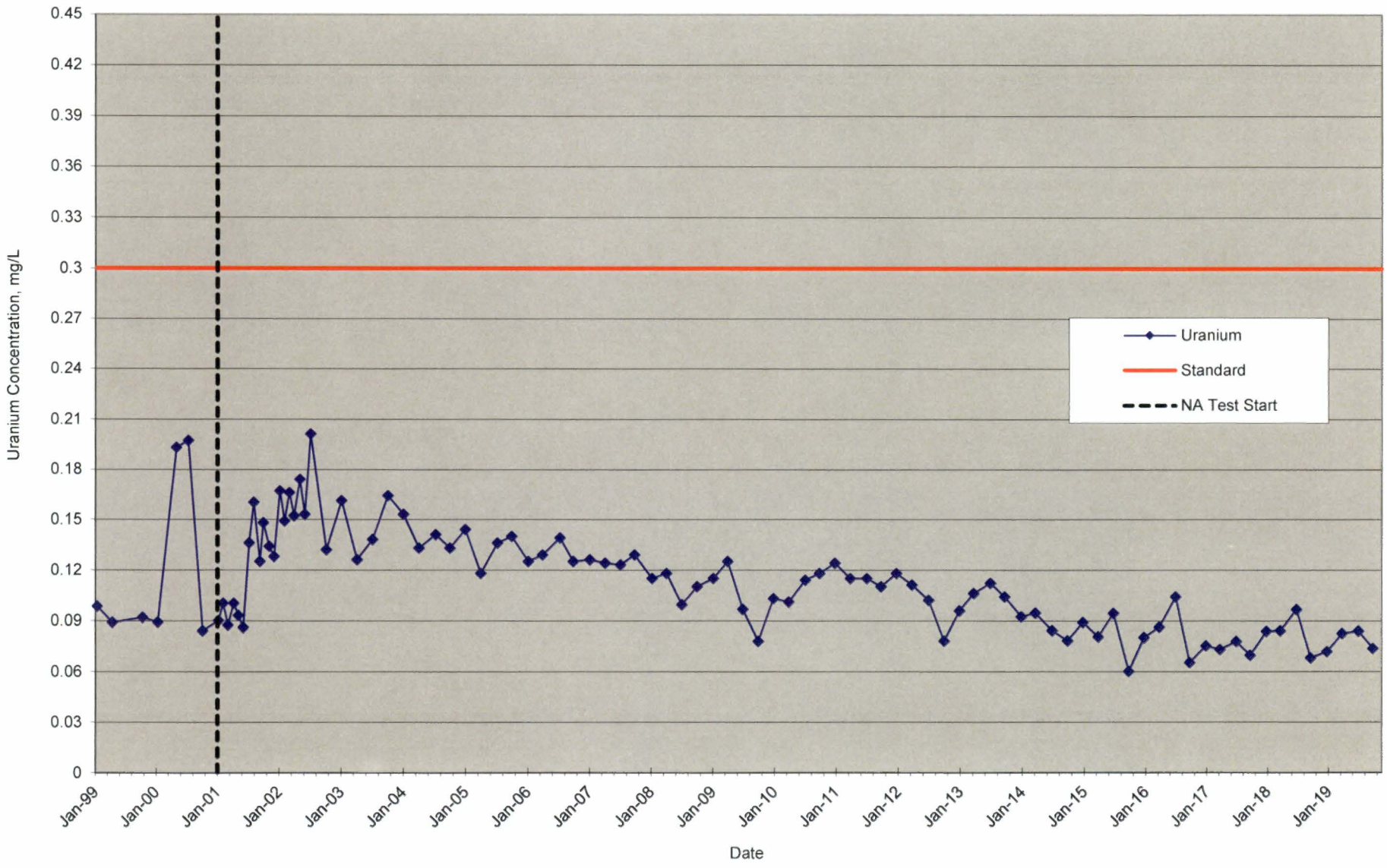


FIGURE 23

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

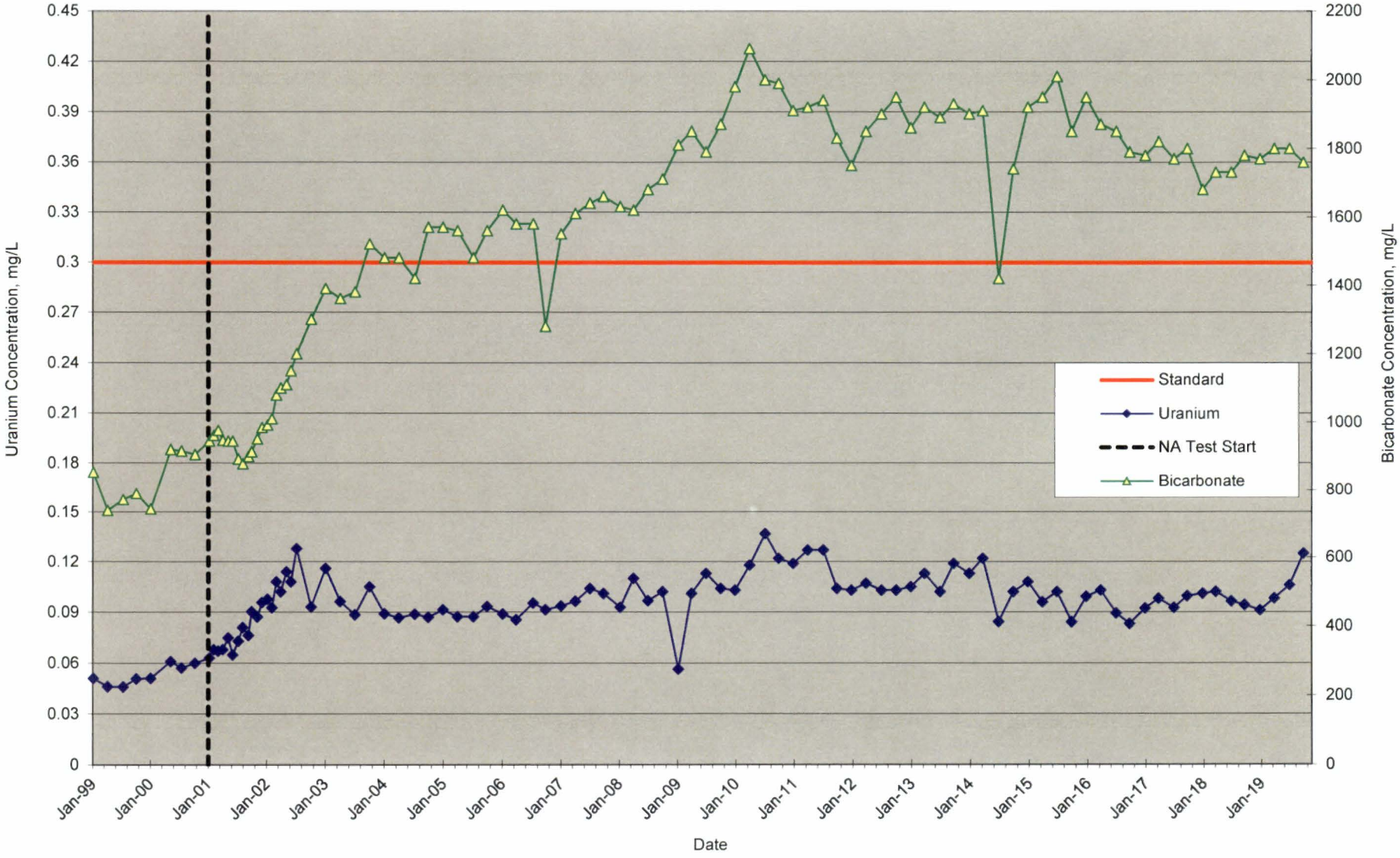


FIGURE 24

United Nuclear Corporation Church Rock Site,
Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

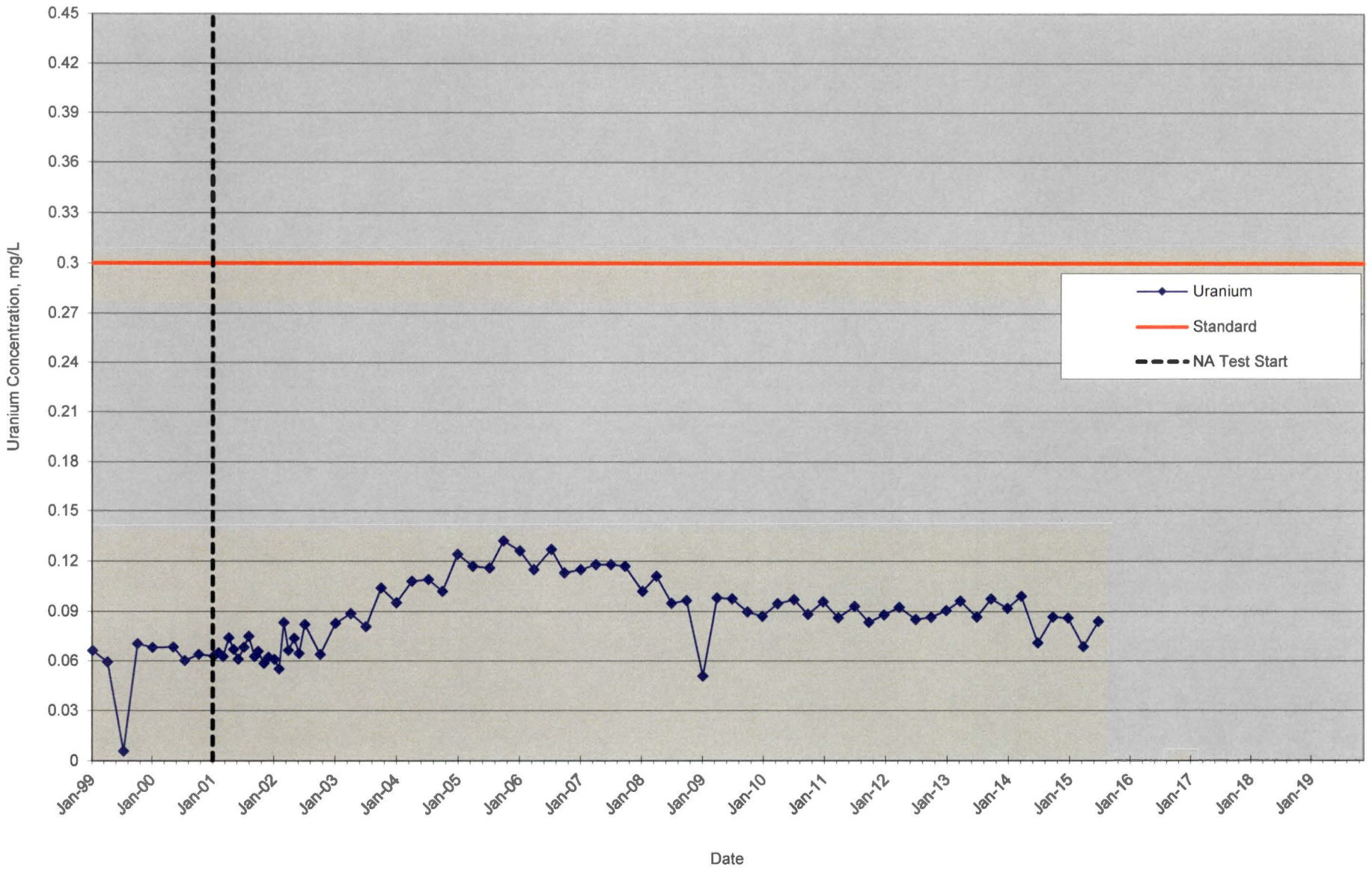


FIGURE 25

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

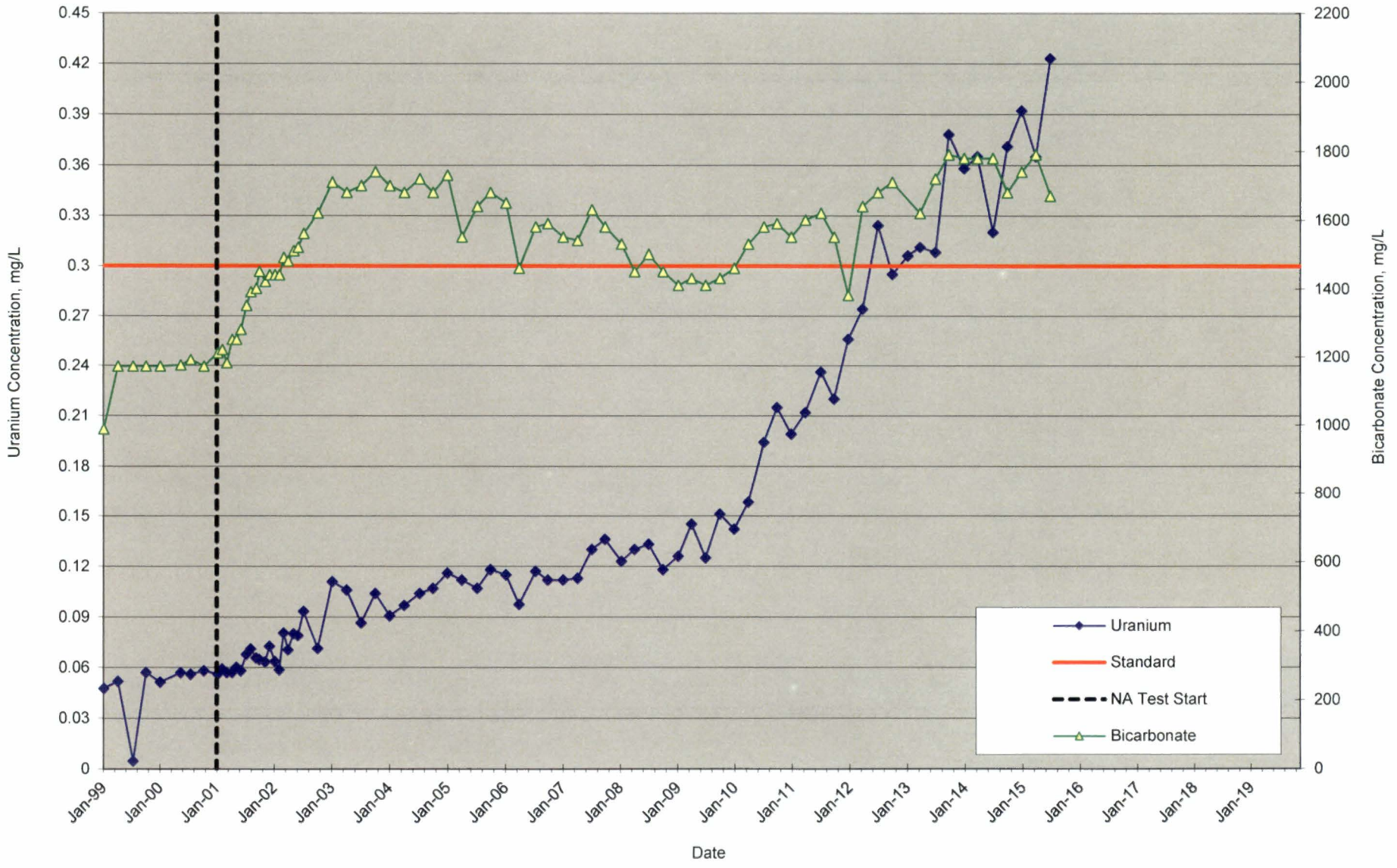


FIGURE 26

United Nuclear Corporation Church Rock Site,
Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

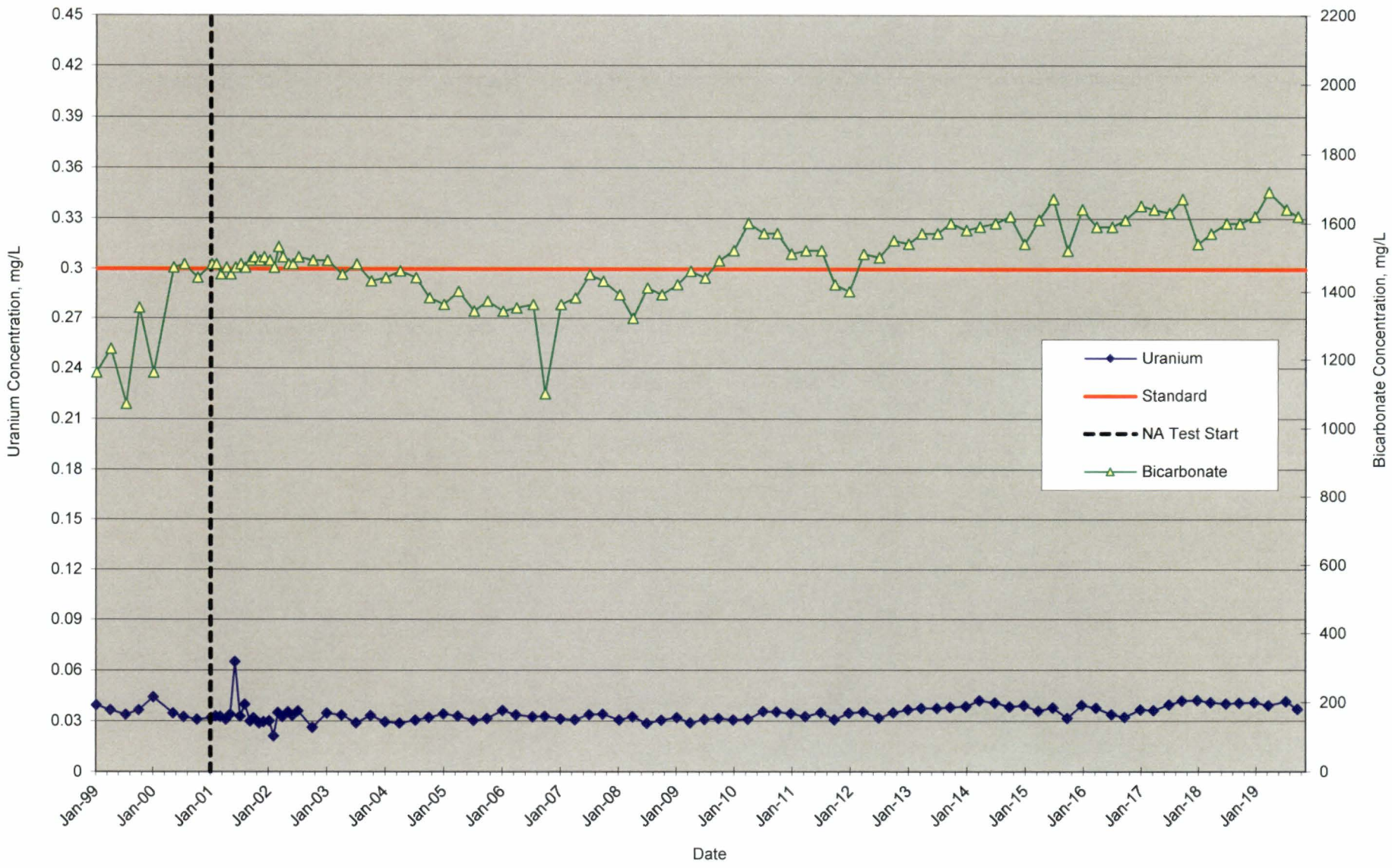


FIGURE 27

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

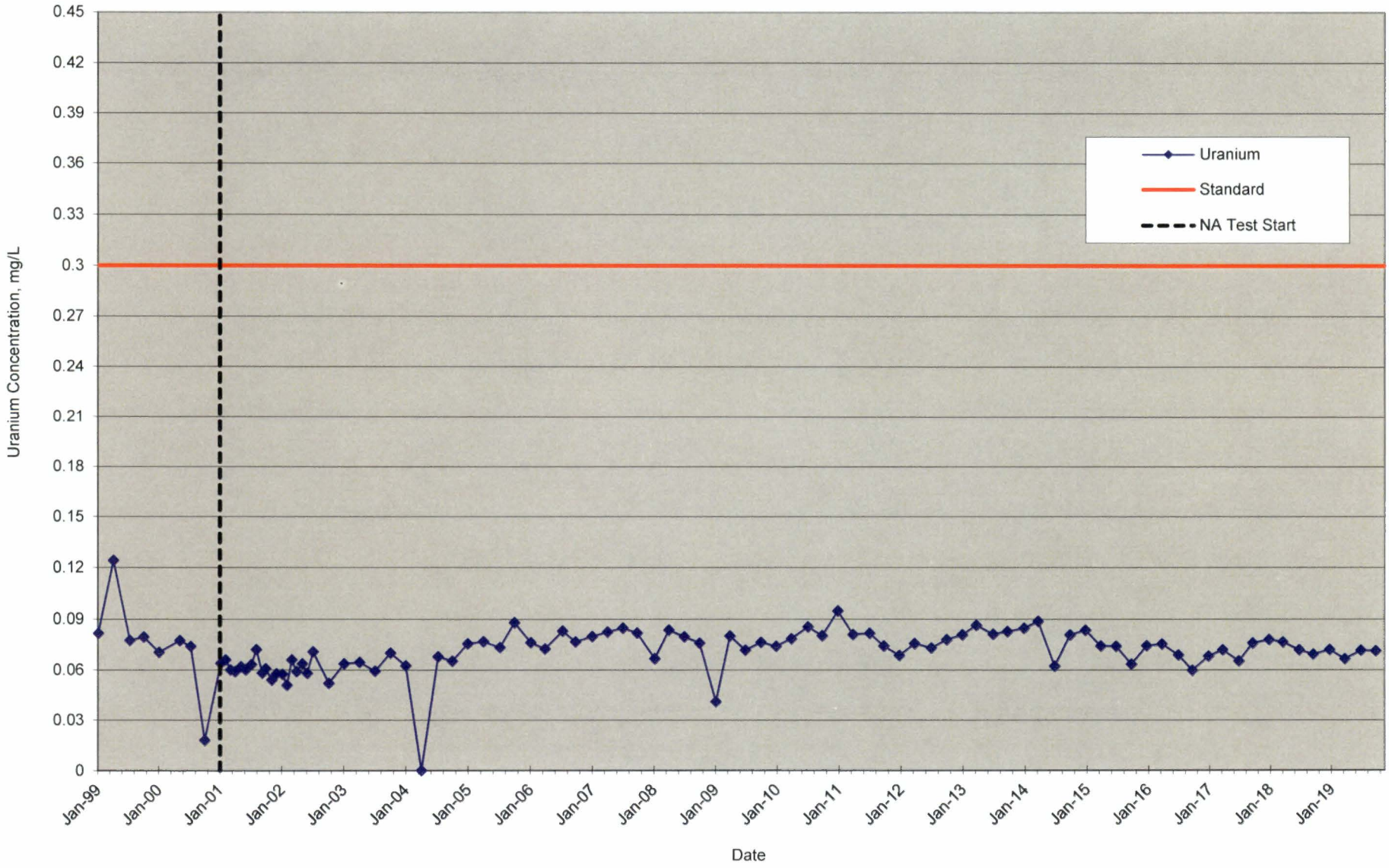


FIGURE 28

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

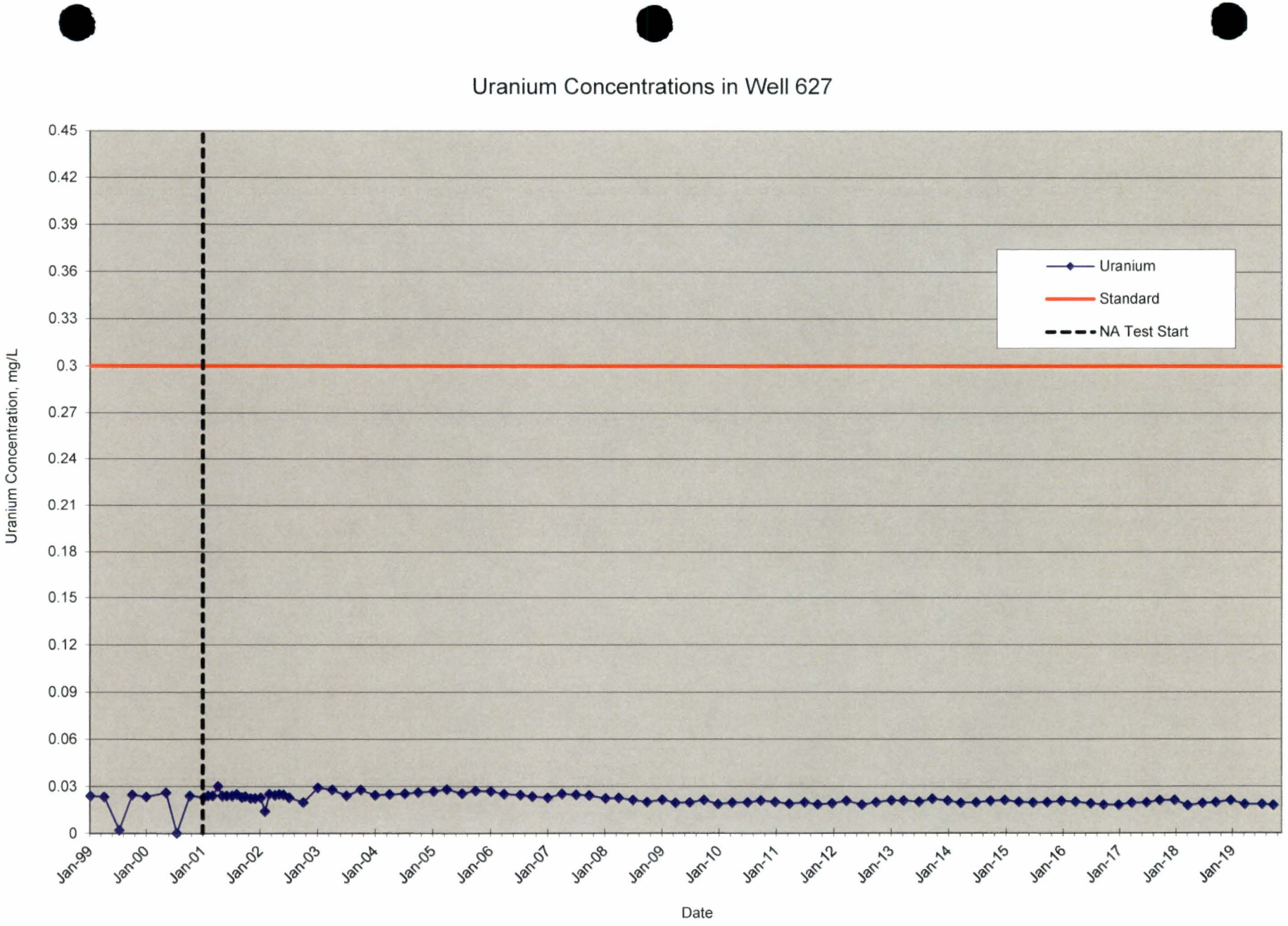


FIGURE 29

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

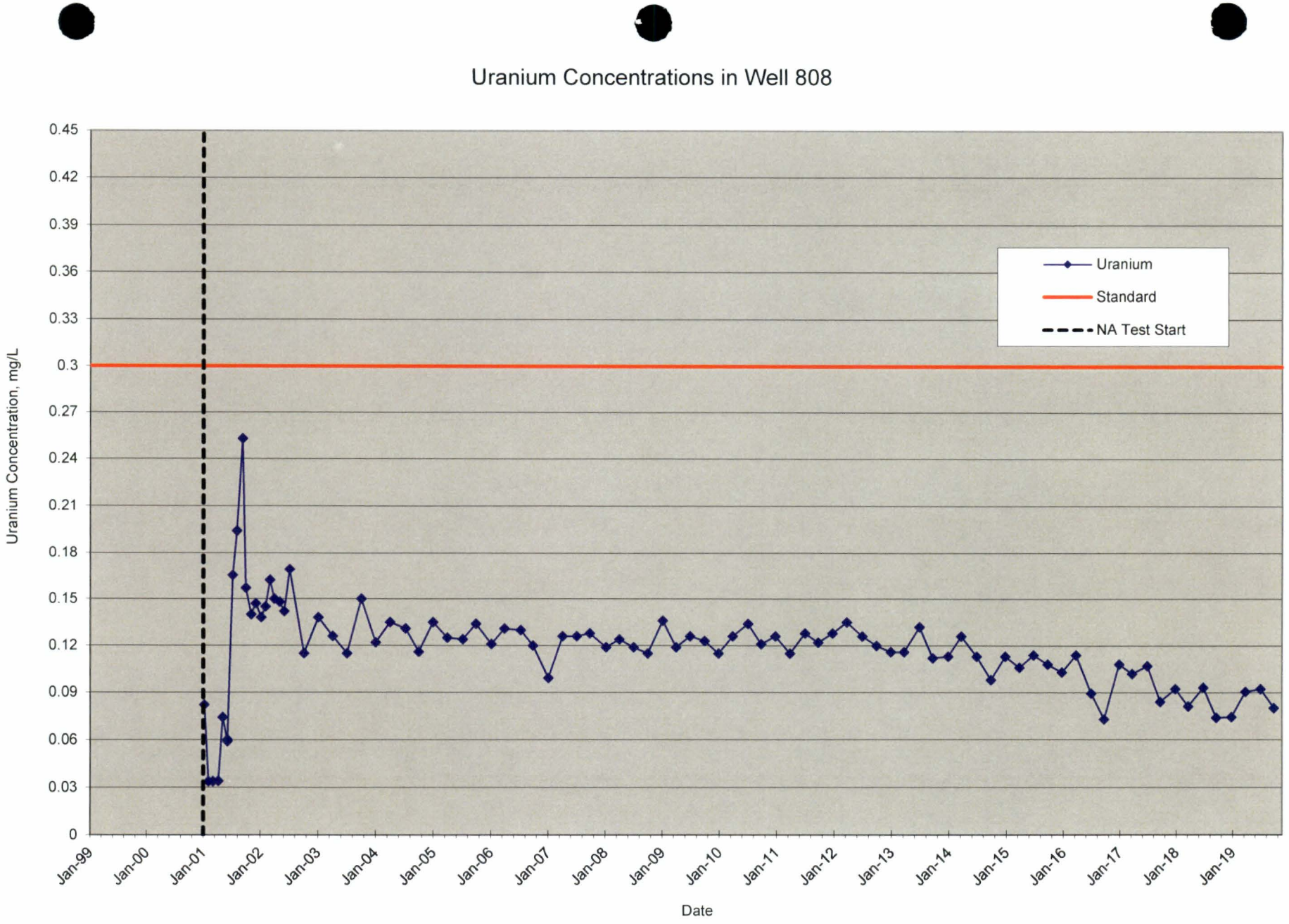


FIGURE 30

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

Uranium Concentrations in Well EPA 23

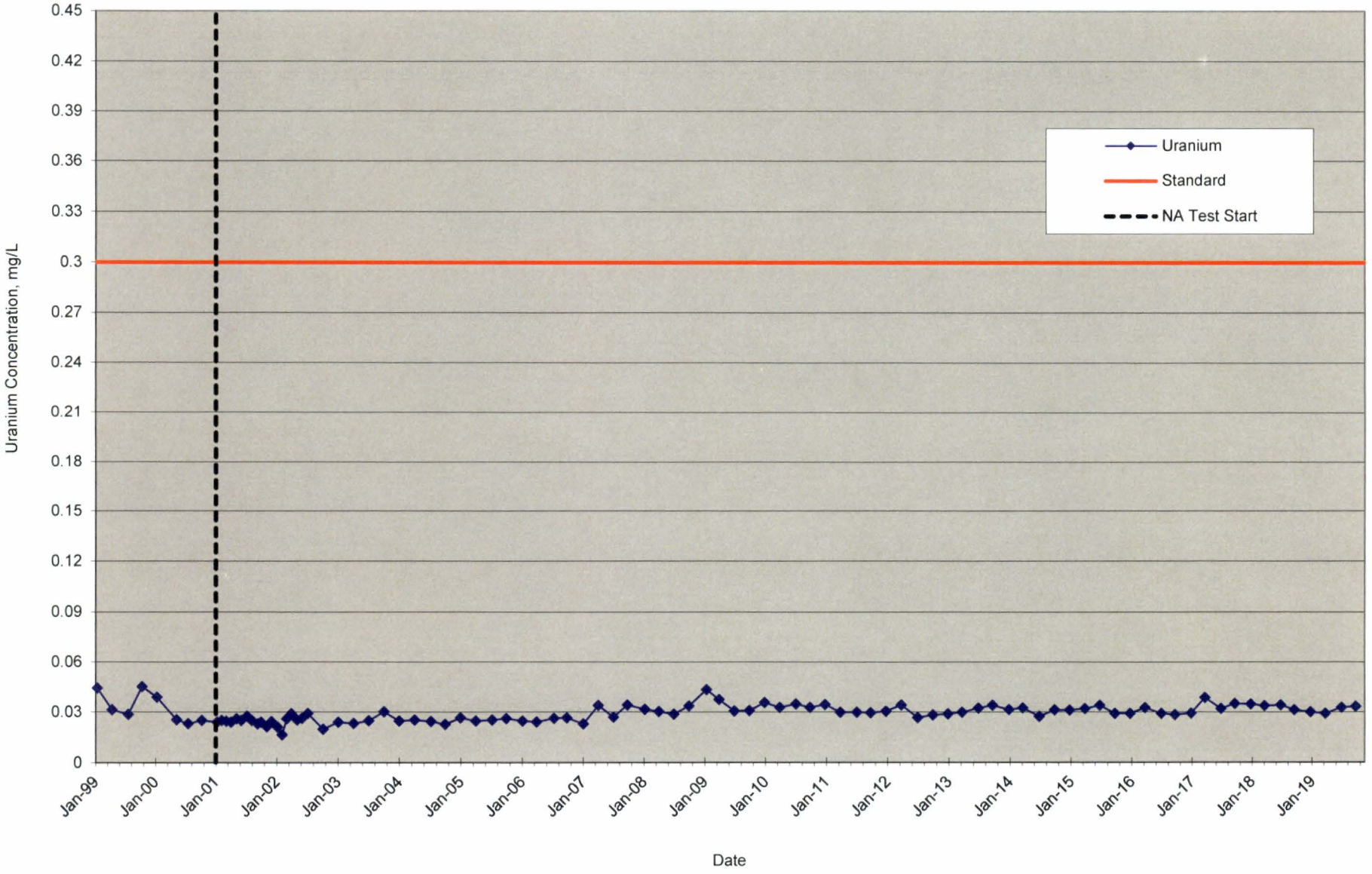


FIGURE 31

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

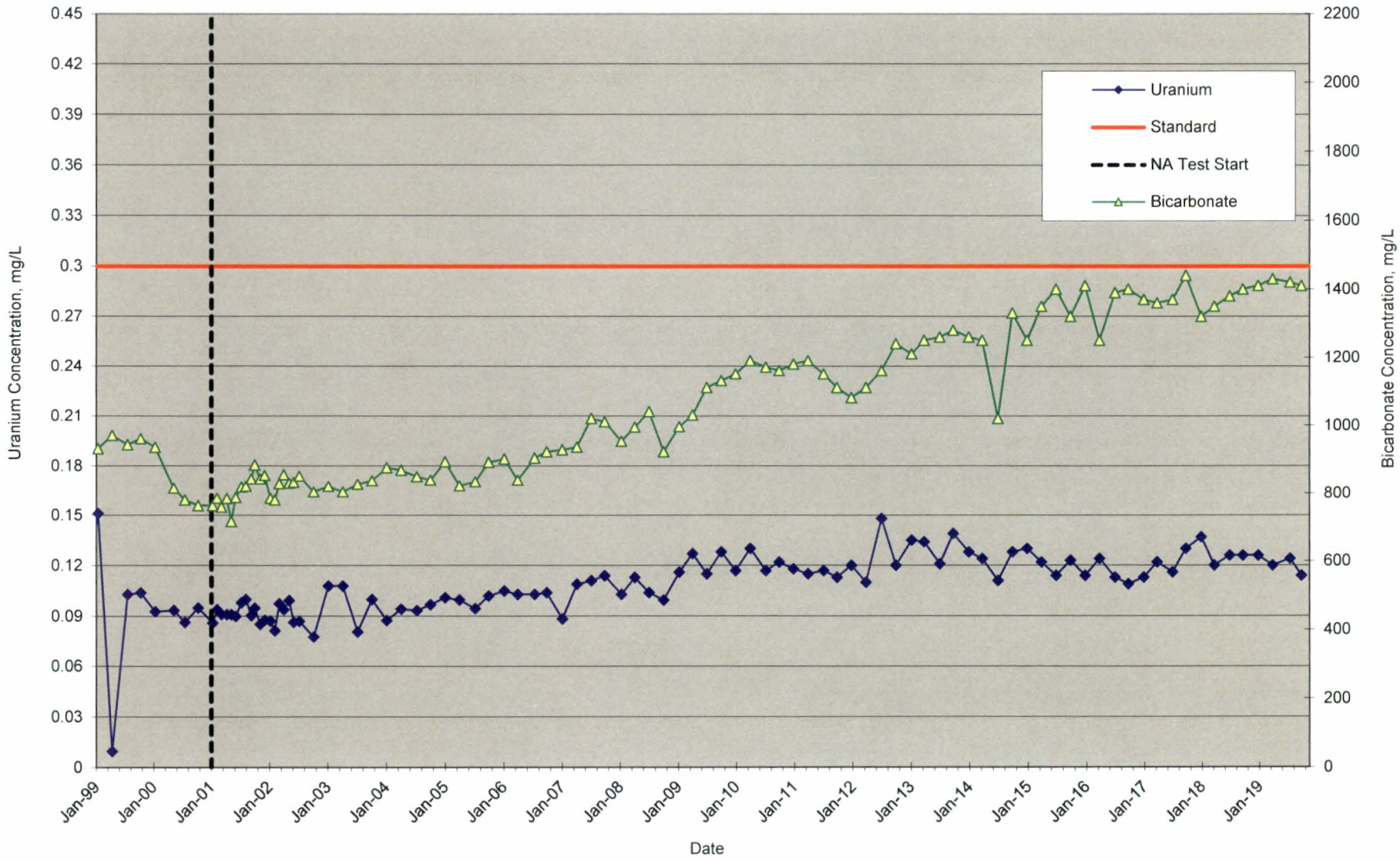


FIGURE 32

United Nuclear Corporation Church Rock Site,
Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

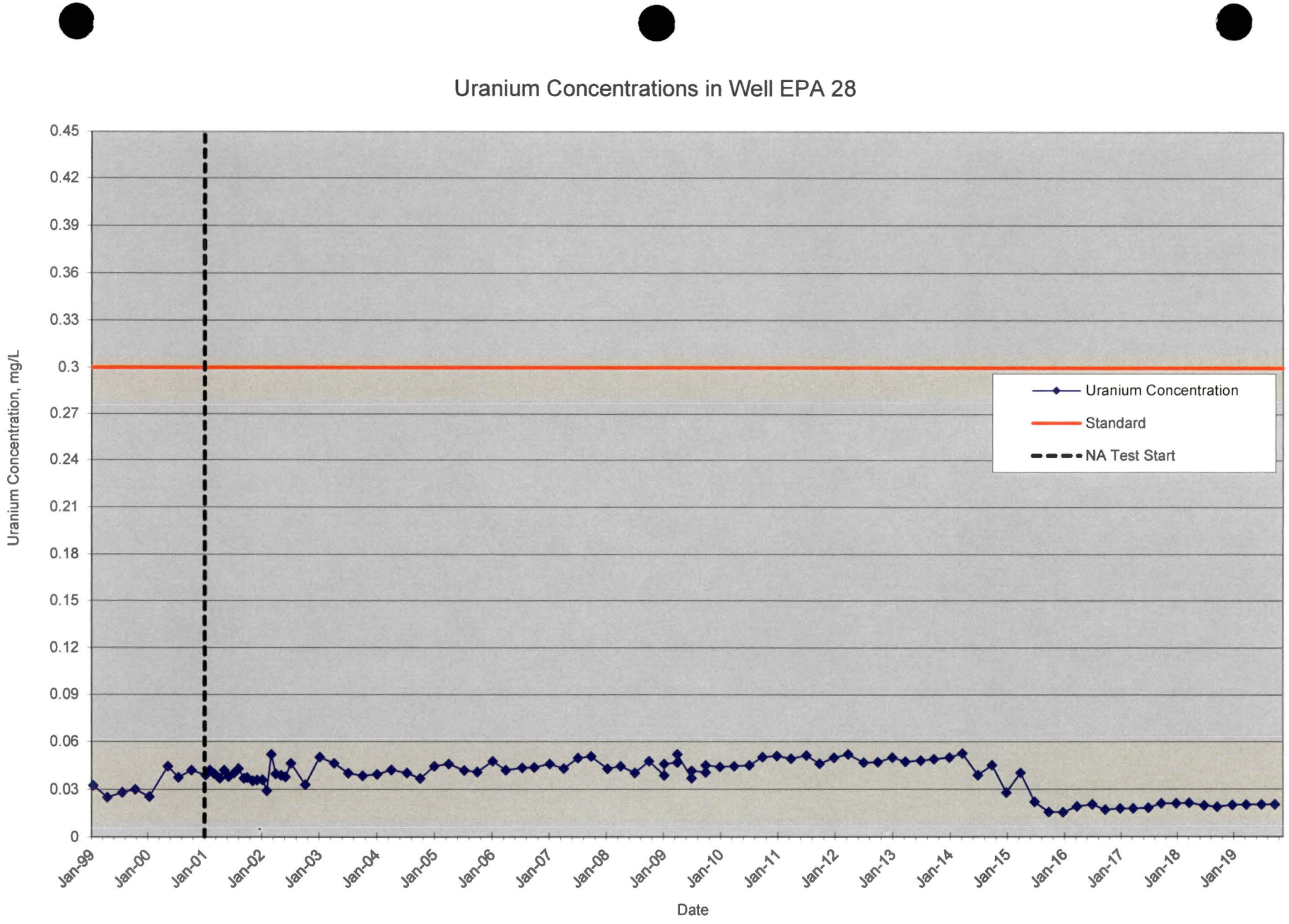


FIGURE 33

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

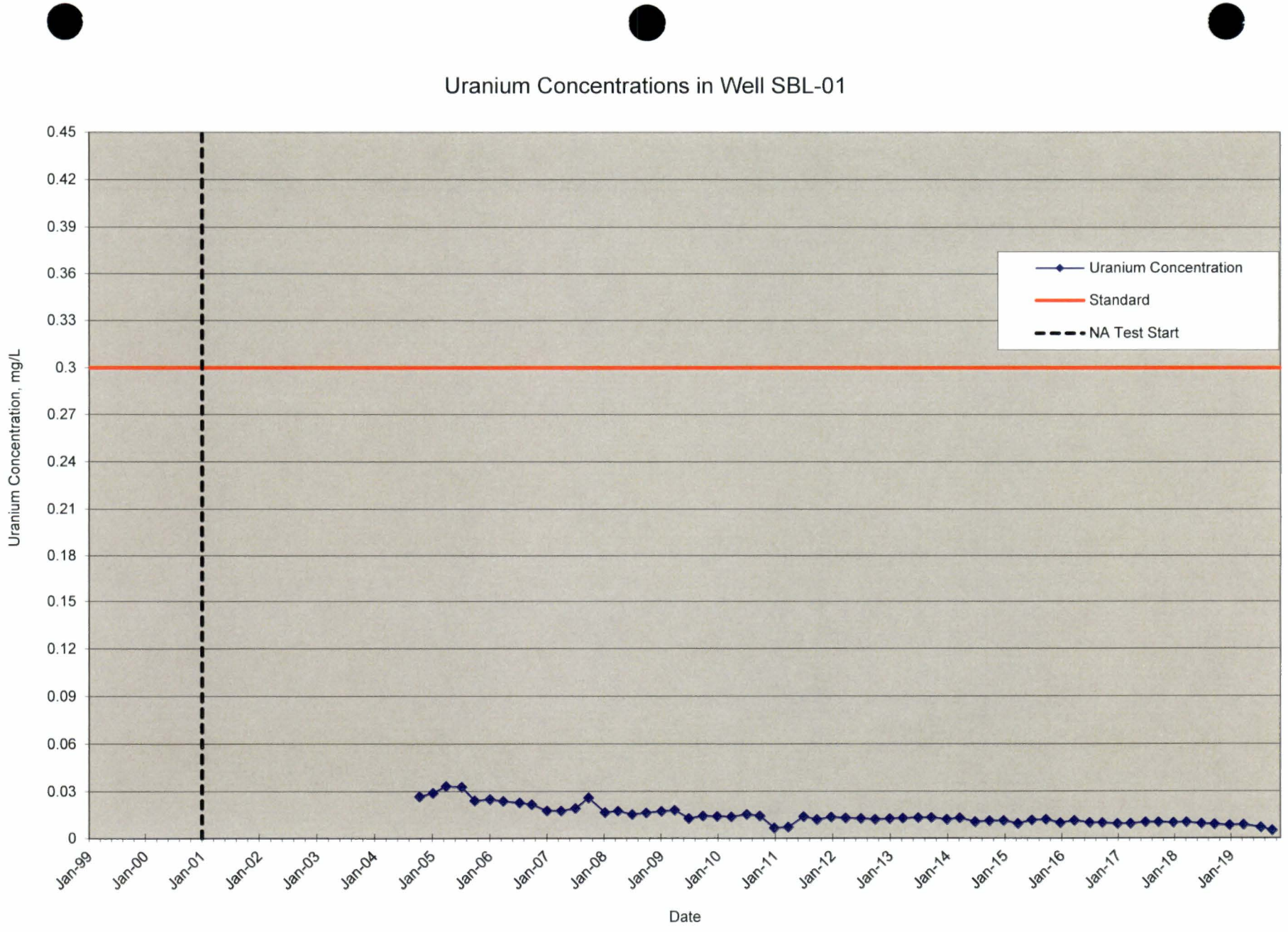
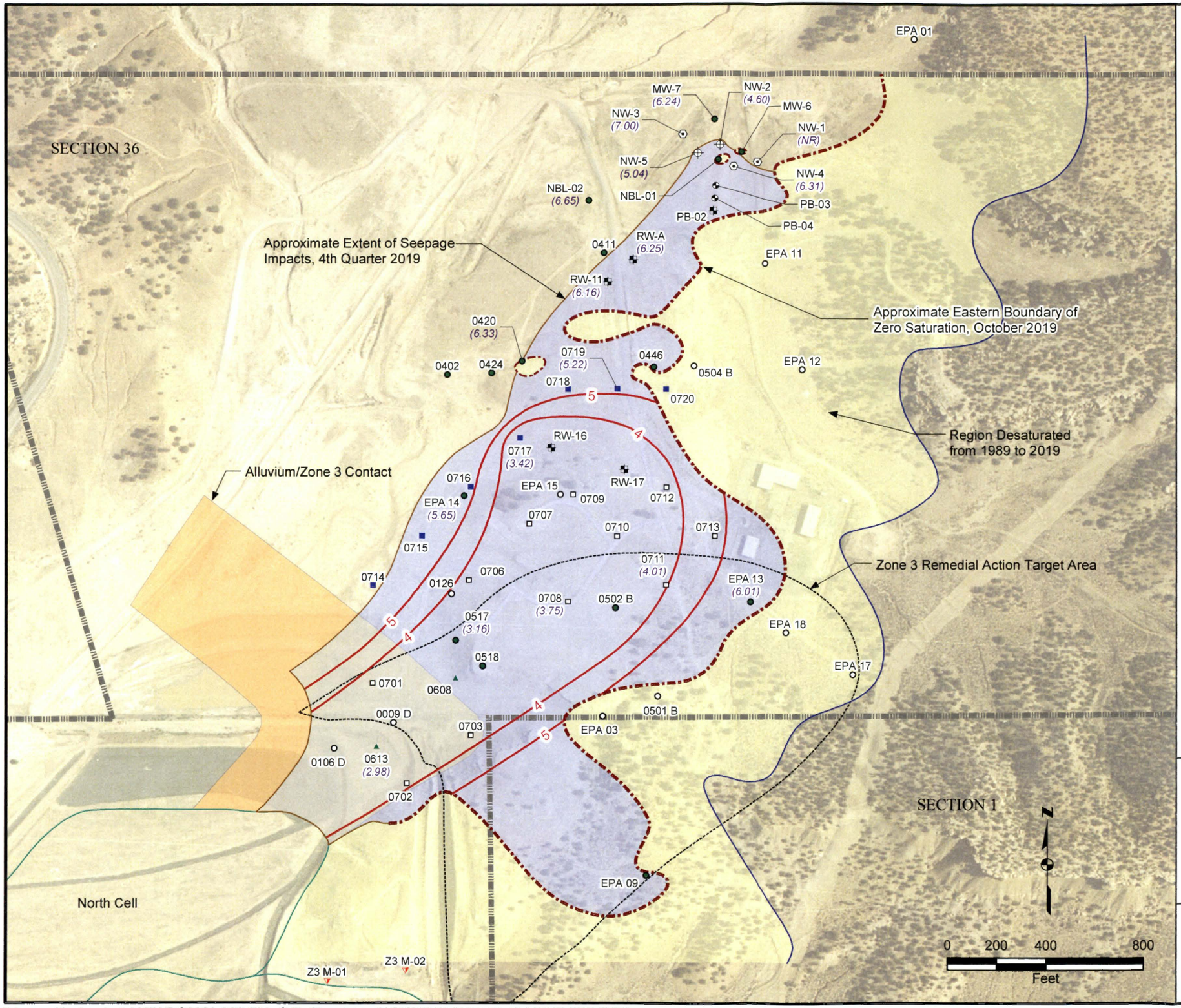


FIGURE 34

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES



LEGEND

Well Type

- Monitoring
- Northernmost Pumping Wells
- Northernmost Pumping Wells (Off)
- Dry Monitoring
- Stage I Extraction
- Stage II Extraction
- Other Extraction Wells
- Plume Boundary
- Northeast Pump-Back
- Piezometer

NR Not Recorded

NM Not Measured

- Approximate Eastern Boundary of Zero Saturation
- Approximate Area of Zero Saturation
- pH contour
- Cell Boundary
- Property Boundary
- Zone 3 Target Remedial Action Area
- Section Boundary
- Approximate Area Impacted by Tailings Seepage

NOTES

1. Well names are displayed with black text.
2. Values for field measured pH are shown with purple text and enclosed in parentheses.
3. pH 3 contours omitted for figure clarity.
4. PB-02 not pumping during 2019.
5. Aerial photo taken on August 1, 1996.
6. Field measured pH values for PB-04 and NBL-01 were historically below 3.0 pH units. See Appendix B.

FIGURE 35

Zone 3 Approximate Extent of Seepage Impacts, October 2019

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

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LEGEND

- Monitoring Well
- Non-Pumping Well
- Pumping Well
- Cell Boundary
- Property Boundary
- Approximate Eastern Boundary of Zero Saturation
- Approximate Area of Zero Saturation
- Groundwater Elevation Contour
- Inferred Groundwater Elevation Contour
- Closed Groundwater Depression
- (6800.00) Measured Groundwater Elevation (FT AMSL)

NOTES

1. Groundwater elevation values are displayed in feet above mean sea level.
2. Well names are displayed with black text.
3. Aerial photo taken on August 1, 1996.
4. The measured Well 0420 groundwater elevation is below the base of Zone 3.

FIGURE 36

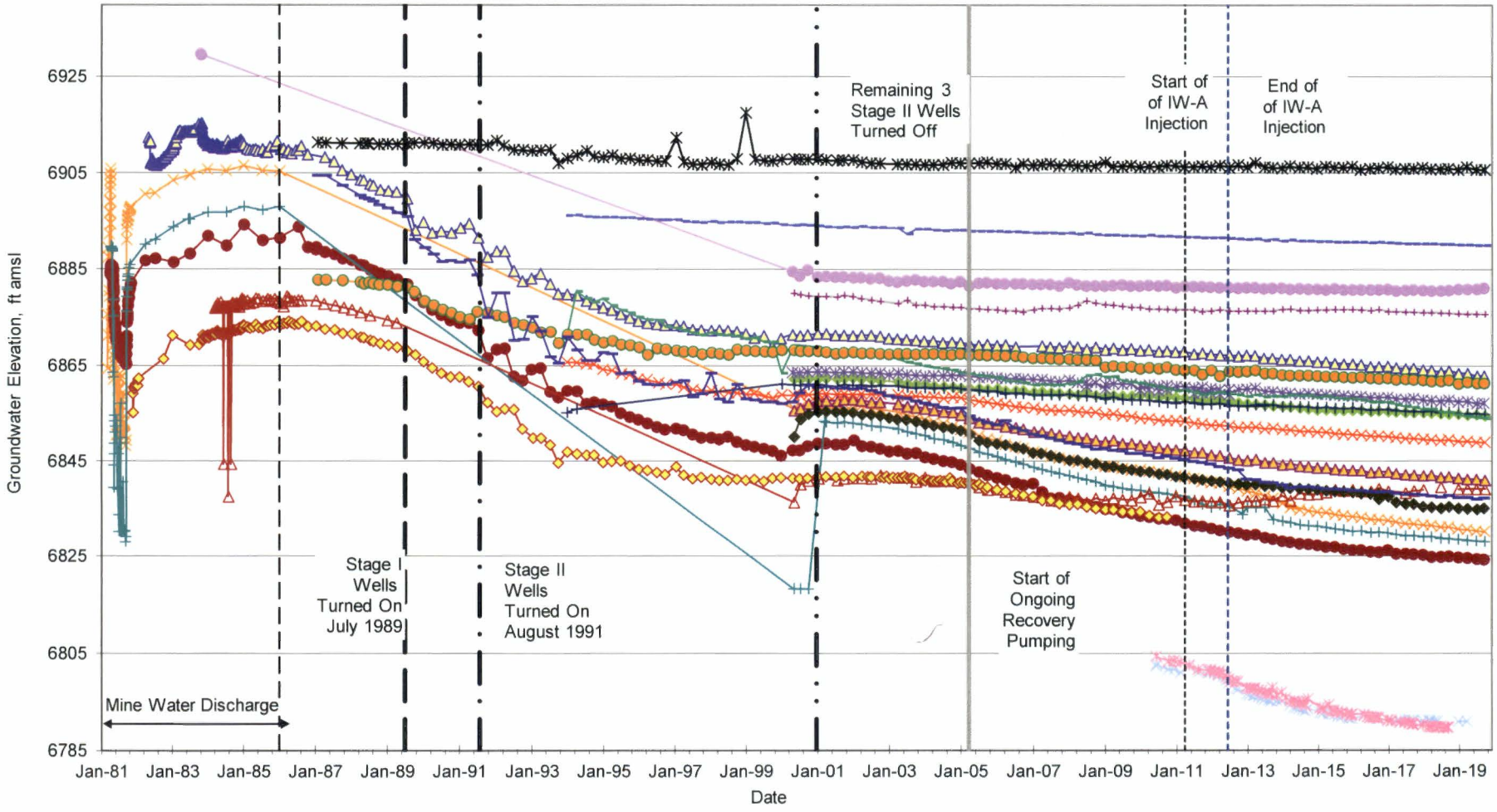
Zone 3 Potentiometric Surface Map, October 2019

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

Effects of Past and Current Pumping to Dewater Zone 3



*EPA 14 measuring point elevation adjustment applied as of Jan-13

FIGURE 37

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

LEGEND

- Monitoring Well
- Non-Pumping Well
- Pumping Well
- Saturated Thickness Contour
- Approximate Eastern Boundary of Zero Saturation
- Approximate Area of Zero Saturation
- Cell Boundary
- Property Boundary
- (5.5) Measured Saturated Thickness

NOTES

1. Saturated thickness values shown in feet.
2. Well names are displayed with black text.
3. Aerial photo taken on August 1, 1996.
4. The measured well 0420 groundwater elevation is below the base of Zone 3.

FIGURE 38

Zone 3 Saturated Thickness Map, October 2019

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

Zone 3 Bicarbonate Concentrations Over Time

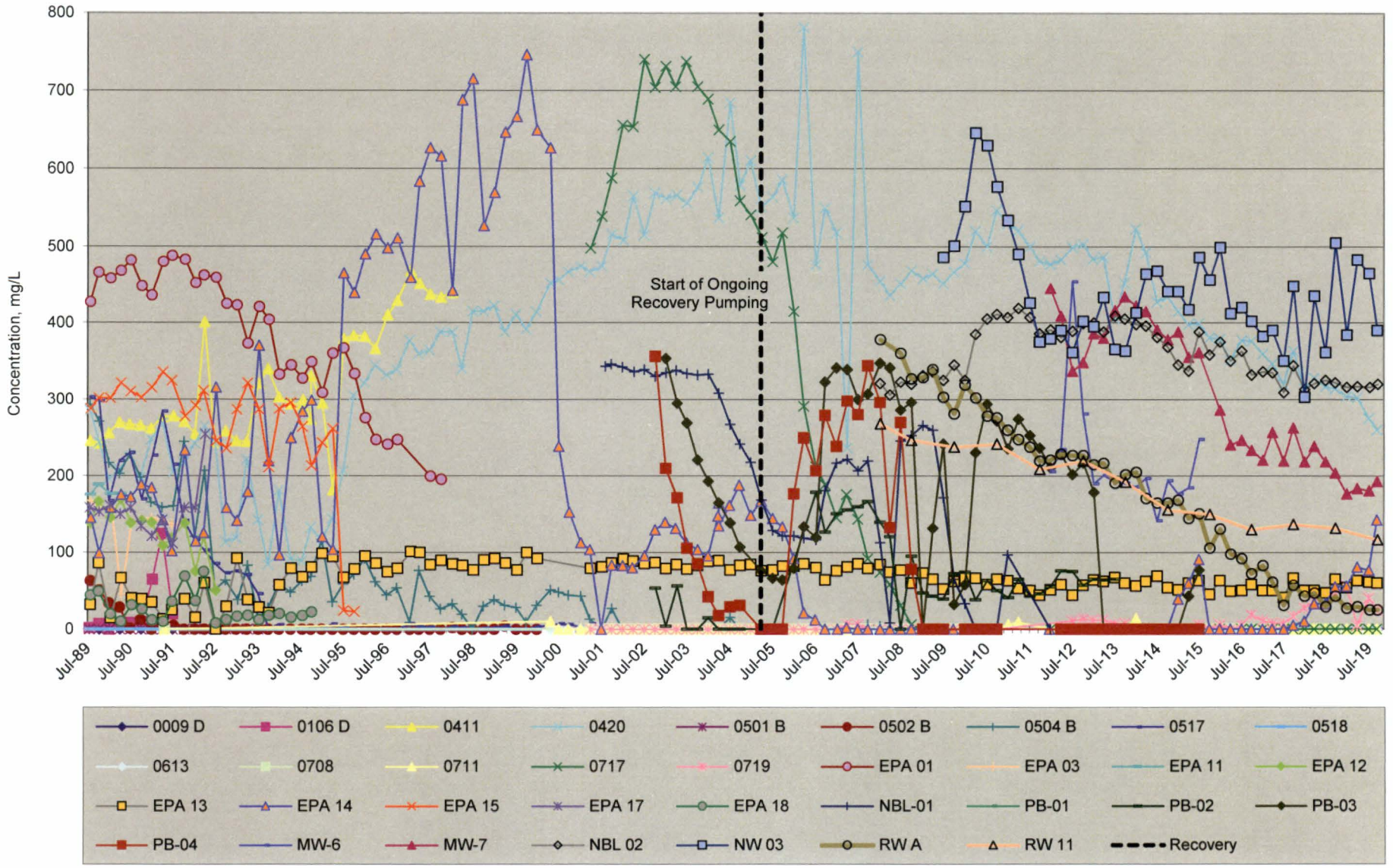


FIGURE 39

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

Zone 3 Impact Perimeter Bicarbonate Concentrations Over Time

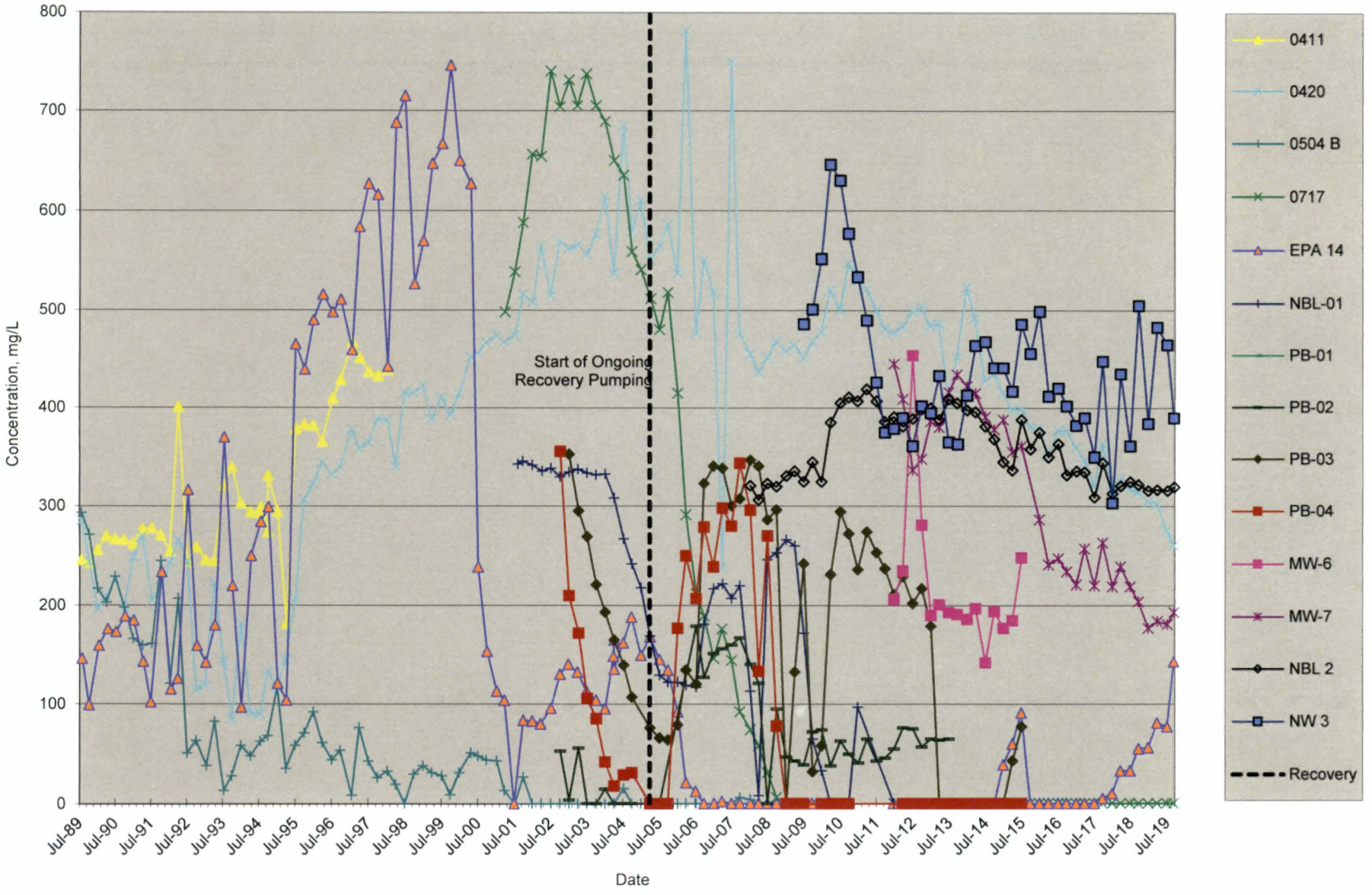


FIGURE 40

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

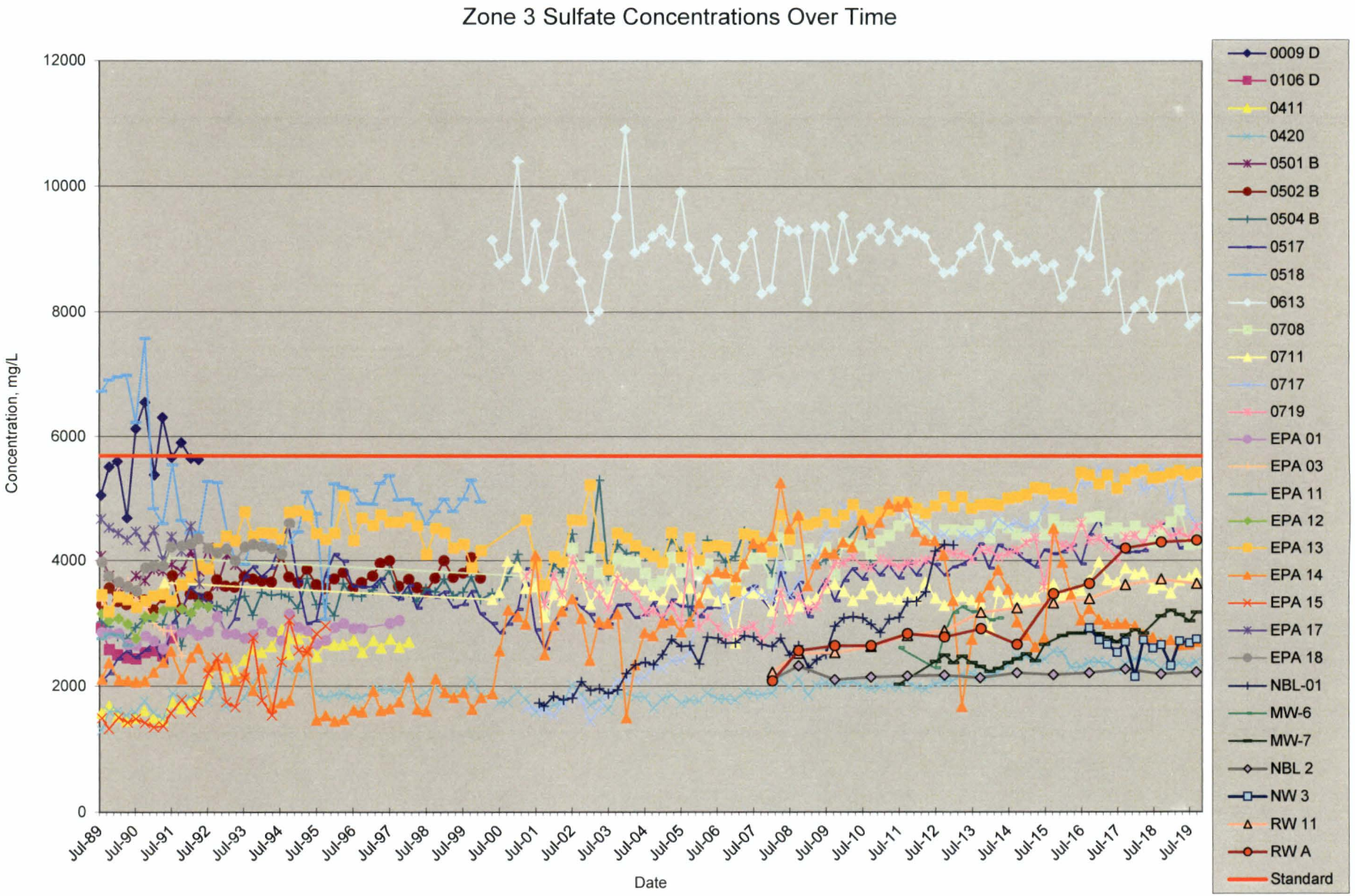
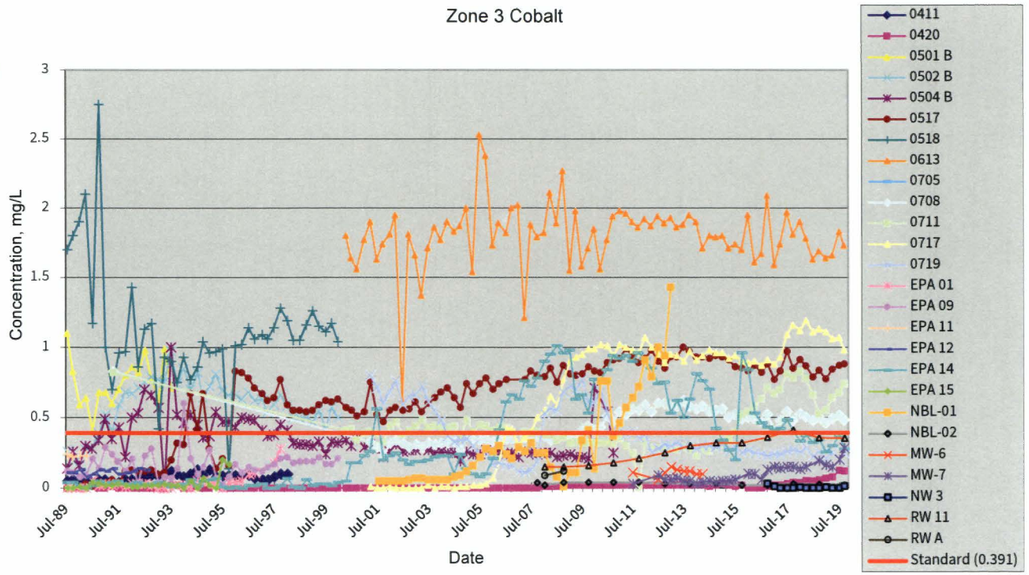


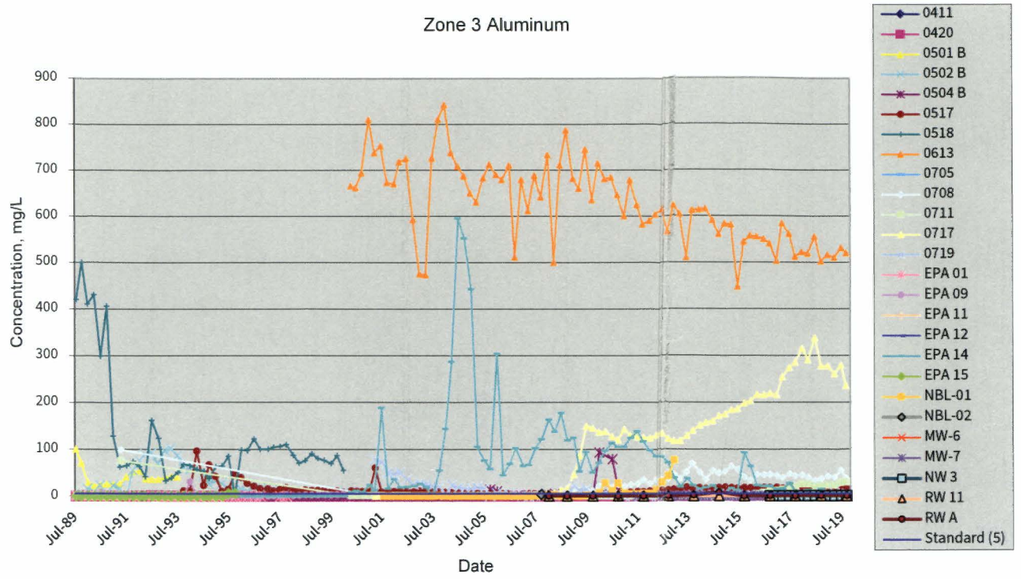
FIGURE 41

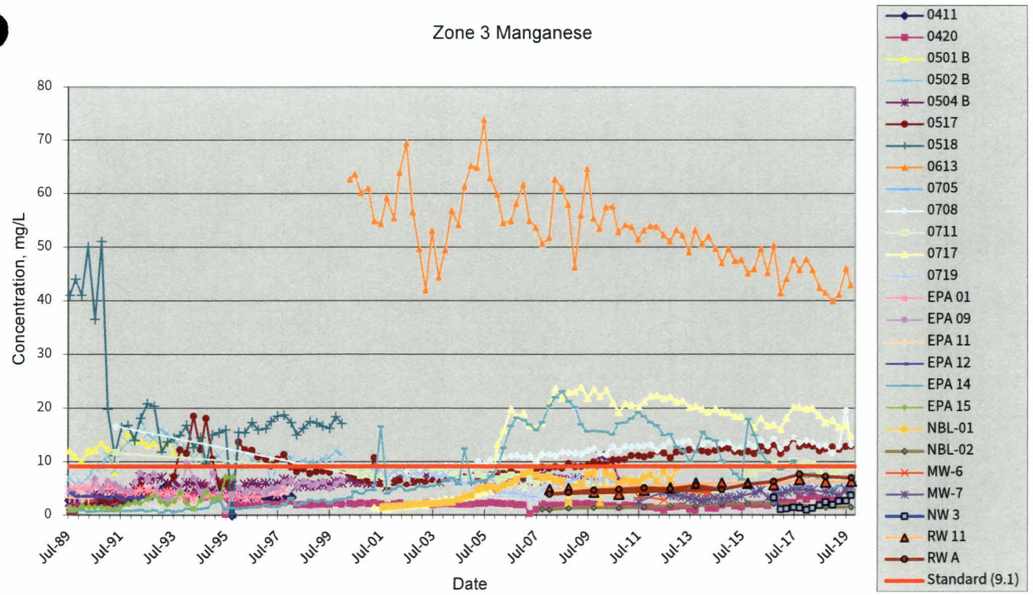
United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

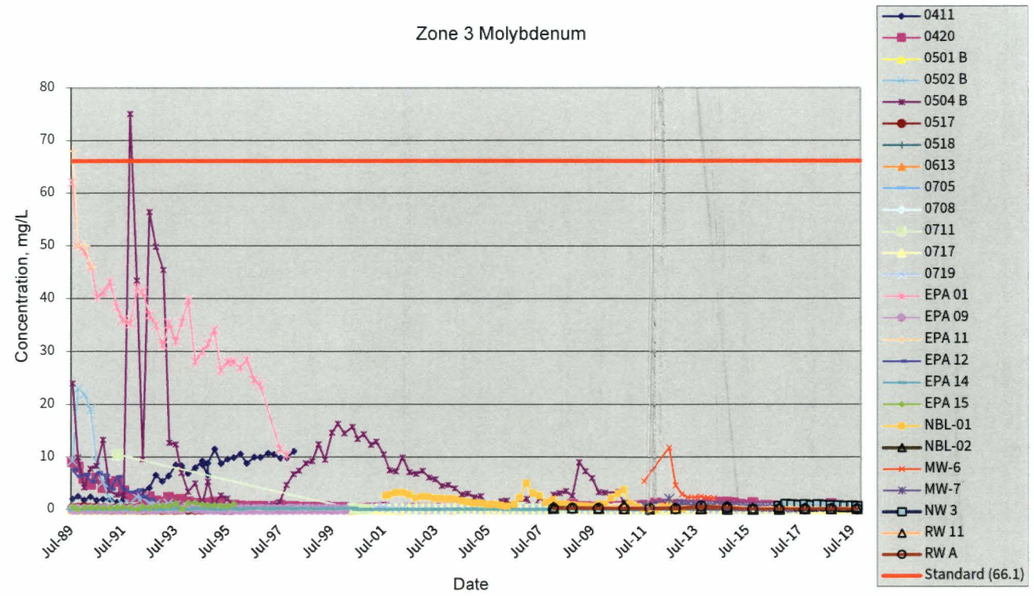
wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES









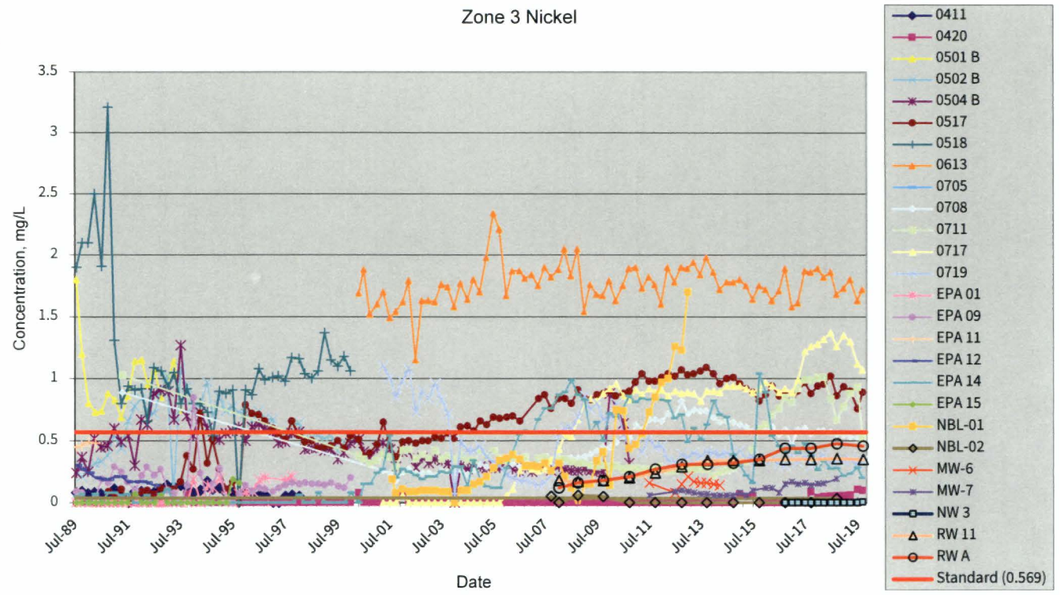
Zone 3 Metals Concentrations Over Time

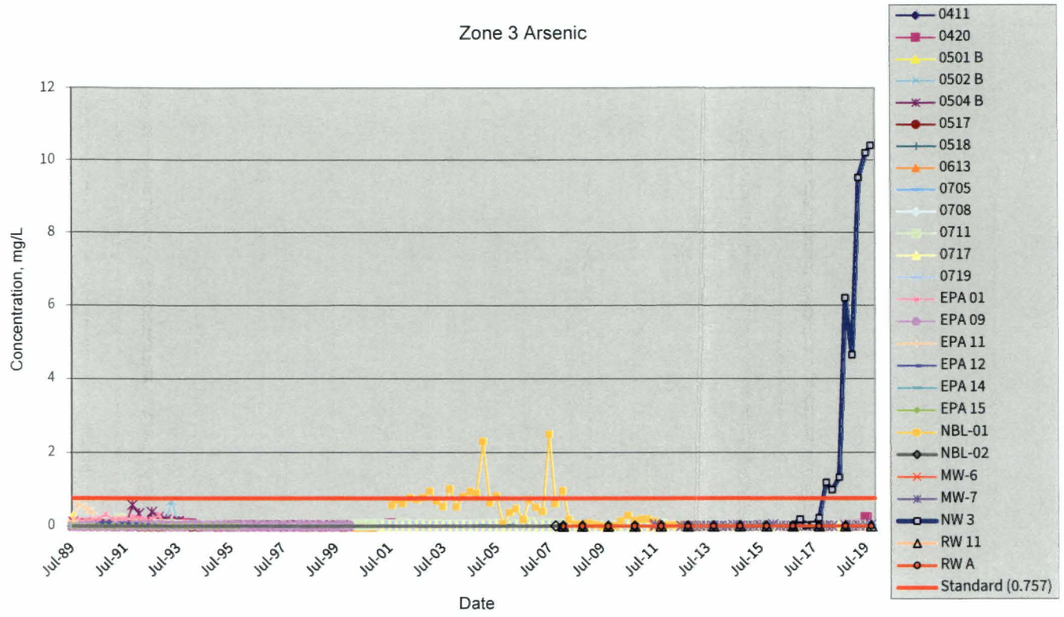
FIGURE 42A

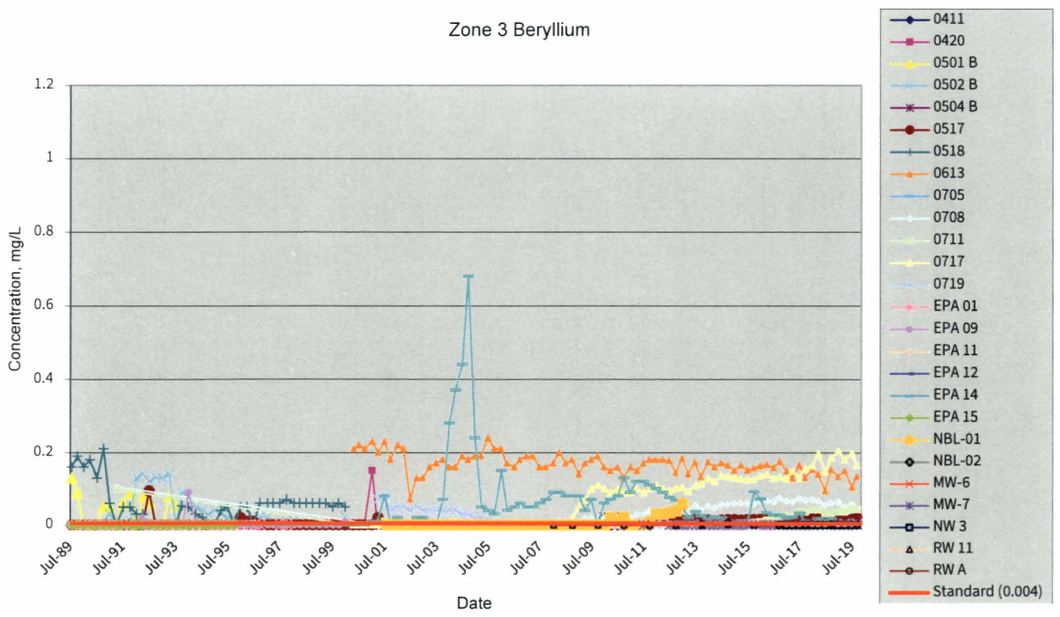
United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

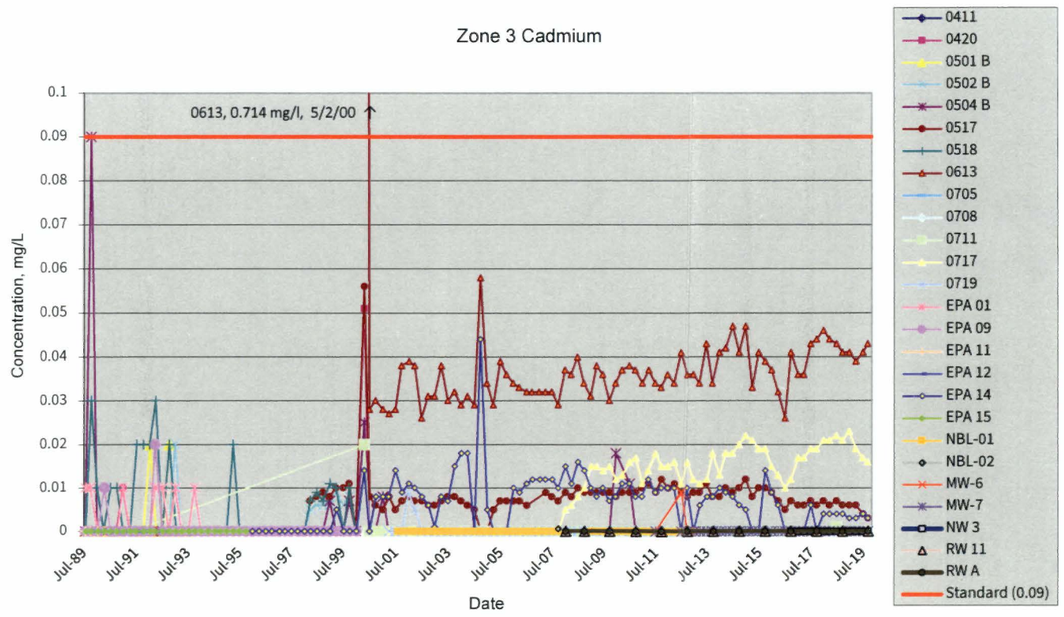
wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES









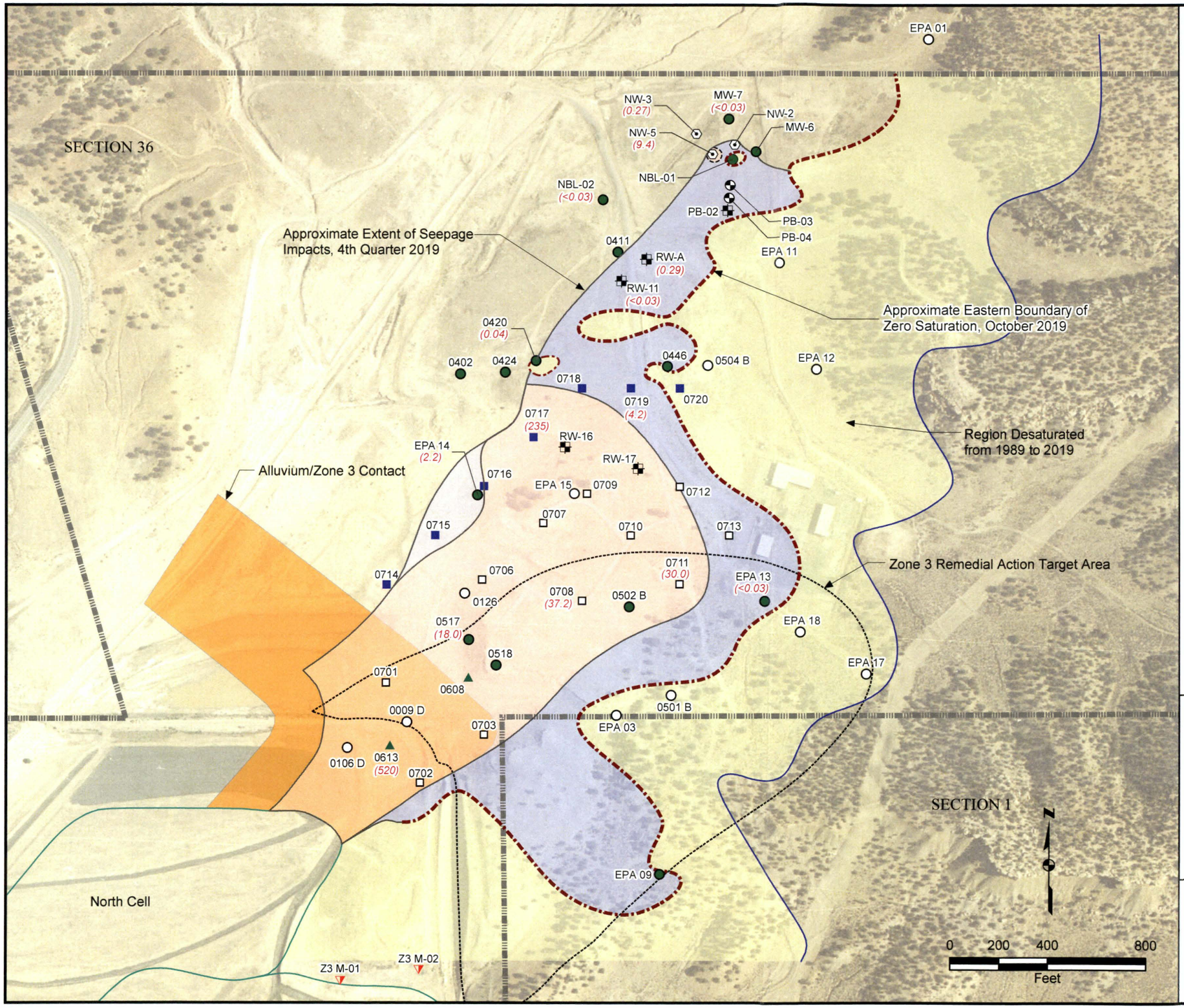
Zone 3 Metals Concentrations Over Time

FIGURE 42B

United Nuclear Corporation Church Rock Site,
Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES



LEGEND

- Property Boundary
- Approximate Eastern Boundary of Zero Saturation
- Approximate Area of Zero Saturation
- Zone 3 Target Remedial Action Area
- Section Boundary
- Cell Boundary

Well Type

- Monitoring
- Northernmost Pumping Wells (Off)
- Dry Monitoring
- Stage I Extraction
- Stage II Extraction
- Other Extraction Wells
- Plume Boundary
- Northeast Pump-Back
- Piezometer

- Approximate Extent of Aluminum Exceeding 5.0 mg/L
- Approximate Area Impacted By Tailings Seepage
- *(20.8)* Aluminum values in mg/L

NOTES

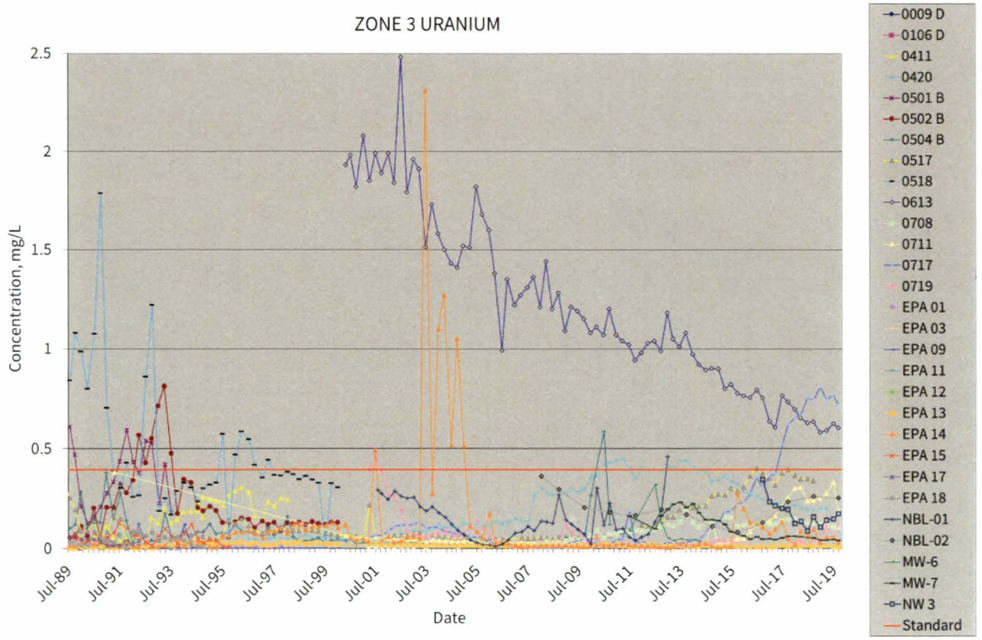
1. Well names are displayed with black text.
2. PB-02 not pumping during 2019.
3. Aerial photo taken on August 1, 1996.
4. Aluminum concentrations exceeding 5.0 mg/L were also historically measured in Northern Zone.v
5. Well NW-5 was sampled for all analytes for the first time in October, 2019.

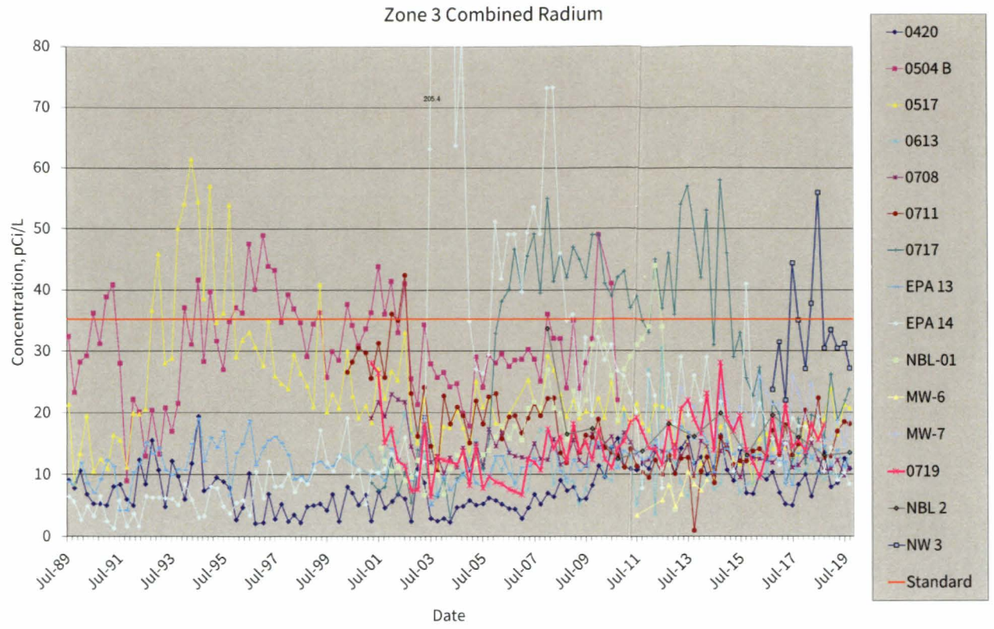
FIGURE 43

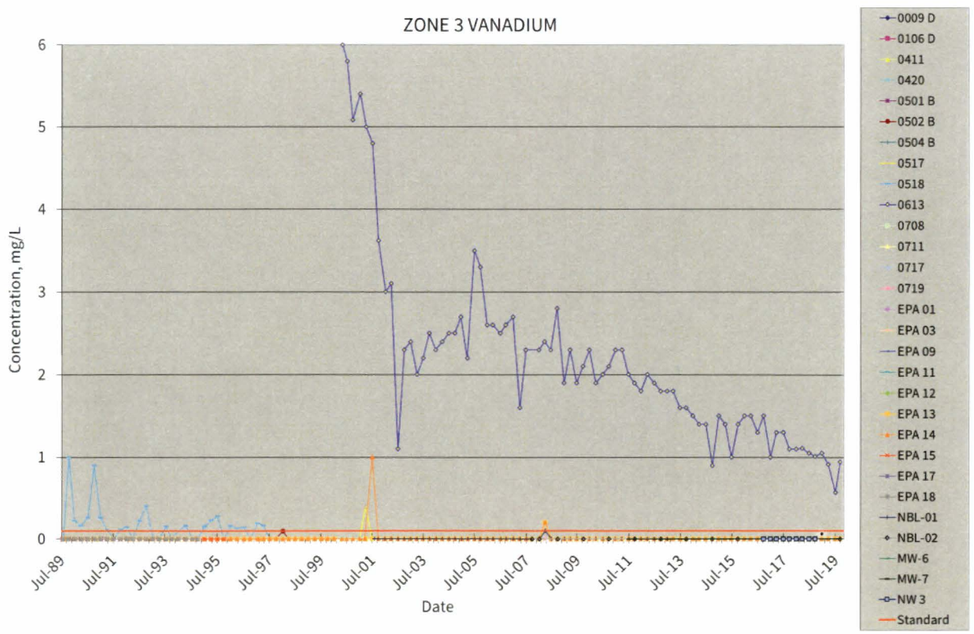
Zone 3 Approximate Extent of Aluminum Exceeding 5.0 mg/L, October 2019

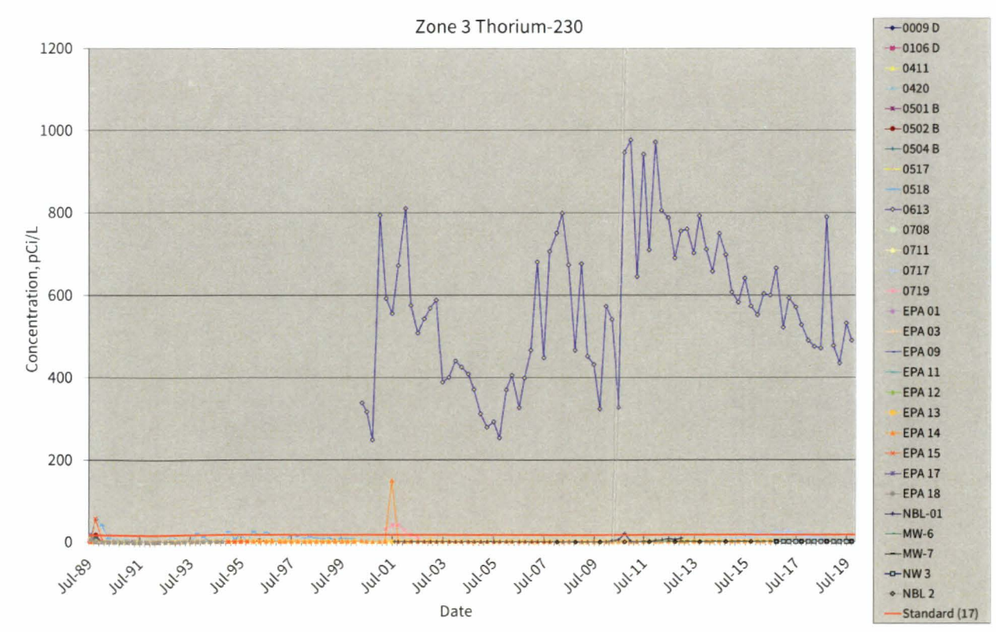
United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.









Zone 3 Uranium and Vanadium Concentrations and Radionuclides Activities Over Time

FIGURE 44A

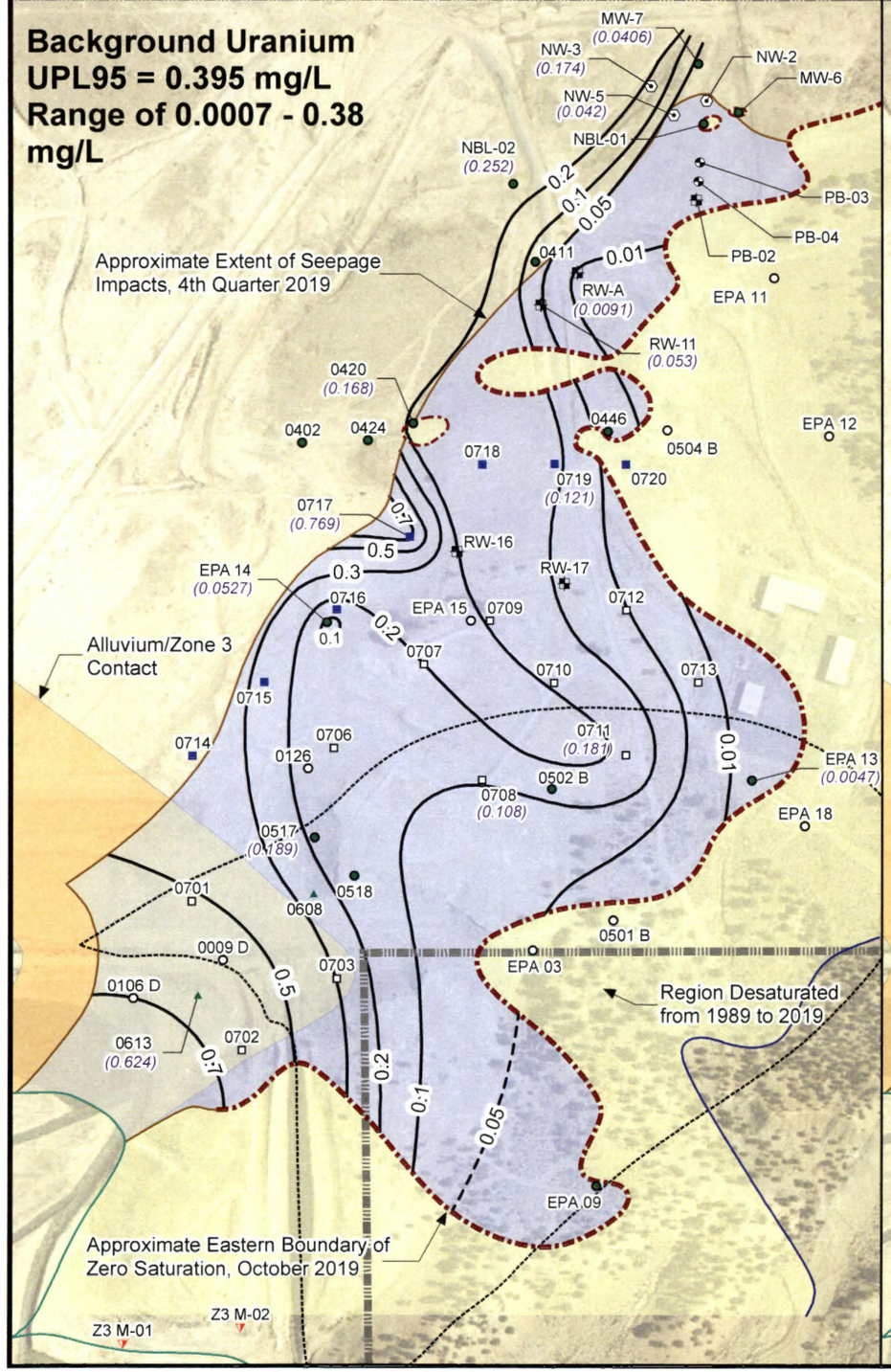
United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

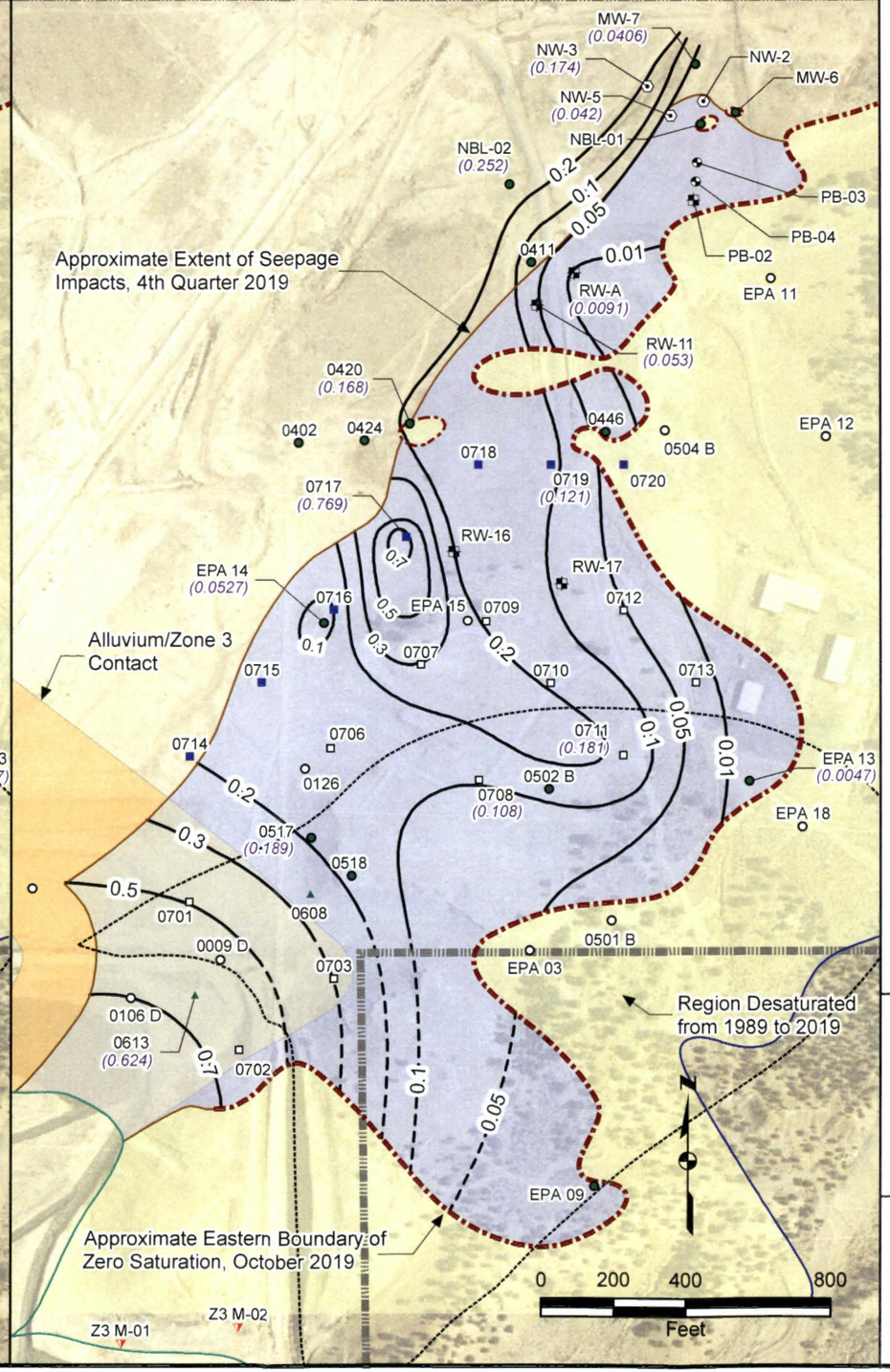
P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

October 2019 (Alternative 1)

Background Uranium
UPL95 = 0.395 mg/L
Range of 0.0007 - 0.38 mg/L



October 2019 (Alternative 2)



LEGEND

- Monitoring
- Northernmost Pumping Wells
- Northernmost Pumping Wells (Off)
- Dry Monitoring
- Stage I Extraction
- Stage II Extraction
- Other Extraction Wells
- Plume Boundary
- Northeast Pump-Back
- Piezometer
- Approximate Eastern Boundary of Zero Saturation
- Approximate Area of Zero Saturation
- Uranium Isoconcentration Contour in mg/L (Dashed where inferred)
- Cell Boundary
- Property Boundary
- Zone 3 Target Remedial Action Area
- Section Boundary
- Approximate Area Impacted by Tailings Seepage

NOTES

1. Well names are displayed with black text.
2. Uranium values are shown in purple text and enclosed in parentheses.
3. PB-02 not pumping during 2019.
4. Aerial photo taken on August 1, 1996.
5. Note that historical uranium concentrations at PB-03 and PB-04 were higher than inferred by current contours. See figure 44B (Hatch Chester, 2018)

FIGURE 44B

Zone 3 Uranium Isoconcentration Maps, 2019 (in mg/L)

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

October 2002

Background Uranium
UPL95 = 0.395 mg/L
Range of 0.0007 - 0.38 mg/L

SECTION 36

Approximate Extent of Seepage Impacts, 4th Quarter 2002

Approximate Eastern Boundary of Zero Saturation, October 2002

Alluvium/Zone 3 Contact

Region Desaturated from 1989 to 2002

SECTION 1

North Cell

EPA 01
MW-7
NW-3
MW-6
NBL-01 (0.251)
NBL-02
PB-03
PB-04
PB-02
0411
PB-01
EPA 11
0.1
0.05
0420 (0.0779)
0402
0424
0718
0719 (0.086)
0446
0504 B (0.0331)
0720
EPA 12
0717 (0.115)
0716
EPA 14 (0.0558)
EPA 15
0709
0712
0707
0715
0710
0713
0714
0706
0126
0502 B
0711 (0.0454)
EPA 13 (0.0173)
0708 (0.0118)
0517 (0.066)
EPA 18
EPA 17
0518
0608
0701
0501 B
EPA 03
0009 D
0703
0106 D
0613 (1.79)
0702
1.5
1
0.5
0.1
0.05
EPA 09
Z3 M-01
Z3 M-02
0
200
400
800
Feet

LEGEND

- Property Boundary
- Zone 3 Target Remedial Action Area
- Section Boundary
- Cell Boundary
- Approximate Area Impacted by Tailings Seepage
- Monitoring
- Northernmost Pumping Wells
- Northernmost Pumping Wells (Off)
- Dry Monitoring
- Stage I Extraction
- Stage II Extraction
- Other Extraction Wells
- Plume Boundary
- Northeast Pump-Back
- Piezometer
- Approximate Eastern Boundary of Zero Saturation
- Uranium Isoconcentration Contour in mg/L (dashed where inferred)

NOTES

1. Well names are displayed with black text.
2. Uranium values are shown in purple text and enclosed in parentheses.
3. Aerial photo taken on August 1, 1996.

FIGURE 44C

Zone 3 Uranium Isoconcentration Map, 2002 (in mg/L)

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

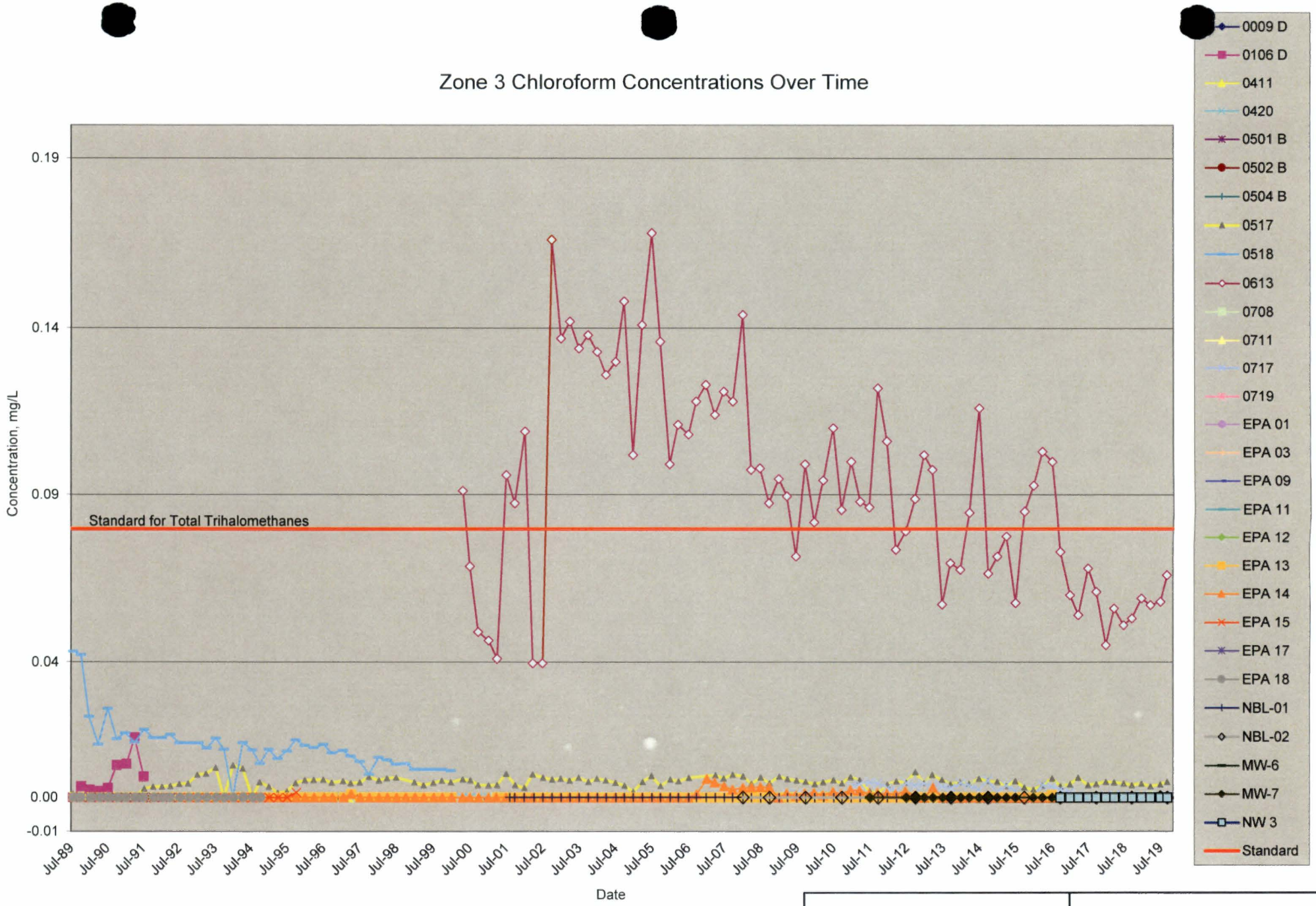
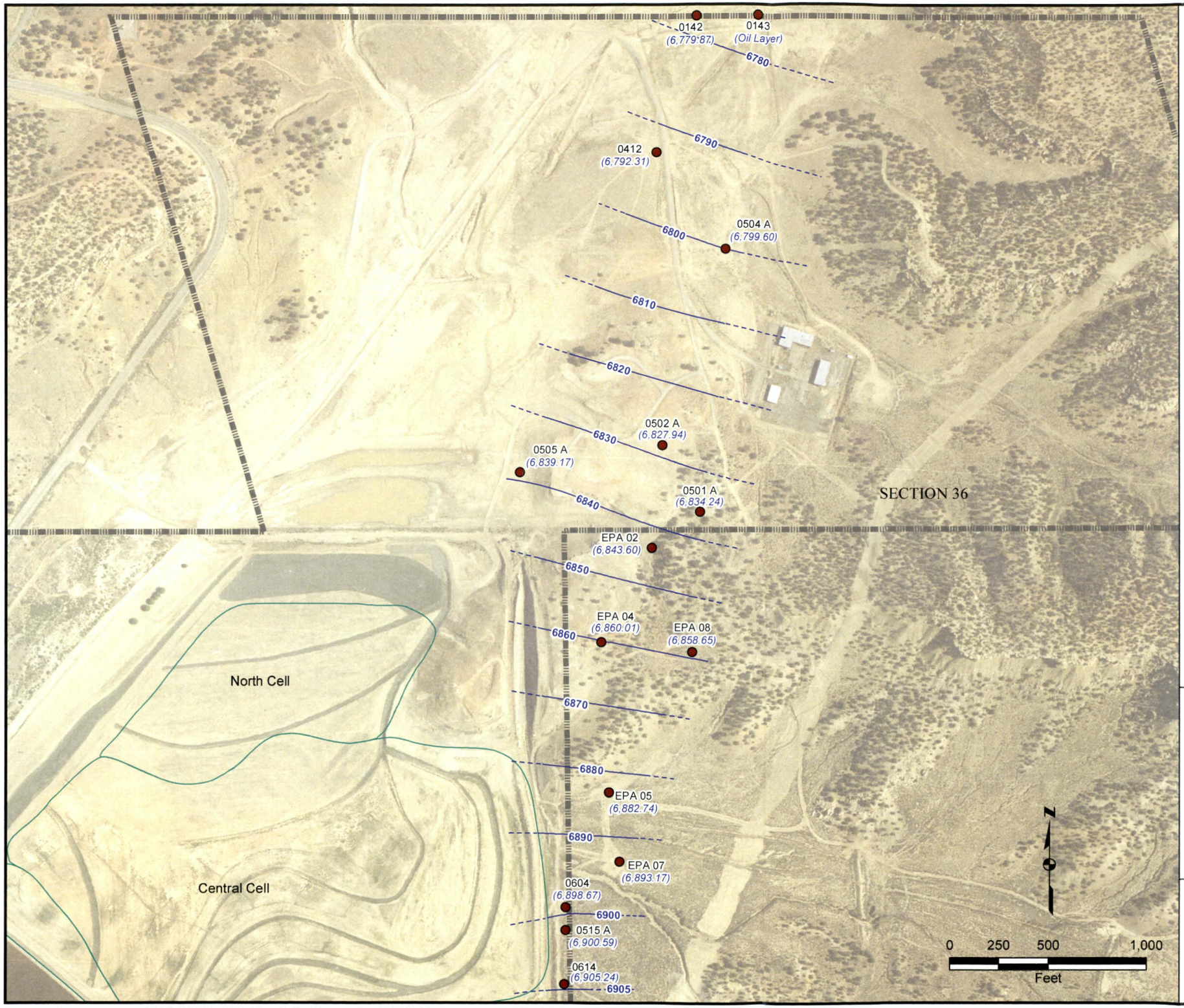


FIGURE 45

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES



LEGEND

- Zone 1 Monitoring Well
- Groundwater Elevation Contour
- Inferred Groundwater Elevation Contour
- Cell Boundary
- Property Boundary

Notes:

1. Groundwater elevation values are displayed in feet above mean sea level.
2. Well names are displayed with black text.
3. Groundwater elevations are shown with blue text and enclosed in parentheses.
4. Aerial photo taken on August 1, 1996.

FIGURE 46

Zone 1 Potentiometric Surface Map, October 2019

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

Zone 1 Water Levels Over Time

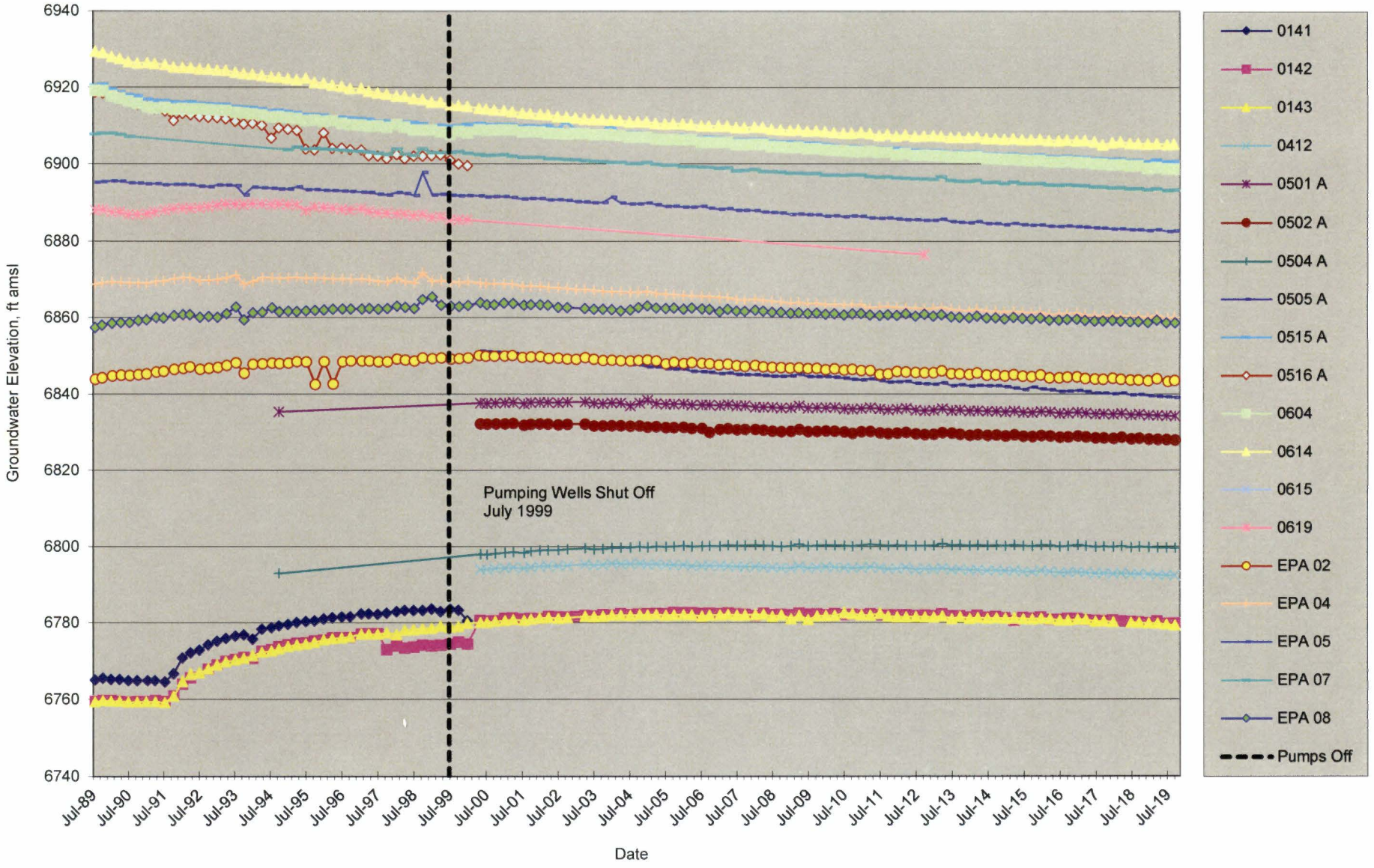
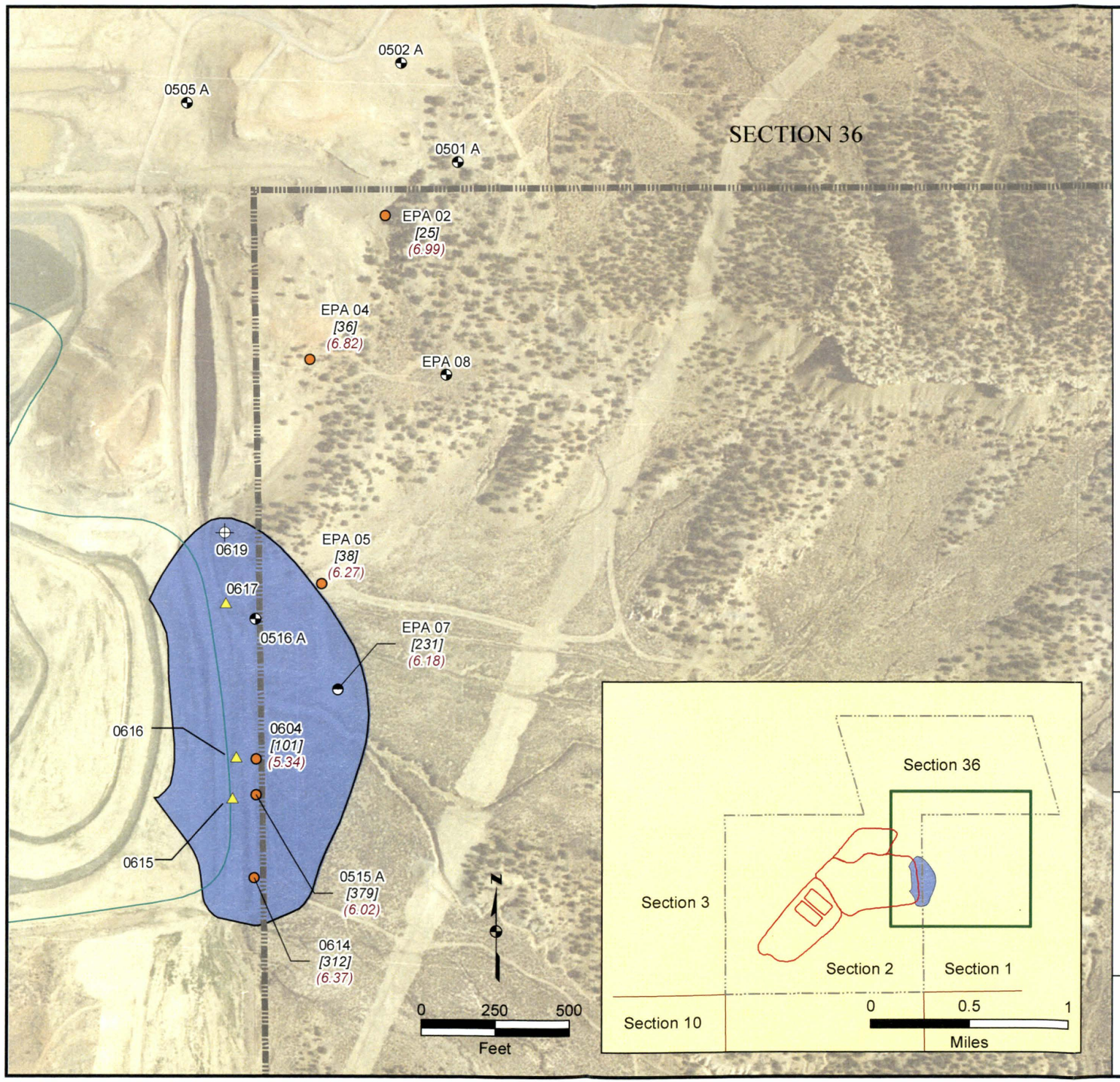


FIGURE 47

United Nuclear Corporation Church Rock Site,
Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES



LEGEND

Well Type

- Water Quality and Water Level Monitoring
- Former Water Quality and Water Level Monitoring
- Water Level Monitoring
- Decomissioned East Pump Back
- Revised East Pump Back (Inactive)
- Cell Boundary
- Property Boundary
- Approximate Extent of Zone 1 Seepage Impact
- *[38]* Chloride result in mg/L
- *(6.23)* Field-measured pH in SU

Notes:

1. Seepage impacts delineated by chloride detections greater than 50 mg/L.
2. Aerial photo taken on August 1, 1996.

FIGURE 48

Zone 1 Extent of Seepage Impacts, October 2019

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

Zone 1 pH Over Time

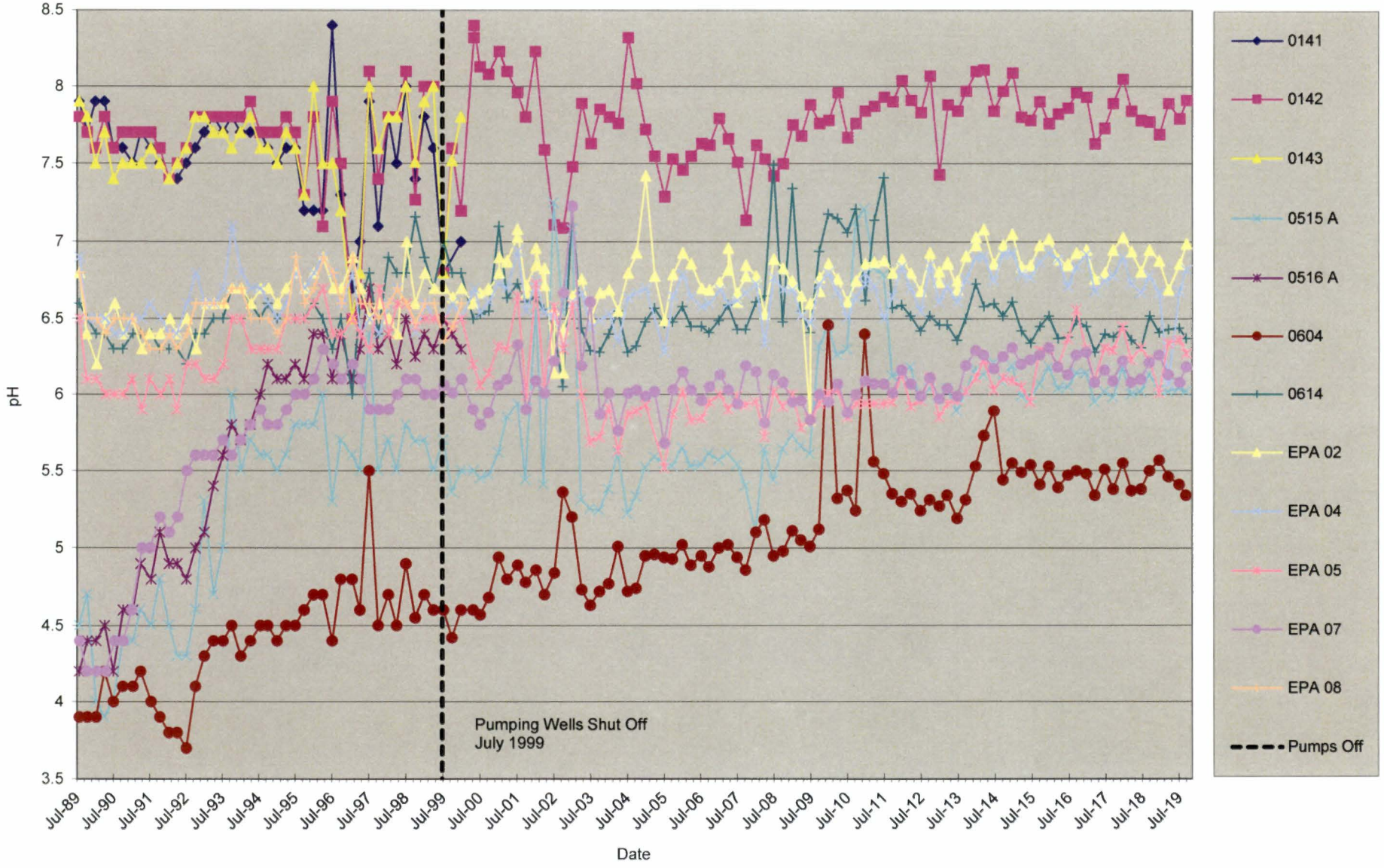


FIGURE 49

United Nuclear Corporation Church Rock Site,
Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

Zone 1 Sulfate Concentrations Over Time

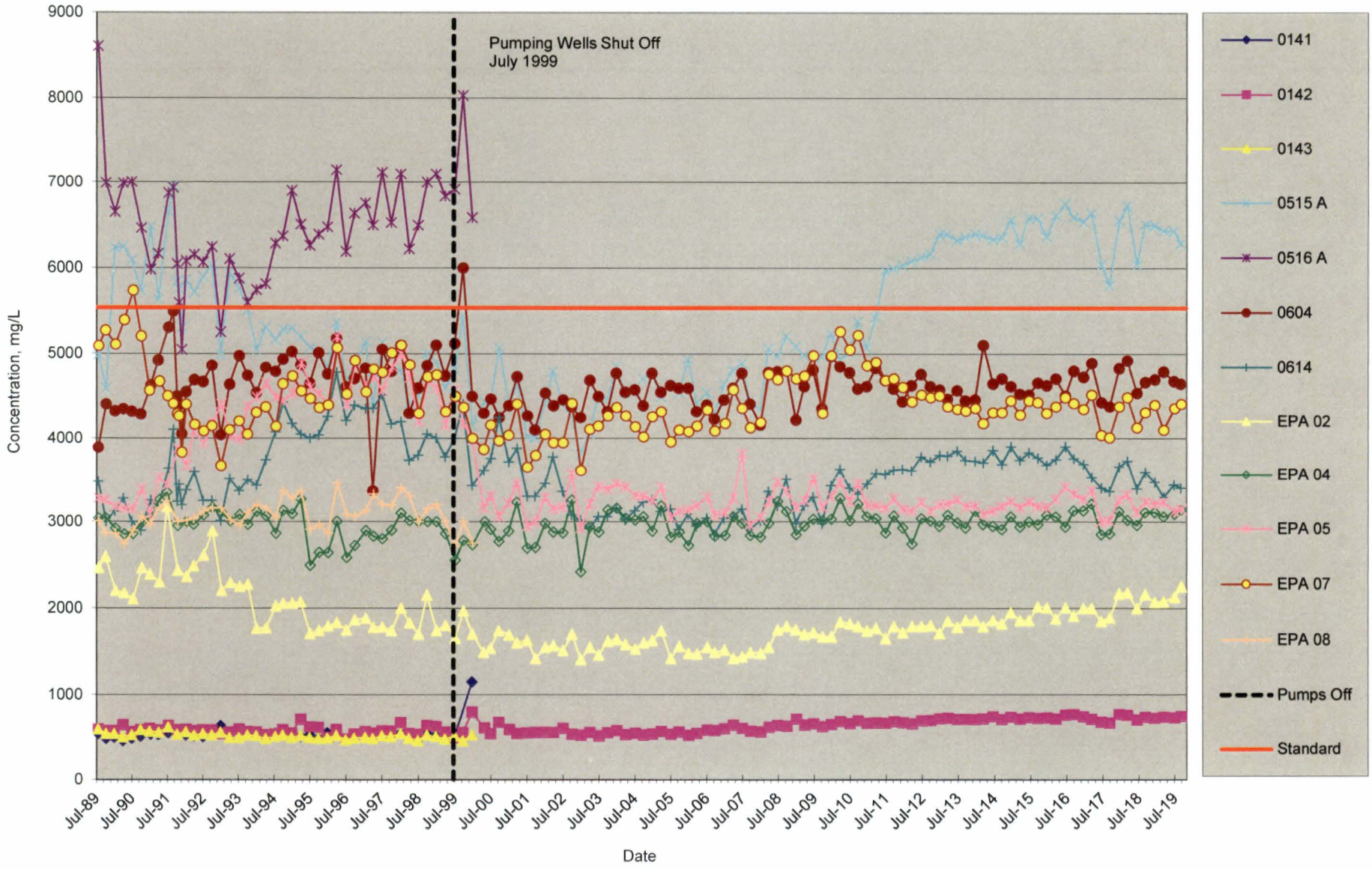
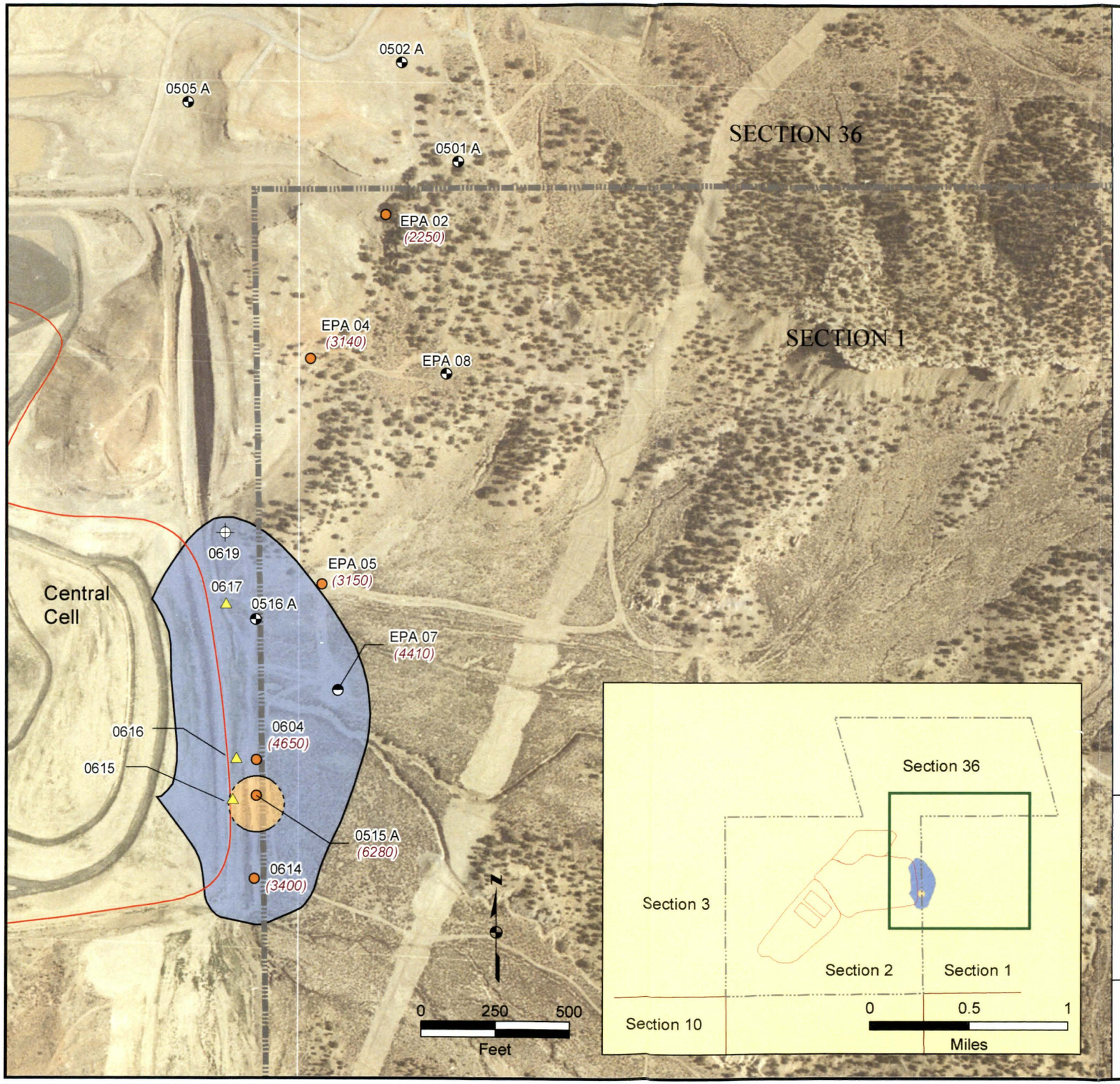


FIGURE 50

United Nuclear Corporation Church Rock Site,
Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES



LEGEND

Well Type

- Water Quality and Level Monitoring
- Former Water Quality and Level Monitoring
- Water Level Monitoring
- Decomissioned East Pump Back
- Revised East Pump Back
- Cell Boundary
- Property Boundary
- Approximate Extent of Zone 1 Seepage Impacts
- Approximate Extent of Sulfate Exceeding 5,539 mg/L, dashed boundary where inferred
- *(3,230)* Sulfate Concentration, mg/L

Notes:

1. Seepage impacts delineated by chloride detections greater than 50 mg/L.
2. Well names are displayed with black text.
3. Aerial photo taken on August 1, 1996.

FIGURE 51

Zone 1 Approximate Extent of Sulfate Exceeding 5,539 mg/L, October 2019

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

Zone 1 Manganese Concentrations Over Time

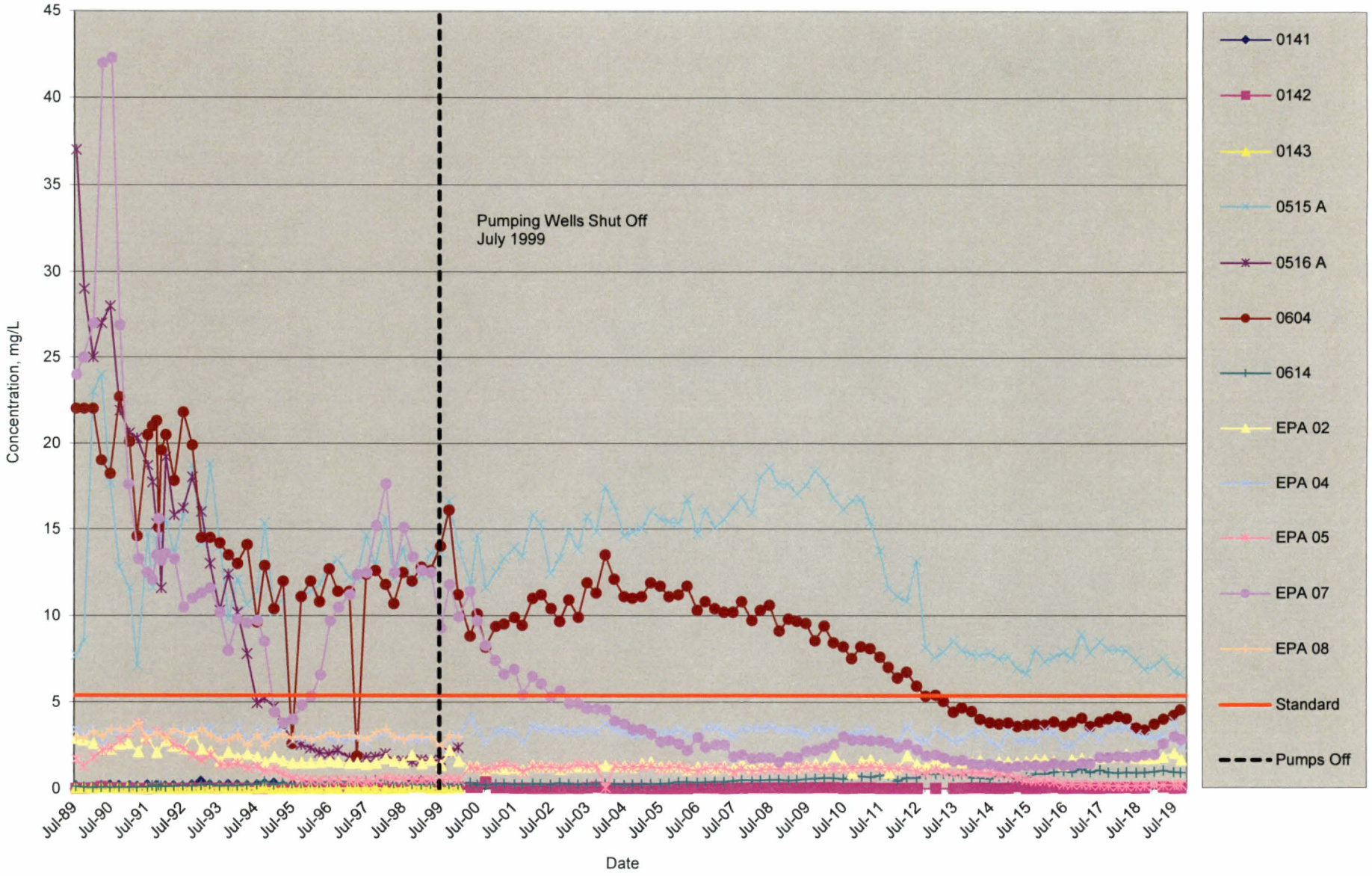


FIGURE 52A

United Nuclear Corporation Church Rock Site,
Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

Zone 1 Manganese vs Bicarbonate Well 515 A Concentrations Over Time

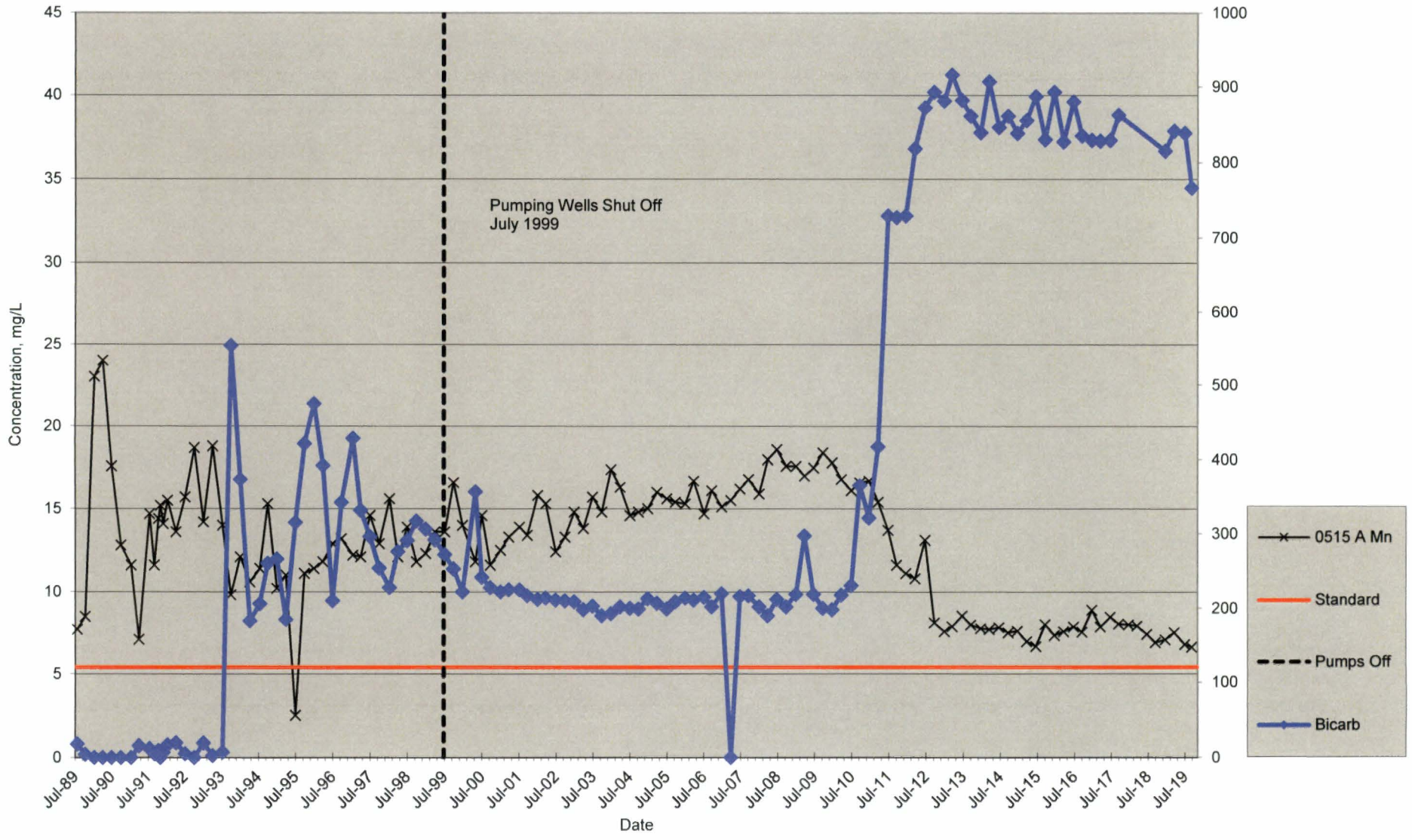
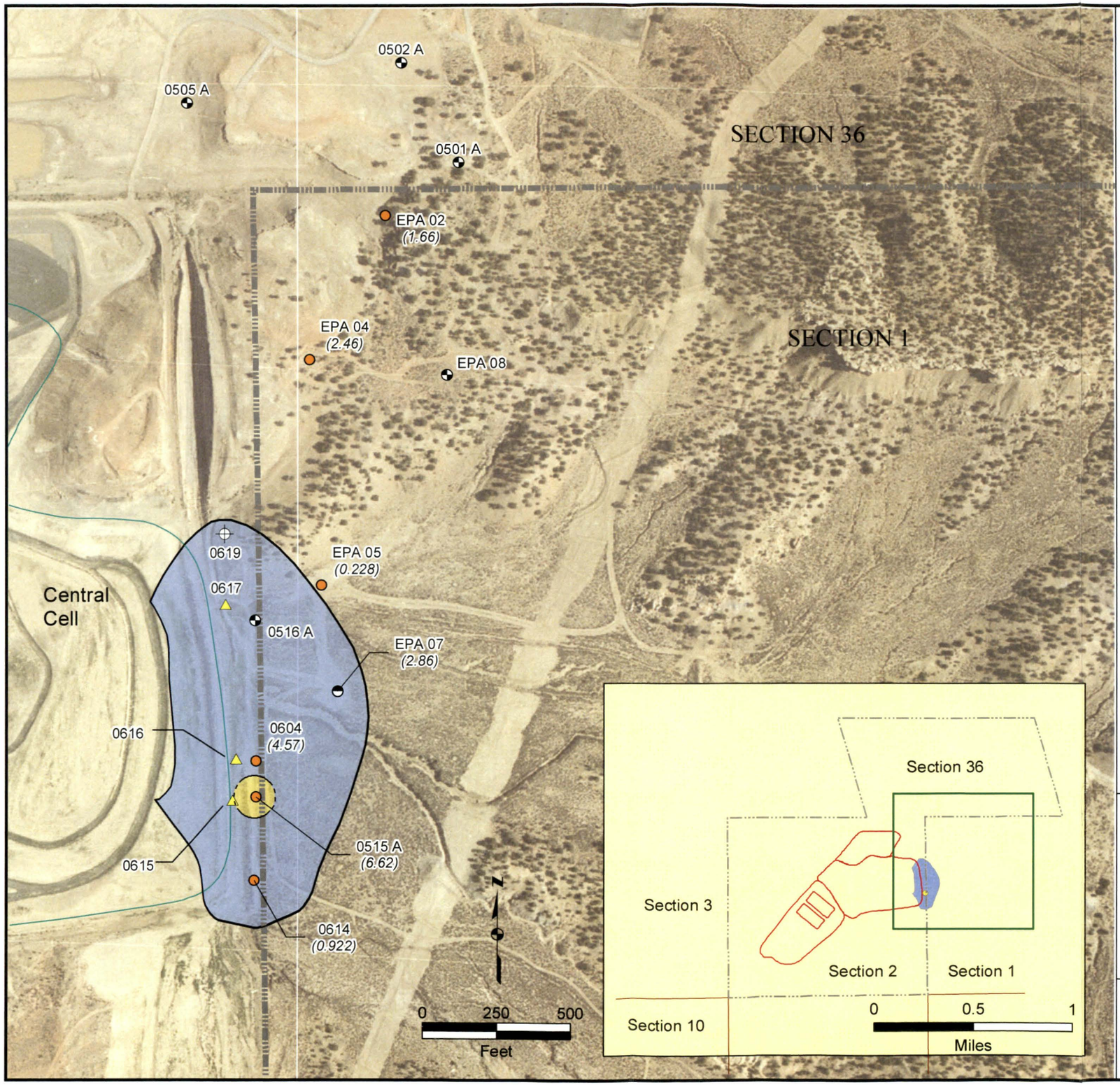


FIGURE 52B

United Nuclear Corporation Church Rock Site,
Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES



LEGEND

Well Type

- Water Quality and Water Level Monitoring
- Former Water Quality and Level Monitoring
- Water Level Monitoring
- Decomissioned East Pump Back
- Revised East Pump Back (Inactive)
- Cell Boundary
- Property Boundary
- Approximate Extent of Zone 1 Seepage Impacts
- Approximate Extent of Manganese Exceeding 5.4 mg/L, dashed boundary where inferred
- *(1.96)* Manganese values in mg/L

Notes:

1. Seepage impacts delineated by chloride detections greater than 50 mg/L.
2. Aerial photo taken on August 1, 1996.

FIGURE 53

Zone 1 Approximate Extent of Manganese Exceeding 5.4 mg/L, October 2019

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

Zone 1 Bicarbonate Concentrations Over Time

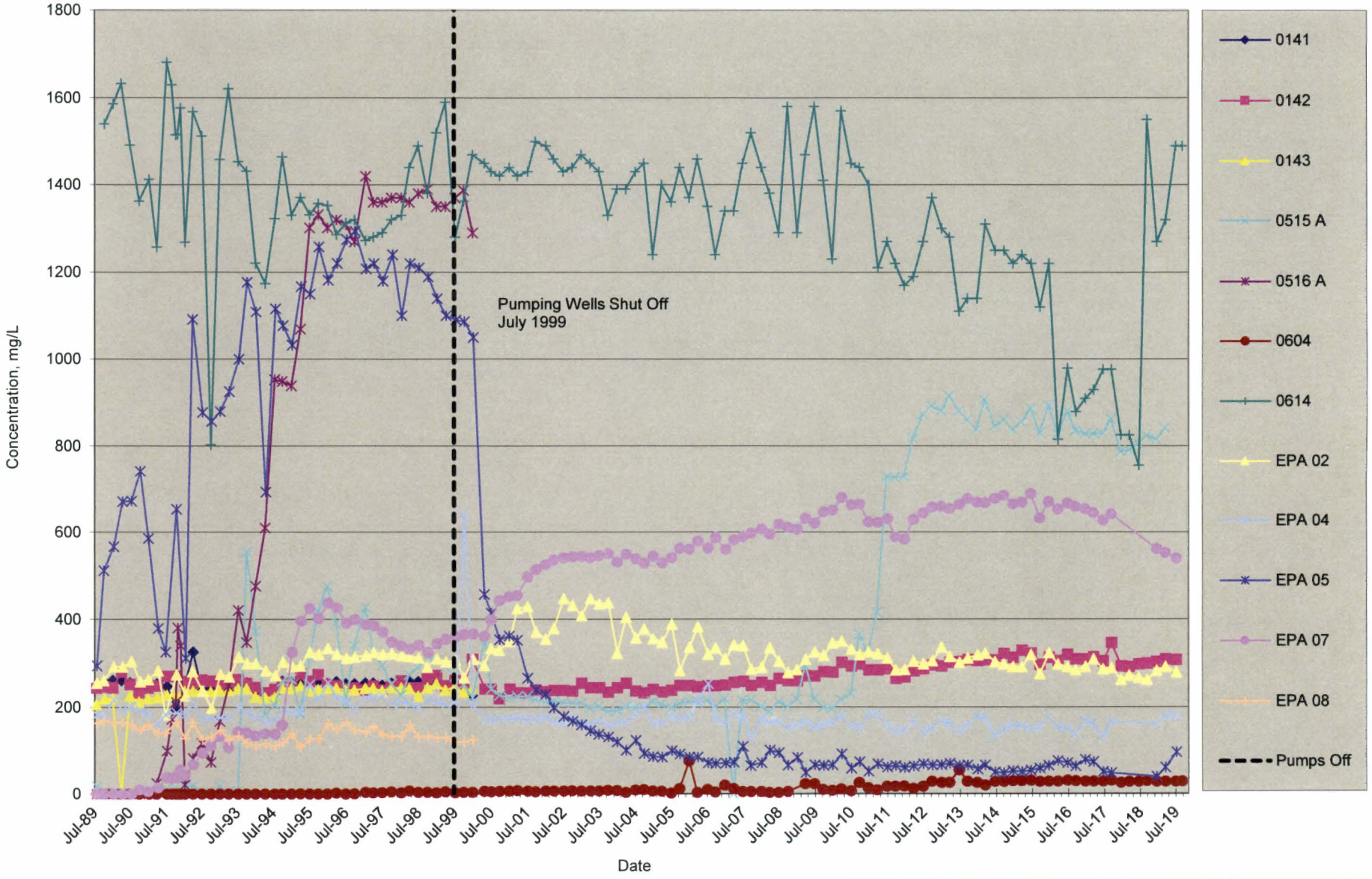


FIGURE 54

United Nuclear Corporation Church Rock Site,
Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

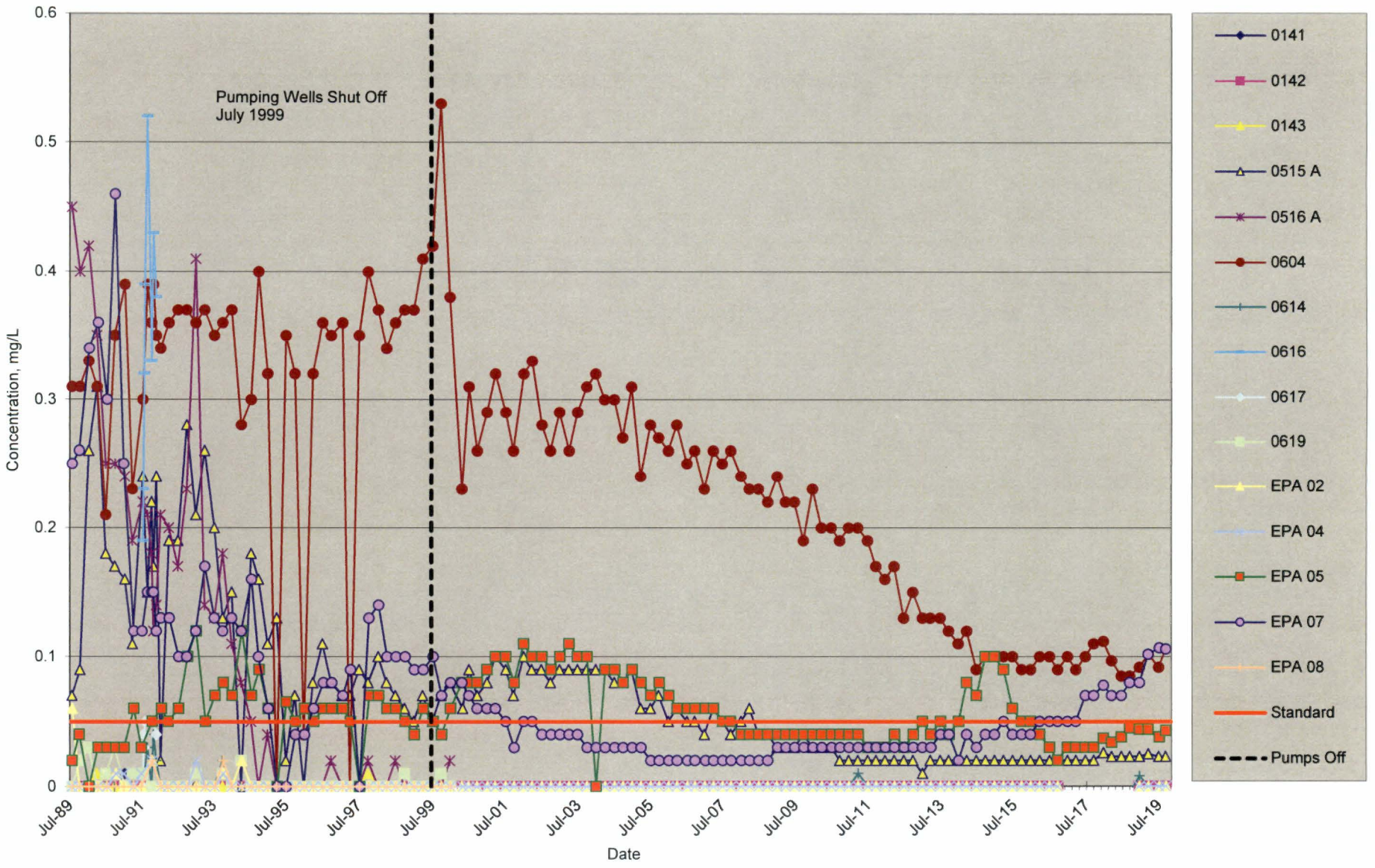


FIGURE 55A

United Nuclear Corporation Church Rock Site,
Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

Zone 1 Cobalt Concentrations Over Time

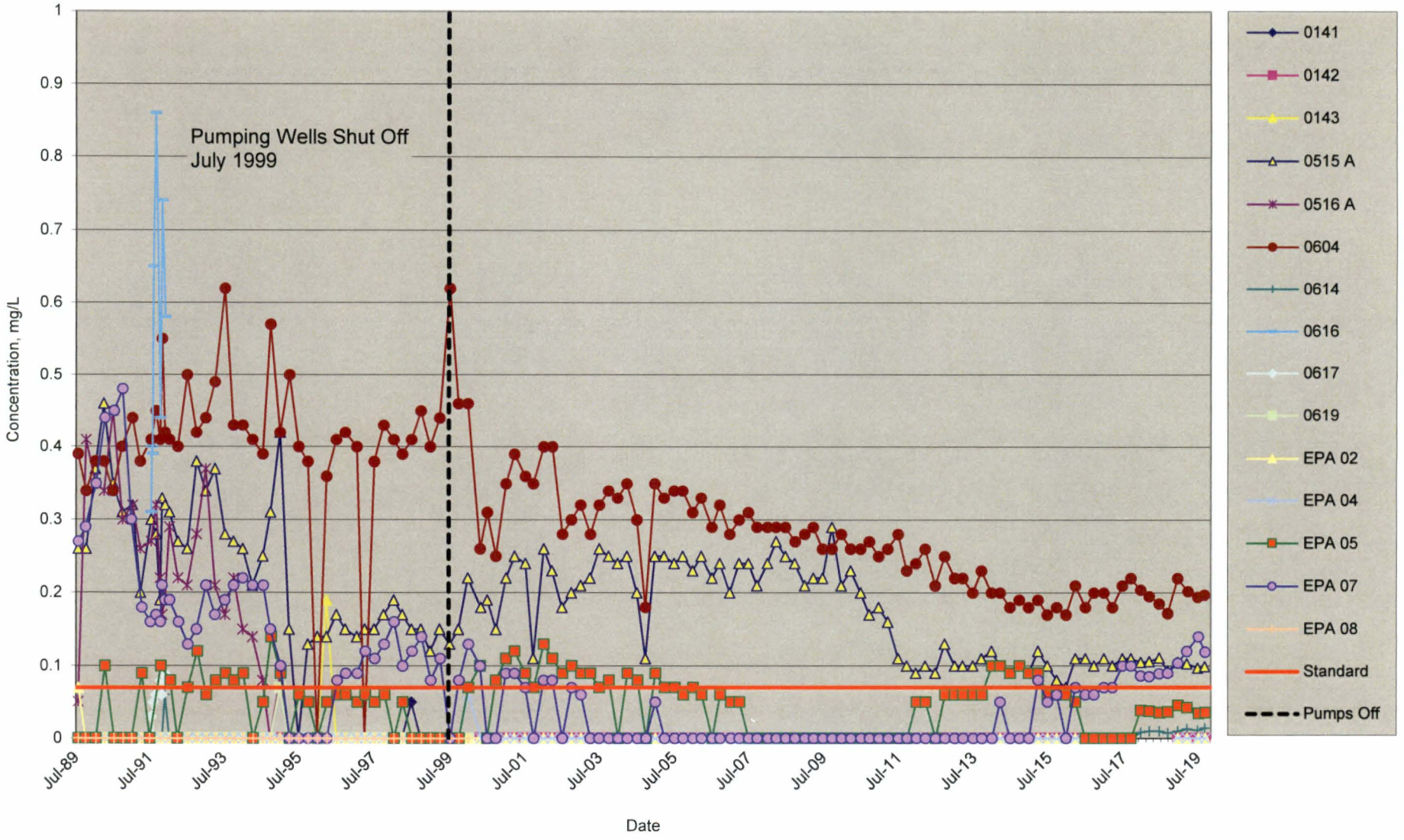
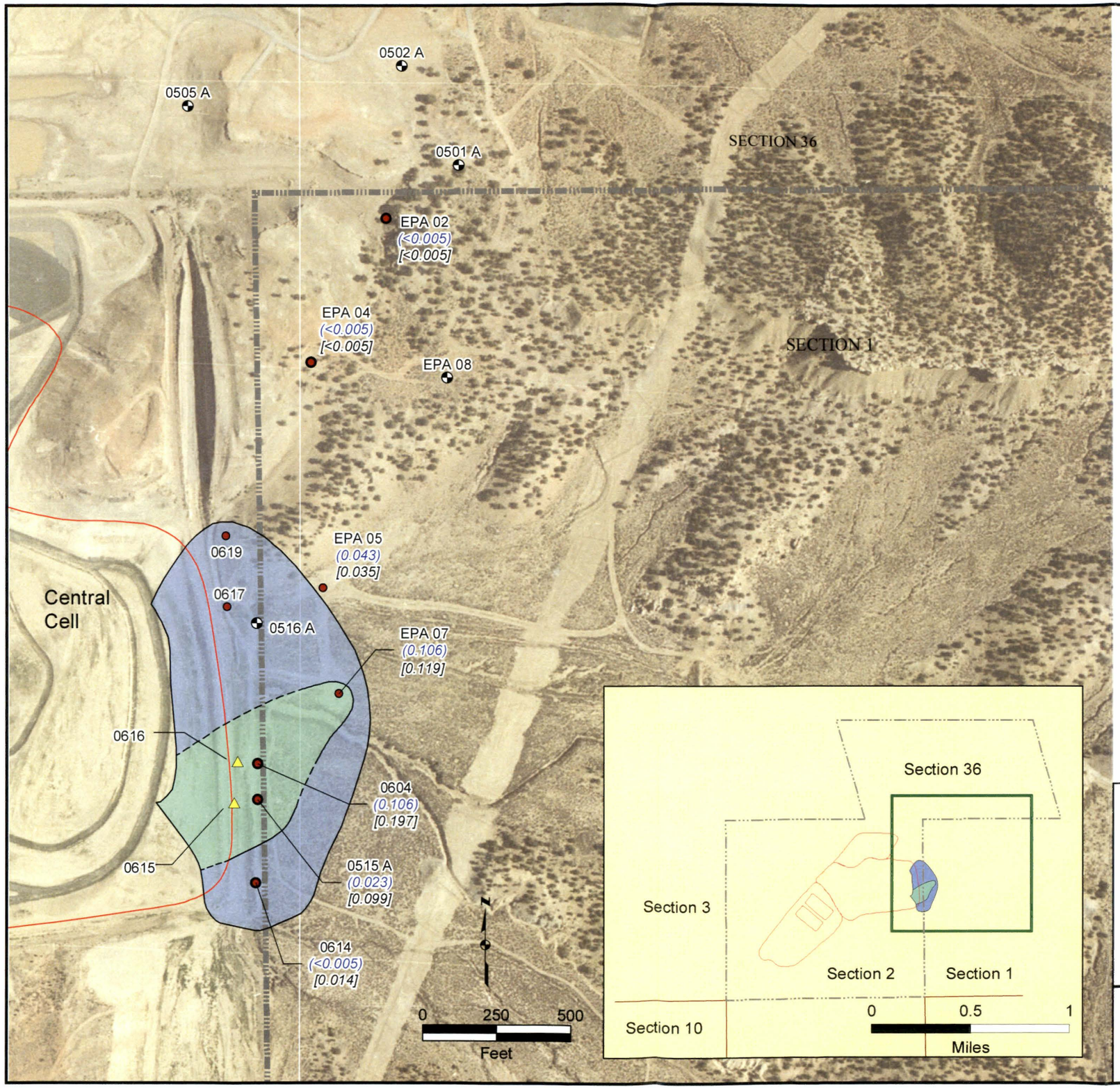


FIGURE 55B

United Nuclear Corporation Church Rock Site,
Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES



LE GEND

Well Type

- Water Quality and Level Monitoring
- Former Water Quality and Level Monitoring
- Water Level Monitoring
- Decomissioned East Pump Back
- Revised East Pump Back
- Cell Boundary
- Property Boundary
- Approximate Extent of Zone 1 Seepage Impacts
- Approximate Extent of Cobalt Exceeding 0.05 mg/L and/or Nickel Exceeding 0.07 mg/l, dashed boundary where inferred

(<0.01) Cobalt Concentration, mg/L
[<0.05] Nickel Concentration, mg/L

Notes:

1. Seepage impacts delineated by chloride detections greater than 50 mg/L.
2. Well names are displayed with black text.
3. Aerial photo taken on August 1, 1996.

FIGURE 56

Zone 1 Approximate Extent of Cobalt Exceeding 0.05 mg/L and Nickel Exceeding 0.07 mg/L, October 2019

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

Zone 1 Combined Radium-226 and Radium-228 Over Time

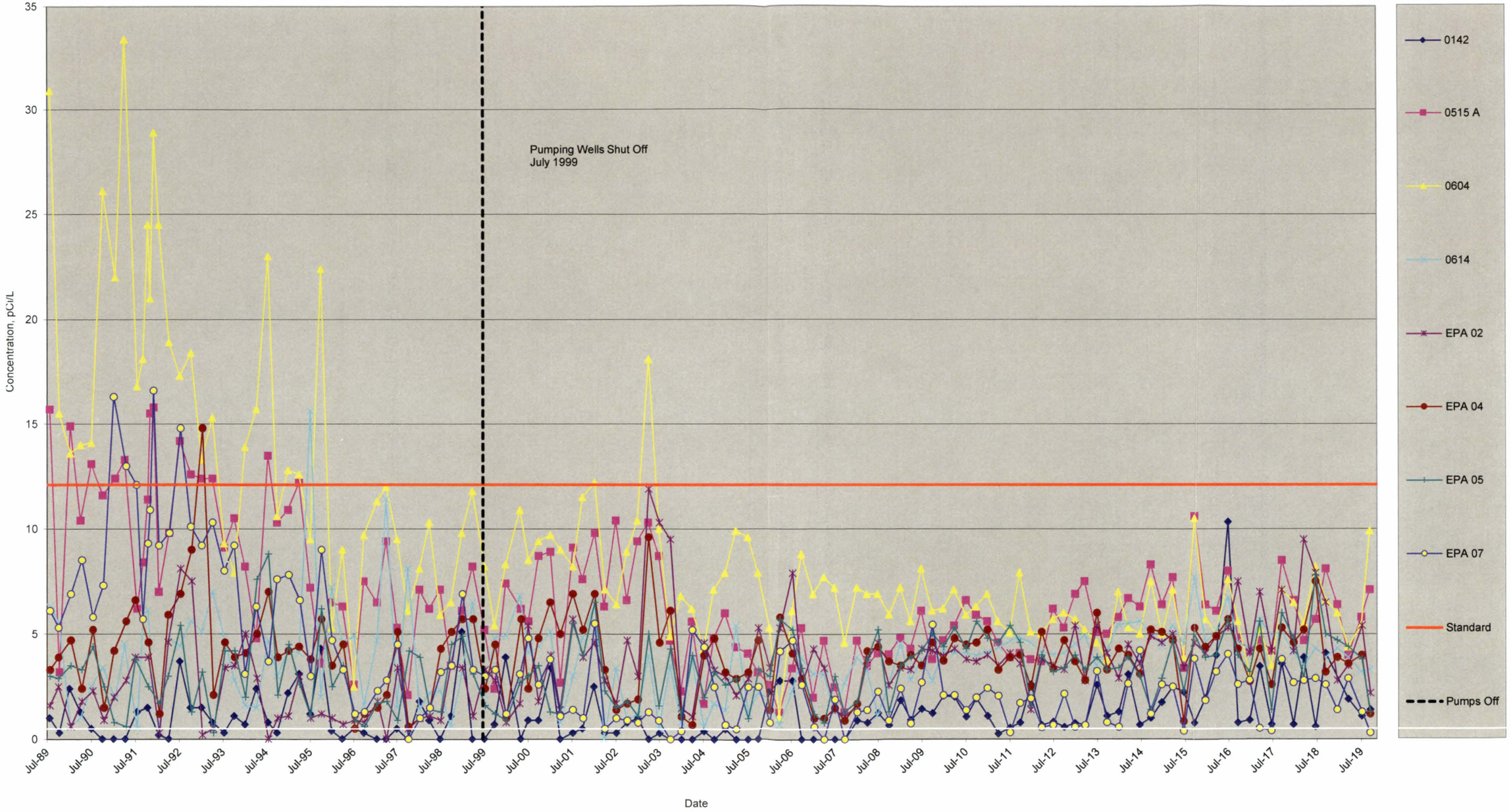


FIGURE 57

United Nuclear Corporation Church Rock Site, Church Rock, New Mexico

wood.

wood.

Tables

TABLE 1A
Chronology of Events
June 1977 to December 2019
UNC Church Rock Mill Tailings Site, Church Rock, New Mexico

Event	Date
The UNC milling operations began.	June 1977
Dam on south tailings disposal cell is breached, releasing an estimated 93 million gallons of uranium mill tailings and pond water to Pipeline Canyon and the Rio Puerco. EPA Region 6 and New Mexico Environmental Improvement Division (NMEID) respond to release.	July 1979
New Mexico Environment Improvement Division orders UNC to implement discharge plan to control contaminated tailing seepage.	October 1979
UNC announces mill closing due to depressed uranium market.	May 1982
Site placed on the National Priorities List (NPL) of Superfund Sites due to off-site migration of radionuclides and chemical constituents in ground-water.	1983
EPA conducts Remedial Investigation (RI) field activities to determine the nature and extent of ground-water contamination in the three water-bearing formations at the Site.	March 1984-August 1987
In 1984, UNC blocked EPA access to the Church Rock facility, and EPA brought an action to compel site access. UNC counterclaimed seeking declaratory and injunctive relief. The U.S. District Court granted an EPA motion to dismiss the UNC counterclaims, and UNC provided access to the Site to EPA. *United States v. United Nuclear Corporation,* 610 F Supp. 527, 528 (D.N.M, 1985).	April 18, 1985
NMEID returns Uranium Mill Tailings Radiation Control Act (UMTRCA) federal regulatory program to the U.S. Nuclear Regulatory Commission (NRC).	June 1986
EPA and NRC sign MOU coordinating EPA's CERCLA ground-water remedial action with NRC's reclamation and closure activities under the Source Materials License.	August 26, 1988
EPA releases RI and Feasibility Study (FS) report along with proposed plan of action field sheet.	August 1988
EPA issues ROD for extraction of contaminated water and evaporation of the extracted water as the remedy for ground-water contamination outside of the Tailings Disposal Site.	September 30, 1988
NRC approves a UNC submitted closure plan for the reclamation of the mill site.	September 1988
UNC submits Remedial Design Report.	April 1989
Remedial action implemented in Zone 1 – Borrow Pit No. 2 dewatered.	April 1989
EPA issues Unilateral Administrative Order (UAO) Docket No. CERCLA 6-11-89 to UNC requiring UNC to implement the Site CERCLA ground-water operable unit remedy determined by the ROD.	June 29, 1989
Remedial action implemented in Zone 3 – 12 new extraction wells begin pumping.	August 1989
Remedial action implemented in Southwest Alluvium – 3 new extraction wells begin pumping.	October 1989
Ground Water Corrective Action Annual Review 1989 documents remedial action construction completion.	December 1989
United States had brought action against UNC in 1991 for response cost recovery under CERCLA; and in late 1992, the U.S. District Court issued an opinion and order granting a U.S. motion for partial summary judgment on the issue of costs and denying a UNC cross motion for summary judgment. *United States v. United Nuclear Corporation,* 814 F Supp. 1552 (D.N.M, 1992).	December 28, 1992
NRC issues a background-water quality study that recommends higher concentrations of background constituents than presented in the ROD.	1996
First Five-Year Review completed.	September 24, 1998
NRC, EPA, and NMED approve the decommissioning of 10 Zone 3 wells, 3 Zone 1 wells, and 1 Southwest Alluvium well because they meet the decommissioning criteria of producing less than 1 gallon per minute (gpm).	July 30, 1999
NRC approves eliminating the Section 1 portion of Zone 3 as a point of exposure.	September 16, 1999

TABLE 1A Chronology of Events June 1977 to December 2019 UNC Church Rock Mill Tailings Site, Church Rock, New Mexico	
UNC submits request to terminate all Zone 3 pumping and for Technical Impracticability waiver to EPA, NRC and NMED.	May 2000
All but three Zone 3 wells decommissioned in accord with criterion.	June 2000
EPA approves UNC's request to shut down remaining three Zone 3 wells to slow seepage migration rate.	November 2000
License Amendment No. 31 allows UNC to temporarily suspend the corrective action pumping in Zone 3.	December 29, 2000
License Amendment No. 32 approves the conversion of the Zone 3 Phase II extraction wells to monitoring wells.	March 8, 2001
UNC submits Draft Tribal Resolution and Environmental Right-of-Way to the Navajo Nation to form basis for ICs.	March 2001
EPA gives UNC approval to temporarily shut down Southwest Alluvium extraction wells and an 18-month Natural Attenuation Test is conducted.	February 2001 through July 2002
UNC submits Final Report and Technical Impracticability Evaluation – Southwest Alluvium Natural Attenuation Test to EPA, NRC and NMED.	November 2002
UNC submits proposal to conduct hydraulic fracturing pilot test.	May 21, 2003
UNC conducts the hydraulic fracturing pilot test in Zone 3.	June 2003
Second Five-Year Review completed.	September 18, 2003
Meeting between EPA, Bureau of Indian Affairs (BIA), and the Department of the Interior (DOI) to discuss access issues in connection with the Site ground-water monitoring program on Navajo Allotment lands.	December 5, 2003
UNC submits Final Report – Hydraulic Fracturing Pilot Test Results and Preliminary Full-Scale Design, United Nuclear Church Rock Facility.	December 2003
EPA comments on the Final Report – Hydraulic Fracturing Pilot Test Results and Preliminary Full-Scale Design and directs UNC to perform supplemental feasibility study (SFS) for Zone 3.	March 10, 2004 and March 19, 2004
EPA approves Final Report - Hydraulic Fracturing Pilot Test Results and Preliminary Full-Scale Design.	May 21, 2004
UNC conducts the Phase 1 full-scale hydraulic fracturing test in Zone 3.	September 2004
UNC installs well SBL-01 in Section 10, Southwest Alluvium.	October 2004
UNC submits the draft SFS for Zone 3 for review.	October 27, 2004
EPA disapproves draft SFS for Zone 3 and directs UNC to perform a Site-Wide Supplemental Feasibility Study (SWSFS) consistent with the NCP.	June 24, 2005
Meeting between EPA, UNC, NRC, NMED, and Navajo Nation EPA (NNEPA) to discuss the SWSFS. UNC generally expresses its opposition to the feasibility study process.	August 17, 2005
Meeting between EPA, NNEPA, BIA and NMED in Window Rock, AZ, to discuss feasibility of ICs restricting the use of contaminated ground water.	January 18, 2006
Meeting between EPA and NNEPA in Dallas, TX, to continue discussions on ICs.	March 16, 2006
EPA approves in-situ alkalinity stabilization pilot study for Zone 3.	May 12, 2006
EPA directs UNC to perform the SWSFS in writing, stating that the feasibility study is appropriate and necessary.	June 23, 2006
Meeting between EPA, NNEPA, BIA, and NMED in Albuquerque, NM to continue discussions on ICs.	August 21, 2006
UNC submits the draft List of Preliminary Assembled Remedial Alternatives for the SWSFS.	September 2006
UNC begins the in-situ alkalinity stabilization pilot study in Zone 3. The study is completed in February 2007.	October 2006

TABLE 1A Chronology of Events June 1977 to December 2019 UNC Church Rock Mill Tailings Site, Church Rock, New Mexico	
UNC submits the draft SWSFS, Part 1, Church Rock Remediation Standards Update.	February 2007
UNC submits In-Situ Alkalinity Stabilization Pilot Study Report.	June 2007
EPA disapproves SWSFS, Part 1, Church Rock Remediation Standards Update and requires revision to address written comments.	January 2008
Meeting between EPA, State, NRC, NNEPA and UNC to discuss status of remedial activities. UNC notifies regulatory agencies that pumping of hydraulic fracture wells in Zone 3 was unsuccessful in stopping migration of seepage impacted ground-water. UNC proposes to submit a plan for additional extraction wells for Zone 3.	March 12, 2008
UNC submits summary of hydrogeologic analysis evaluation of groundwater flow and recommended plan for additional extraction wells for interception and recovery of seepage-impacted ground-water in Zone 3.	April 2008
UNC submits white paper on statistics to address some of EPA comments on the SWSFS, Part 1.	May 2008
EPA notifies NRC of approval of UNC's recommendation for additional extraction wells.	June 2008
UNC installs five new extraction wells (the NW-series) in northern Zone 3.	September 2008
EPA issues third Five-Year Review report for the UNC groundwater operable unit.	September 2008
UNC submits calculation of background statistics with comparison values.	October 2008
UNC submits calculation of estimated UCL95 statistics and exposure point concentrations in impacted groundwater.	December 2008
UNC submits to NRC an alternate concentration limits application for Zone 1.	December 2008
Pumping of the NW-series of extraction wells in northern Zone 3 begins. Later in the year the pumping scheme was reorganized to include three of the five wells.	February 2009 and November 2009
EPA issues comment letter on Site-Wide Supplemental Feasibility Part I (Church Rock Remediation Standards Update) and approves Part I (approval later effectively rescinded by EPA comments letters).	February 2009
UNC submits revised Site-Wide Supplemental Feasibility Study Part II.	July 2009
UNC submits hydrogeologic analysis of recent Zone 3 injection testing (new background well NBL-2) in northern Zone 3 and proposal to enhance remediation using one or more injection wells amended with sodium bicarbonate.	December 2009
UNC proposes the location for a pilot injection well in Zone 3.	April 2010
UNC submits a remedial design report on a conceptual approach to enhanced remediation in Zone 3 involving new injection wells combined with existing extraction wells.	May 2010
UNC submits a hydrogeologic analysis of injection testing of Zone 3 well IW-A during July 2010.	August 2010
EPA issues comments letter on revised Site-Wide Supplemental Feasibility Study Part II (UNC document from July 2009).	September 2010
UNC submits an updated baseline human health risk assessment.	March 2011
UNC submits revised Site-Wide Supplemental Feasibility Study Parts I and II.	April 2011
UNC starts injection at well IW-A of site Mill well water amended with alkalinity (sodium bicarbonate).	April 14, 2011
EPA issues comment letter on the draft updated human health risk assessment (March 2011).	July 2011
UNC submits a technical memorandum summarizing two previously submitted reports on Zone 3 tailings seepage sourcing and groundwater recharge, with an information update.	August 2011
EPA issues comment letter on the Site-Wide Supplemental Feasibility Study Part II (July 2009) (in fact, this comment letter addressed Parts I, II, and III).	October 2011
UNC submits provisional responses to EPA comment letter (July 2011) on the draft baseline human health risk assessment (March 2011).	October 2011
UNC submits hydrogeologic assessment of injection at Zone 3 well IW-A through September 2011.	November 2011

TABLE 1A
Chronology of Events
June 1977 to December 2019
UNC Church Rock Mill Tailings Site, Church Rock, New Mexico

UNC submits a document requesting discussion and clarification about the EPA comment letter (October 14, 2011) addressing revised Site-Wide Supplemental Feasibility Study Parts I and II (April 2011).	November 2011
By email, UNC provides all agency stakeholders with revisions to the draft updated human health risk assessment (March 2011).	February 2012
EPA risk assessment specialist provides UNC with comments (by email) on the revised draft updated human health risk assessment (February 2012). Followup phone discussion between EPA risk specialist and UNC on April 27, 2012	March 2012 and April 27, 2012
GE submits to NRC a license amendment request for revised groundwater protection standards based on updated background concentrations (statistically calculated background threshold values). The three site hydrostratigraphic units are addressed individually.	April 2012
UNC presents the numeric groundwater hydraulic modeling (with focus on Zone 3) to all agency stakeholders at the annual technical meeting in Albuquerque.	May 14, 2012
UNC makes an operational adjustment of pumping in the northernmost part of Zone 3.	June 2012
UNC submits to EPA: Overview of Draft Attached Tables, Summary Comparisons of Upper Prediction Limits for Parameter Concentrations in Background Groundwater to Site Cleanup Standards and Potential ARARs for All Three Hydrostratigraphic Units at the Church Rock Mill Tailings Site.	June 2012
UNC has their laboratory reduce the reporting limits for beryllium and lead.	July 2012
UNC submits to EPA the Updated Baseline Human Health Risk Assessment – Final, Church Rock Site, Church Rock, New Mexico, United Nuclear Corporation, Gallup, New Mexico.	August 2012
EPA approves the final version of the Updated Baseline Human Health Risk Assessment (August 13, 2012).	September 2012
UNC notifies the agencies that injection of sodium bicarbonate-amended water, in Zone 3 well IW-A, was terminated on June 29, 2012.	October 2012
UNC submits the Groundwater Flow Model of the Church Rock Site and Local Area.	October 2012
UNC submits to NRC Supplemental Information Pertaining to License Amendment Request (April 2012) for Revised Groundwater Protection Standards.	November 2012
UNC sends the agencies an email with discussion of turbidity results from July 2012 and October 2012.	December 2012
EPA issues Record of Decision (ROD) for the Site Surface Soil Operable Unit Alternative 2 preference for disposal of NECR mine waste at UNC Mill Site tailings evaporation ponds under NRC license SUA-1475.	March 2013
EPA Office of Research and Development (ORD) issues technical memorandum on the background ground water conditions in the SWA and Zones 1 and 3 of UNC Site and the proposed cleanup and compliance monitoring levels for COPCs using the statistically-based 95 percent upper prediction limits (UPL95s) (also known as "Overview of Draft Attached Tables, Summary Comparisons of Upper Prediction Limits for Parameter Concentrations in Background Groundwater to Site Cleanup Standards and Potential ARARs for All Three Hydrostratigraphic Units at the Church Rock Mill Tailings Site.")	March 2013
DOE issues comments to NRC regarding the April 2012 UNC License Amendment Request for Revised Groundwater Protection Standards Based on Updated Background Concentrations.	April 2013
NRC issues response to DOE comments on the April 2012 UNC License Amendment Request for Revised Groundwater Protection Standards Based on Updated Background Concentrations.	June 2013
NRC issues Request for Additional Information (RAI) pertaining to License Amendment Request (April 2012) for Revised Groundwater Protection Standards.	June 2013
EPA issues fourth Five-Year Review report for the UNC Superfund Site	September 2013
NNEPA formally requests that UNC locate, permit, drill, construct and operate sentinel wells on north of the UNC Church Rock Mill Site Section 36 boundary.	October 2013
UNC submits to NRC a response to the RAI pertaining to License Amendment Request (April 2012) for Revised Groundwater Protection Standards.	January 2014
UNC submits to NRC a revised groundwater flow model report.	June 2014
NRC issued a draft Environmental Assessment (EA) pertaining to the License Amendment Request (April 2012) for Revised Groundwater Protection Standards for review by other governmental agencies.	August 2014

TABLE 1A Chronology of Events June 1977 to December 2019 UNC Church Rock Mill Tailings Site, Church Rock, New Mexico	
UNC submits proposed sentinel well locations north of the UNC Church Rock Mill Site Section 36 boundary.	September 2014
EPA and NMED issue comments to NRC regarding August 2014 EA pertaining to the License Amendment Request (April 2012) for Revised Groundwater Protection.	October 2014
UNC submits proposed potential cleanup levels to EPA: updated Overview of Draft Attached Tables, Summary Comparisons of Upper Prediction Limits for Parameter Concentrations in Background Groundwater to Site Cleanup Standards and Potential ARARs for All Three Hydrostratigraphic Units at the Church Rock Mill Tailings Site (March 29, 2015).	March 2015
NRC issues License Amendment No. 52 on April 9, 2015 which approves the April 2012 license amendment request related to revised groundwater protection standards (based on updated statistically calculated background threshold values). The three site hydrostratigraphic units are addressed individually.	April 2015
EPA indicates that UNC may proceed with the SWSFS using the March 2015 proposed potential cleanup levels.	September 2015
GE submits to NRC a License amendment request (October 22, 2015) to update the license for progress and changes that have taken place with respect to corrective action program and the on-going re-design and environmental review of the tailings disposal impoundment to incorporate mine spoil. Some editorial and typographical corrections are also proposed (including corrections to License standards). This license amendment request was intended to withdraw and replace a previous request dated January 22, 2015.	October 2015
UNC submits to EPA a letter describing how the proposed monitoring well network on the Navajo Reservation will be used to collect the hydrogeochemical information needed to establish areas where future administrative controls would be applied, in support of a future remedy.	April 2016
EPA and the Navajo Nation approve the proposed monitoring well locations on the Navajo Reservation and agree that UNC that should proceed with the plan to permit and install monitoring wells north of the Section 36 boundary on the Navajo Reservation (email from Janet Brooks to Roy Blickwedel, July 27, 2016).	July 2016
EPA requests quarterly reporting of northern Zone 3 monitoring well sampling, starting with October 2016 monitoring event.	August 2016
GE/UNC requests (December 8, 2016, corrected February 13, 2017) to amend previous License amendment request that was submitted on October 22, 2015. The amendment is to remove well GW2 as a POC well for the Southwest Alluvium. All other aspects of the October 22, 2015 request remain the same.	February 2017
UNC submitted a working draft of the Site-Wide Supplemental Feasibility Study (SWSFS) Part III to EPA for comment.	January 2017
UNC submits to the Navajo Nation Department of Water Resources (Technical, Construction and Operations Branch [TCOB]), a preliminary well drilling permit application on April 25th, 2017, for the proposed monitoring wells on the Navajo Reservation. The permitting process is ongoing.	April 2017
GE/UNC submits to NRC a License amendment request that withdraws the October 2015, December 2018, and February 2017 requests and replaces them with a comprehensive resubmission that addresses all the requests, amended requests, and corrections in a single request.	May 2018
EPA issues the fifth Five-Year Review report for the UNC Superfund Site.	September 2018
UNC submits to NRC an Application for Amendment of USNRC Source Material License to support GE/UNC's request to to modify the reclamation plan described in License Condition 34 as well as the reclamation timelines defined in License Condition 35. Proposed activities at the site include construction of a Repository for mine-impacted soil and debris on the licensed mill tailings disposal area.	September 2018
GE/UNC withdraws the May 2018 License amendment request (to approve well abandonments). UNC will reconsider making the License amendment request as the NRC action on the mine spoil repository amendment request proceeds.	May 2019
UNC initiates the installation of three sentinel monitoring wells north of the Section 36 boundary on the Navajo Reservation as requested by the Navajo Nation EPA The wells were installed in support of the Site-Wide Supplemental Feasibility Study (SWSFS) and the potential development/adoption of waivers, alternate standards or administrative/institutional controls to close the corrective action program.	December 2019

TABLE 1B

Southwest Alluvium Performance Monitoring Program, 2019 Operating Year
United Nuclear Corporation, Church Rock Site
Church Rock, New Mexico

Well	Use[1]	Water Level	Water Quality	NRC POC	Purpose
509 D	Monitor	X	X	Y	Seepage extent
624	Monitor	X	X		Downgradient background, seepage extent
627	Monitor	X	X		Downgradient background, seepage extent
632	Monitor	X	X	Y	Seepage extent
801[2]	Pumping (idled)	X	X		Seepage and saturation extent
802	Pumping (idled)	X	X		Seepage and saturation extent
803	Pumping (idled)	X	X		Seepage and saturation extent
805	Monitor	X			Water level only
807	Monitor	X			Water level only
808[3]	Pumping (idled)	X	X		Seepage extent
EPA 23	Monitor	X	X	Y	Problematic completion
EPA 25	Monitor	X	X		Downgradient background, seepage extent
EPA 28	Monitor	X	X	Y	Seepage extent
GW 1	Monitor	X	X	Y	Seepage extent
GW 2[4]	Monitor	X	X	Y	Seepage extent
GW 3[4]	Monitor	X	X	Y	Downgradient background, seepage extent
	Total	16	14		

Eliminated From Monitoring					Reason for Elimination
GW 4	X	X			Dry
EPA 22A				Y	Dry
29A					Dry
639					Dry
642					Dry
644					Dry
645					Dry
804					Not needed, use 632
806					Not needed, use 805
EPA 27					Dry

Notes:

1 Pumping wells turned off in January 2001 after final baseline samples were collected. Well 801 is the exception, see Note 2.

2 Well 801 was turned off at the end of July 1999 because it met decommissioning criteria. Sample collection ceased after the first quarter 2000. Well 801 water quality is included in the test program, therefore sampling recommenced January 2001 and has continued through 2019.

3 Well 808 was not included in the Performance Monitoring Program prior to the NA Test, therefore no data are available prior to January 2001.

4 Wells GW 2 and GW 3 are very close to the Pipeline Arroyo canyon and can no longer be accessed due to safety concerns.

5 Well SBL 1 is not a formal requirement of the performance monitoring program, but it is also monitored for both water level and water quality.

wood.

TABLE 2

Detected Constituents in Southwest Alluvium, October 2019
United Nuclear Corporation, Church Rock Site
Church Rock, New Mexico

Chemical Name	License NRC Standard	EPA Cleanup Level	Unit	0509 D	0624	0627	0632	0801	0802	0803	0808	EPA 23	EPA 25	EPA 28	EPA 28 FD	GW 1	SBL-01
			Section #	2	3	3	2	2	2	2	2	2	3	3	3	3	10
ALUMINUM	-	5	mg/l		0.27		0.04	0.12							0.05		0.22
AMMONIA (AS N)	-	-	mg/l	0.14				3.6 D		0.37	0.79	0.17					
ARSENIC	0.05	0.01	mg/l	0.001													
BERYLLIUM	0.05	0.004	mg/l														
BICARBONATE (HCO3)	-	-	mg/l	2250	1620	568	1730	1490	2010	1600	1880	1350	1410	425	432	1760	415
CADMIUM	0.025	0.025	mg/l														
CALCIUM	-	-	mg/l	781	605	531	553	546	680	631	621	670	780	505	502	718	483
CHLORIDE	-	250	mg/l	331 D	221 D	31 D	245 D	213 D	188 D	156 D	180 D	126	148 D	98 D	102 D	243 D	76 D
COBALT	-	0.05	mg/l	0.008								0.007					0.031
GROSS ALPHA	15	15	pci/l	0.7	1.1	0.7 D	1.5	1.3	1.3	1.1	1.4	1	0.3 U	0.8	1.1	0.5	1
LEAD	0.07	0.07	mg/l			0.004					0.001						
LEAD-210	5.9	5.9	pci/l	0.4	0.2	1.1	1.6	0.1	0.2	0.4	0.4	0.7			0.3	0.01	
MAGNESIUM	-	-	mg/l	459	438	232	752	679	728	667	698	402	249	465	461	534	1260
MANGANESE	-	2.1	mg/l	1.85 D	0.11 D	0.07	2.12 D	3.1 D	1.32 D	2.75 D	1.68 D	3.9	0.16 D	0.476 D	0.5 D	.005 D	3.52 D
MOLYBDENUM	-	1	mg/l					0.001									
NICKEL	0.078	0.2	mg/l	0.007			0.011	0.012	0.007	0.007	0.006			0.012	0.01	0.009	0.126
NITRATE (NO3)	-	536.6	mg/l	19.3 D	70.5 D	70 D	36.5 D	37 D	70.5 D	27.7	24.5 D	2.65	64 D	3.47 D	3.56 D	66 D	35.8 D
PH (FIELD)	-	-	su	6.54	6.73	7.04	6.64	6.75	6.69	6.72	6.64	6.78	6.66	7.01	6.97	6.79	6.74
PH (LAB)	-	-	su	6.65 H	6.66 H	7.0 H	6.59 H	6.76 H	6.6 H	6.63 H	6.64 H	6.79	6.85 H	6.97 H	7.03	6.8 H	6.79 H
POTASSIUM	-	-	mg/l	15	7	6	10	13	6	12	11	12	9	11	11	10	14
RADIUM-226	-	-	pci/l	0.4	0.5	0.4	0.6	0.4	0.2	0.3	0.3	0.5	0.1	0.5	0.6	0.3	0.4
RADIUM-228	-	-	pci/l	1	-1	0.2	1.2	0.5 U	0.3 U	0.3	1.3	0.8 U		0.6 U	0.6		1
RADIUM 226 & 228	8.2	8.2	pci/l	1.4	-0.5 U	0.6	1.8	0.9 U	0.5 U	0.6	1.6	1.3	0.1	1.1 U	1.2	0.3	1.4
SELENIUM						0.018 D		0.002									0.016 D
SODIUM	-	-	mg/l	412	332	374	383	353	337	269	345	165	227	257	253	406	286
SULFATE (SO4)	-	5815	mg/l	2400 D	2340 D	2330 D	3530 D	3330 D	3110 D	3220 D	3290 D	2340 D	1890 D	3200 D	3180 D	2740 D	6210 D
THORIUM-230	4.5	4.5	mg/l	0.03	0.003		0.08	0.02	0.07	0.04	0.1	0.007	0.02	0.006	0.1	0.008	
TOTAL DISSOLVED SOLIDS (LAB)	-	10376	mg/l	5870 DH	5280 DH	4140 D	6810 DH	6430 DH	6670 DH	6270 DH	6480 DH	4790 DH	4450 D	5020 DH	5000 DH	5960 DH	9200 DH
TOTAL TRIHALOMETHANES (CHLOROFORM)	80	80	ug/l				0.72		1.3							0.6	
URANIUM	0.3	-	mg/l	0.216	.037 D	0.018	0.0713	0.0373	0.136	0.0736	0.0802	0.0333	0.114 D	0.0203	0.0214	0.125	0.005 D
VANADIUM	0.1	0.1	mg/l														

Blank cells indicate that the analyte was not detected
Shaded values exceed the listed action level
D indicates that the sample was diluted for analysis
H indicates that the analysis was performed beyond the analytical method holding time
FD indicates a field duplicate sample

wood.

TABLE 3

Southwest Alluvium Saturated Thickness, October 2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Well	Water Level Measurement Date	SW Alluvium Unsaturated Thickness	SW Alluvium Saturated Thickness	SW Alluvium Percentage Saturated
0509 D	10/9/2019	83.96	26.04	24%
0624	10/11/2019	56.84	18.16	24%
0627	10/11/2019	62.93	8.07	11%
0632	10/10/2019	49.20	17.80	27%
0801	10/10/2019	54.95	5.55	9%
0802	10/10/2019	52.66	28.84	35%
0803	10/9/2019	67.78	50.22	43%
0805	10/15/2019	55.32	64.68	54%
0807	10/15/2019	61.20	38.80	39%
0808	10/9/2019	54.21	77.79	59%
EPA 23	10/9/2019	59.08	60.92	51%
EPA 25	10/11/2019	56.94	13.06	19%
EPA 28	10/10/2019	66.19	11.81	15%
GW 1	10/10/2019	66.15	10.85	14%
GW 2	NM	-	-	-
GW 3	NM	-	-	-
SBL-01	10/11/2019	49.76	15.24	23%

NM - Not Measured

wood.

TABLE 4

Summary of Operational Data
Southwest Alluvium Extraction Wells 1989 to 2001
United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Well No.	Annual Average Pumping Rate (gallons per minute)												
	1990 [1]	1991 [2]	1992 [3]	1993 [4]	1994 [5]	1995 [6]	1996 [7]	1997 [8]	1998 [9]	1999 [10]	2000 [11]	2001 [12]	1990-2001
801 [13]	1.2	0.5	0.4	0.2	0.2	0.1	0.1	0.1	0.08	0.08	0.00	0.00	0.25
802	11.1	12.5	11.9	9.0	9.8	9.7	9.1	10.1	11.02	9.62	9.31	5.80	9.91
803	2.0	2.6	2.5	3.0	3.2	3.5	3.1	2.9	3.84	3.56	3.83	3.68	3.14
808 (14)		10.0	15.5	19.9	15.6	12.3	12.2	7.2	4.34	3.50	2.50	3.35	9.67
Total Pumping Rate	14.3	25.6	30.3	32.1	28.8	25.6	24.5	20.3	19.29	16.76	15.64	11.94	22.98
Volume Pumped (millions of gallons) (15)	7.4	12.4	17.2	18.1	15.7	12.9	12.2	9.2	9.0	7.5	7.7	1.7	131.0

Notes:

1. Average pumping rate calculated for the period between October 13, 1989, and October 12, 1990.
2. Average pumping rate calculated for the period between October 13, 1990, and October 11, 1991, except Well 808, which calculated for the period between June 26, 1991 (i.e., well startup) and October 11, 1991.
3. Average pumping rate calculated for the period between October 12, 1991, and October 8, 1992.
4. Average pumping rate calculated for the period between October 9, 1992, and October 8, 1993.
5. Average pumping rate calculated for the period between October 9, 1993, and October 14, 1994.
6. Average pumping rate calculated for the period between October 15, 1994, and September 29, 1995.
7. Average pumping rate calculated for the period between September 30, 1995, and September 27, 1996.
8. Average pumping rate calculated for the period between September 28, 1996, and September 26, 1997.
9. Average pumping rate calculated for the period between September 27, 1997, and September 25, 1998.
10. Average pumping rate calculated for the period between October 02, 1998, and September 27, 1999.
11. Average pumping rate calculated for the period between September 28, 1999, and September 29, 2000.
12. Average pumping rate calculated for the period between September 30, 2000, and January 12, 2001.
13. Well 801 decommissioned at the end of July 1999.
14. Well 808 began operation on June 26, 1991.
15. Data obtained from system flowmeter.

Source: Earth Tech, December 2002, Figure 2.1

wood.

TABLE 5

Southwest Alluvium Groundwater Velocities, October 2019
United Nuclear Corporation, Church Rock Site
Church Rock, New Mexico

Well Pair 805 and 624

Groundwater Elevations: 6854.63 (Well 805) and 6841.45 (Well 624) ft amsl
Separation Distance: 1902 ft
Average Linear Horizontal Hydraulic Gradient: 0.0069
Velocity 1 = 66 ft/yr
Velocity 2 = 51 ft/yr
Average Velocity = 59 ft/yr

Well Pair 805 and 627

Groundwater Elevations: 6854.63 (Well 805) and 6829.06 (Well 627) ft amsl
Separation Distance: 3203 ft
Average Linear Horizontal Hydraulic Gradient: 0.0080
Velocity 1 = 76 ft/yr
Velocity 2 = 59 ft/yr
Average Velocity = 68 ft/yr

Well Pair 624 and SBL 1

Groundwater Elevations: 6841.45 (Well 624) and 6844.76 (Well SBL 1) ft amsl
Separation Distance: 500 ft
Average Linear Horizontal Hydraulic Gradient: -0.007
~~*Velocity 1 = -63 ft/yr*~~
~~*Velocity 2 = -49 ft/yr*~~
~~*Average Velocity = -56 ft/yr*~~

Darcy seepage velocity calculation input values:
Mean hydraulic conductivity used = 2.5×10^{-3} cm/s (based on groundwater flow model calibration for the for the Southwest Alluvium (Chester Engineers, 2012g)).
Range of effective porosities = 27% (velocity 1) to 35% (velocity 2) (Canonie, 1989b; Earth Tech, 2002c).

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TABLE 6

Predicted Performance of Southwest Alluvium Natural Attenuation, 2019
United Nuclear Corporation, Church Rock Site
Church Rock, New Mexico

Constituent	Will Standards Be Met?			Remarks
	Section 2	Section 3	Section 10	
Manganese	No	Yes	No	Not regulated by NRC. Revised EPA standard lower than previous standard. Section 2 includes onsite seepage impact; Section 3 includes offsite seepage impact with Mn attenuated and known background water with Mn below EPA standard; Section 10 includes advancing front of seepage impact with Mn below EPA standard but Mn above EPA standard in background Well SBL 1 (see Table 2 and Table A.1 in Appendix A).
Sulfate	Yes	Yes	No	Not regulated by NRC. Current EPA standard higher than previous standard. Seepage impact area sulfate concentrations lower than revised EPA standard; Section 10 background waters typically characterized by exceedances unrelated to seepage impact; highest sulfate concentrations occur in background Well SBL 1 in Section 10 (see Figures 7, 9, and 16).
Chloride	No	Yes?	Yes	Not regulated by NRC. Section 2 includes onsite seepage impact with revised EPA standard exceedances at two locations in 2019 (Wells 509 D and 632). Section 3 includes offsite seepage impact with no exceedances in 2019 (GW 1 has had recent historical exceedances). Section 10 includes advancing front of seepage impact with no exceedances at background Well SBL 1.
TDS	Yes	Yes	Yes	Not regulated by NRC. Revised EPA standard higher than previous standard. Governed by sulfate concentration; highest TDS concentrations occur in background Well SBL 1 and, historically, in impacted Well GW 2* (see Figure 17).
Metals	Yes	Yes	No	Attenuation by neutralization and adsorption. Section 2 includes onsite seepage impact with no exceedances; Section 3 includes offsite seepage impact and known background water with no exceedances; Section 10 includes advancing front of seepage impact with no exceedances, but exceedances of NRC License standard for nickel in background Well SBL 1 continued during 2019 (see Table 2 and Appendix A, Table A-1).
Radionuclides	Yes	Yes?	Yes	Attenuation by neutralization and adsorption; historical uranium exceedances in GW 3* (Section 3, July 2012 and January 2013-July 2015) are associated with the smallest saturated thickness (July 2015 = 2.07 ft (4%)) in the Southwest Alluvium (GW 3 was projected to have had 0% saturated thickness in 2018 but is no longer accessible).
TTHMs	Yes	Yes	Yes	Attenuated by degradation, dilution, dispersion. No exceedances of NRC/EPA standard.

Notes:
NRC License GWPSs and EPA cleanup standards have been revised based on background statistical analysis (i.e., UPL95s).
* Wells GW 2 and GW 3 not sampled beginning October 2015; they are near the edge of the Pipeline Arroyo canyon and can no longer be safely accessed. GW 3 also no longer meets the low flow sampling specifications and cannot be sampled reliably.

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TABLE 7

Change in Zone 3 Saturated Thickness from 1989 to 2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Well Number[1]	Saturated Thickness		Change (feet)	Change
	3rd Quarter 1989	4th Quarter 2019		
402	--	6.33	--	--
420	56.3	0.00	-56.3	-100.00%
424	--	9.83	--	--
446[2]	--	10.03	--	--
504 B	40.1	0.00	-40.1	-100.00%
517	42.7	5.95	-36.7	-86.05%
613[3]	67.2	18.47	-48.7	-72.51%
EPA 09	8.1	2.75	-5.3	-66.00%
EPA 13	24.8	4.89	-19.9	-80.31%
EPA 14	76.3	17.58	-58.7	-76.96%
701	46.1	14.83	-31.3	-67.83%
702	24.1	7.08	-17.0	-70.62%
703	32.6	17.34	-15.3	-46.81%
705	--	--	--	--
706	--	12.79	--	--
707	58.8	6.92	-51.9	-88.23%
708	49.8	8.36	-41.4	-83.21%
709	56.1	8.25	-47.9	-85.30%
710	45.5	7.74	-37.8	-82.98%
711	43.7	15.06	-28.6	-65.54%
712	39.1	3.24	-35.9	-91.70%
713	34.2	6.54	-27.7	-80.88%
714[4]	50.1	9.48	-40.6	-81.09%
715[4]	47.6	5.38	-42.2	-88.70%
716[4]	58.3	11.24	-47.1	-80.73%
717[4]	57.6	12.94	-44.7	-77.53%
718[4]	51.1	10.41	-40.7	-79.63%
719[4]	39.9	3.95	-35.9	-90.09%
720[4]	33.1	0.00	-33.1	-100.00%
NBL-01[5]	--	dry	--	--
501 B[6]	20.2	--	--	--
411[6]	62.5	--	--	--
502 B[6]	48.5	--	--	--
518[6]	37.2	--	--	--
EPA 01[6]	14.7	--	--	--
EPA 03[6]	8.3	--	--	--
EPA 11[6]	30.8	--	--	--
EPA 12[6]	10.7	--	--	--
EPA 15[6]	60.8	--	--	--
EPA 17[6]	1.4	--	--	--
EPA 18[6]	2.5	--	--	--
Average	37.3	8.48	-36.9	-81%

Notes:

[1] Wells 9 D and 106 D were not included because they appear to be completed above the bottom of Zone 3. Measurements of saturated thickness in these wells may be less than actual conditions. Well 126 was not included because it was completed above the bottom of Zone 3. Measurements of saturated thickness in this well are less than actual conditions. Wells 600, 610 and 672 were not included because they were used solely as pumping wells, therefore no water level data are available. Well 608 was not included because no water level data were available in 1989 and the last water level measurement was in February 2000.

[2] Saturated thickness estimates based on Well 446 water level measurements are unreliable; the water level is likely below the bottom of the screened interval (within a section of blank casing) and it is difficult to measure due to the presence of a floating natural oil lens.

[3] Water level for Well 613 measured in 1983 before pumping started. Water level data for 1989 are not available because well was pumping.

[4] Water levels for the Stage II wells were measured June 1991 when wells were installed. Not included in 1989 average saturated thickness calculation.

[5] Well NBL-01 installed in July 2001 and first water level measured in August 2001.

[6] Wells are not currently monitored. See Table 9 for additional information regarding the status of each well.

Shading indicates saturated thickness greater than 25 feet.

"--" indicates that there is no data available.

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TABLE 8

Estimated Mass Removal by Extraction Well Pumping in Zone 3, November 30, 2018 Through December 2, 2019
United Nuclear Corporation, Church Rock Site
Church Rock, New Mexico

Well	Water Pumped (gallons)	SO4 (kg)	NO3 as N (kg)	Chloroform (g)	Al (kg)	As (g)	Be (g)	Co (g)	Pb (g)	Mn (kg)	Mo (g)	Ni (g)	U (g)	Total Radium (mci)	Pb-210 (mci)	Gross Alpha (mci)
RW-11	67,988	934	0.00	0.1	0.0	0.5	0.1	90.8	0.1	1.6	41.9	89.6	13.6	6.7	0.1	4.4
RW-16	55,257	962	0.05	0.1	49.1	1.5	34.7	205	3.3	3.1	0.1	224	149	5.0	0.4	4.4
RW-17	97,722	1,683	0.01	0.1	1.6	1.8	1.5	91.7	0.6	2.2	200	126	44.8	6.4	0.2	3.4
PB-2	0	0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RW-A	28,762	471	0.03	0.0	0.0	0.1	0.2	43.9	0.1	0.8	1.0	49.9	1.0	3.6	0.1	2.3
NW-1	0	0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NW-2	23,442	354	0.02	0.0	0.8	0.0	1.8	71.9	5.7	0.8	4.4	100	9.5	1.4	0.0	0.8
NW-3	0	0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NW-4	0	0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NW-5	92,612	1,399	0.09	0.0	3.1	0.2	7.0	284	22.4	3.0	17.5	396	37.5	5.6	0.2	3.0
Total	365,784	5,803	0.2	0.3	55	4.1	45	787	32	12	265	986	256	29	1.0	18

Notes:

Pumping data reported for 11/30/18 through 12/2/2019.

Wells are located on Figure 38 of the *2019 Annual Review Report*.

Well NW-02 was only pumped part of the year due to reduced well capacity

Wells RW-12, RW-13, and RW-15 were not pumped, because of negligible capacity.

Wells PB 2, NW 1, NW 3, and NW 4 were not pumped.

Units for radionuclides (mci) are not mass units proper; mci are milli-Curies, or thousandths of Curies.

In developing this table, masses were estimated from analyses of October 2019 samples from RW-11 and RW-A. Masses for RW-16 and RW-17 were estimated from Concentrations in samples from nearby wells 717 and 719. Masses in the NW-series wells were estimated from concentrations in the 2013 sample from PB-03.

Nonradiological nondetects were assigned values of one-half the reporting limit.

Radiological results were assigned as reported (even if negative).

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TABLE 9
Zone 3 Performance Monitoring Program, 2019 Operating Year
United Nuclear Corporation, Church Rock Site
Church Rock, New Mexico

Well	Water Level	Water Quality	NRC POC[1]	Purpose
Continue Monitoring				
420[3]	X	X		Postmining-pretailings background, track plume.
711	X	X	Y	Track saturation and plume, replace 502 B based on results of low flow purge testing performed in January 2000.
504 B[4]	X	X		Track saturation and plume, extensive data set.
517	X		Y	Track plume, extensive data set.
EPA 9	X			Extent of saturation, water quality not necessary.
EPA 13	X	X		Extent of saturation. Water quality added 2nd quarter 2001.
EPA 14	X	X		Postmining-pretailings background, track plume.
702	X			Water level only, track saturation.
710	X			Water level only.
712	X			Water level only.
713	X			Water level only.
714	X			Water level only.
613	X	X	Y	Extensive data set, track saturation and source.
701	X			Water level only (decommissioned pumper).
706	X			Water level only (decommissioned pumper).
707	X			Water level only (decommissioned pumper).
708	X	X	Y	Added to program 2nd quarter 2001.
717	X	X		Water level. Water quality added 2nd quarter 2001.
719	X	X		Water level. Water quality added 2nd quarter 2001.
Additional Wells, Not Included In Original Performance Monitoring Program				
402	X			Long-term water level for migration path.
424	X			Long-term water level for migration path.
446[5]	X			Long-term water level for migration path.
Total	22	9		

Eliminated From Monitoring				Reason For Elimination
9 D				Dry
106 D				Dry
411				Oil, cannot get water level or sample.
501 B			Y	Dry
EPA 1				Dry
EPA 3			Y	Dry
EPA 11				Unuseable since 1990 - water level below pump, pump cemented in well.
EPA 12				Dry
EPA 15				Dry
EPA 17				Dry
EPA 18				Dry
126				Dry
502 B				Failed low-flow test, use 711
518			Y	Failed low-flow test, use 517
608				Not needed (formerly water level only)
703				Not needed (formerly water level only)
715				Not needed (formerly water level only)
709				Not needed (decommissioned pumper)
716				Not needed (pumper)
718				Not needed (pumper)
720				Not needed (decommissioned pumper)

Notes:
1. NRC POC = Nuclear Regulatory Commission Point of Compliance well
2. Well NBL-01 was drilled and installed June 2001. Water level and water quality to track downgradient extent of seepage. Well NBL-01 is not a formal requirement of the performance monitoring program, but it was also monitored for both water level and water quality until it was dewatered in 2014. It has been dry since that time.
3. The water level in Well 420 is below the base of Zone 3 and the screened interval of the well.
4. Water levels in Well 504 B became too low to allow sampling and the well went dry in 2012.
5. Well 446 water level measurements in are no longer valid because the water level is below the bottom of the screened interval.

Original source: Earth Tech, December 2002, Table 3.2

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TABLE 10

Zone 3 Saturated Thickness, October 2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Well	Water Level Measurement Date	Zone 3 Unsaturated Thickness	Zone 3 Saturated Thickness	Zone 3 Percentage Saturated
0402	10/15/2019	56.67	6.33	10%
0420	10/4/2019	51.00	0.00	0%
0424	10/15/2019	63.17	9.83	13%
446[3]	10/15/2019	55.36	10.03	15%
0504 B	10/15/2019	--[1]	<1.73[1]	--[1]
0517	10/3/2019	56.05	5.95	10%
0613	10/1/2019	49.53	18.47	27%
0701	10/15/2019	49.17	14.83	23%
0702	10/15/2019	73.92	7.08	9%
0703	10/15/2019	74.66	17.34	19%
0706	10/15/2019	65.21	12.79	16%
0707	10/15/2019	81.08	6.92	8%
0708	10/1/2019	76.64	8.36	10%
0709	10/15/2019	68.75	8.25	11%
0710	10/15/2019	73.26	7.74	10%
0711	10/3/2019	69.94	15.06	18%
0712	10/15/2019	82.76	3.24	4%
0713	10/15/2019	66.46	6.54	9%
0714	10/15/2019	28.52	9.48	25%
0715	10/15/2019	29.62	5.38	15%
0716	10/15/2019	52.76	11.24	18%
0717	10/1/2019	58.06	12.94	18%
0718	10/15/2019	36.59	10.41	22%
0719	10/8/2019	41.05	3.95	9%
EPA 09	10/15/2019	47.25	2.75	6%
EPA 13	10/3/2019	59.11	4.89	8%
EPA 14	10/1/2019	55.42	17.58	24%
MW-2	10/15/2019	51.35	9.08	15%
MW-3	10/15/2019	55.13	5.79	10%
MW-4	--[4]	--	<2[1]	--
MW-5	--[4]	--	<2[1]	--
MW-6	10/14/2019	--[1]	--[1]	--[1]
MW-7	10/4/2019	46.48	7.99	15%
NBL-01	10/11//2018	--	--	--[2]
NBL-02	10/4/2019	65.28	12.29	16%
NW-1	10/21/2019	42.36	1.93	4%
NW-2	10/10/2019	45.17	5.95	12%
NW-3	10/4/2019	46.70	11.11	19%
NW-4	10/10/2019	44.83	5.53	11%
NW-5	10/10/2019	46.40	11.61	20%
PB-02	10/14/2019	--[1]	<2[1]	--[1]
PB-03	10/14/2019	--[1]	<2[1]	--[1]
PB-04	10/14/2019	36.62	0.38	1%
RW-11	10/8/2019	54.97	6.87	11%
RW-15	--[4]	--	--	--
RW-16	10/15/2019	52.08	11.02	17%
RW-17	10/15/2019	66.84	6.39	9%
RW-A	10/8/2019	59.61	8.26	12%
Z3 M-01	10/15/2019	43.09	0.09	0%
Z3 M-02	10/15/2019	43.88	2.41	5%
IW-A	10/14/2019	46.72	0.99	2%

[1] Dry well

[2] Obstructed well (i.e., water level dropped below sediment at well base)

[3] Well 446 water level is suspect and is likely below the bottom of the screened interval (within a section of blank casing). Actual local water level likely significantly lower. Measured value represents depth to floating lens of crude oil.

[4] Not Measured

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TABLE 11

Zone 3 Field Parameter Measurements of Tracking Wells Through October 2019
United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

	Bicarbonate (mg/L)							Conductivity (umhos/cm)							pH (s.u.)							Chloride (mg/L)						
Date	504 B	PB-2	PB-4	PB-3	NBL-1	NBL-2	RW-A	504 B	PB-2	PB-4	PB-3	NBL-1	NBL-2	RW-A	504 B	PB-2	PB-4	PB-3	NBL-1	NBL-2	RW-A	504 B	PB-2	PB-4	PB-3	NBL-1	NBL-2	RW-A
Oct-02	0	58	194	224	330	NA	NA	5,010	4,040	3,730	3,670	3,160	NA	NA	5.06	7.09	7.10	7.10	7.18	NA	NA	NA	25.3	23.8	113.0	NA	NA	NA
Nov-02	0	41	188	299	285	NA	NA	4,930	3,080	2,860	2,510	3,120	NA	NA	5.30	5.95	6.47	6.60	6.51	NA	NA	14.0	26.5	24.3	23.8	21.0	NA	NA
Dec-02	22.9	57	178	283	NA	NA	NA	5,040	4,120	3,950	3,330	NA	NA	NA	5.40	5.75	6.40	6.68	NA	NA	NA	22.9	26.2	23.2	25.7	NA	NA	NA
Jan-03	0	34	148	239	311	NA	NA	5,180	3,930	3,716	3,460	3,300	NA	NA	5.54	4.97	6.92	6.41	6.43	NA	NA	NA	NA	22.9	22.8	NA	NA	NA
Feb-03	0	58	193	324	328	NA	NA	3,620	2,910	2,660	2,570	2,300	NA	NA	3.52	5.57	6.96	6.92	6.53	NA	NA	26.7	30.1	30.4	28.5	21.5	NA	NA
Mar-03	NA	60	188	311	326	NA	NA	4,000	3,090	2,890	2,680	2,500	NA	NA	3.49	5.59	6.71	6.95	6.73	NA	NA	26.4	30.1	29.7	29.7	22.1	NA	NA
Apr-03	NA	34	172	310	321	NA	NA	4,210	4,460	4,220	3,820	2,650	NA	NA	5.14	5.46	5.94	6.26	6.87	NA	NA	26.6	30.5	30.0	30.1	21.6	NA	NA
May-03	0	34	167	293	322	NA	NA	5,510	4,460	4,210	3,820	3,390	NA	NA	5.01	5.36	5.99	6.31	6.37	NA	NA	28.0	31.0	30.2	31.9	32.7	NA	NA
Jun-03	0	21	129	267	316	NA	NA	5,470	4,480	4,060	3,820	3,380	NA	NA	4.28	5.15	6.17	6.20	6.36	NA	NA	27.7	30.8	29.6	30.6	28.0	NA	NA
Jul-03	NA	32	126	257	311	NA	NA	5,480	4,560	4,330	3,920	3,500	NA	NA	5.35	5.28	5.85	6.32	6.29	NA	NA	26.5	30.6	29.7	31.1	25.8	NA	NA
Aug-03	NA	5	100	234	307	NA	NA	5,210	4,280	3,960	3,630	3,230	NA	NA	5.14	5.18	5.76	6.18	6.28	NA	NA	27.0	30.4	29.7	31.1	23.1	NA	NA
Sep-03	NA	7	91	218	295	NA	NA	5,260	4,400	4,160	3,770	3,340	NA	NA	4.68	5.23	5.79	6.28	6.39	NA	NA	28.0	30.5	29.3	31.5	26.7	NA	NA
Oct-03	NA	0	65	211	295	NA	NA	5,360	4,450	4,210	3,860	3,410	NA	NA	5.48	5.18	5.81	6.34	6.41	NA	NA	27.7	21.0	30.0	32.7	26.8	NA	NA
Nov-03	NA	0	73	197	285	NA	NA	5,290	4,510	4,210	3,880	3,490	NA	NA	5.09	5.25	5.81	6.24	6.42	NA	NA	27.3	30.6	30.2	32.1	24.8	NA	NA
Dec-03	NA	NA	41	166	265	NA	NA	5,370	4,540	4,290	3,910	3,510	NA	NA	4.41	5.14	5.77	6.76	6.48	NA	NA	27.7	30.2	29.8	31.5	25.2	NA	NA
Jan-04	NA	NA	73	194	327	NA	NA	5,340	4,610	4,310	4,030	3,550	NA	NA	5.39	5.16	5.82	7.51	6.50	NA	NA	32.5	30.5	29.5	32.6	26.8	NA	NA
Feb-04	NA	NA	50	190	323	NA	NA	5,410	4,630	4,260	3,970	3,590	NA	NA	3.40	3.81	5.99	6.25	6.40	NA	NA	28.0	30.1	30.3	32.7	26.6	NA	NA
Mar-04	NA	15	48	179	316	NA	NA	5,560	4,730	4,500	4,130	3,780	NA	NA	3.89	4.75	5.70	6.31	6.29	NA	NA	27.5	30.1	30.2	33.3	25.9	NA	NA
Apr-04	NA	15	48	174	315	NA	NA	5,370	4,560	4,380	4,010	3,630	NA	NA	5.36	5.08	5.52	6.03	6.34	NA	NA	28.1	32.1	32.3	36.2	31.1	NA	NA
May-04	NA	0	27	166	312	NA	NA	6,190	4,390	4,160	3,870	3,510	NA	NA	3.26	5.02	5.34	5.88	6.23	NA	NA	28.4	33.2	32.8	38.1	31.9	NA	NA
Jun-04	NA	0	22	152	294	NA	NA	5,510	4,530	4,400	4,040	3,750	NA	NA	4.48	4.92	5.46	6.05	6.40	NA	NA	28.2	32.6	32.9	37.7	34.1	NA	NA
Jul-04	NA	0	20	140	274	NA	NA	5,450	4,510	4,420	4,000	3,740	NA	NA	5.48	5.04	5.58	6.05	6.45	NA	NA	27.8	31.9	32.8	36.9	34.1	NA	NA
Aug-04	NA	0	17	124	272	NA	NA	5,500	4,450	4,380	4,040	3,710	NA	NA	3.77	4.26	5.45	5.98	6.39	NA	NA	28.3	31.0	32.3	36.2	33.7	NA	NA
Sep-04	0	0	20	117	251	NA	NA	5,480	4,500	4,430	4,030	3,790	NA	NA	4.04	4.46	5.48	6.05	6.45	NA	NA	28.5	30.9	32.5	36.0	34.0	NA	NA
Oct-04	0	0	18	102	245	NA	NA	5,520	4,540	4,560	4,110	3,940	NA	NA	5.56	5.15	5.62	6.08	6.47	NA	NA	27.8	31.5	32.0	30.2	33.2	NA	NA
Nov-04	0	0	17	98	245	NA	NA	5,370	4,400	4,340	3,950	3,840	NA	NA	4.46	4.23	5.47	5.99	6.37	NA	NA	28.8	31.4	32.3	35.6	32.0	NA	NA
Dec-04	0	0	13	87	207	NA	NA	5,290	4,340	4,290	3,920	3,790	NA	NA	4.46	4.28	5.44	5.95	6.36	NA	NA	28.3	31.2	31.0	34.0	30.0	NA	NA
Jan-05	11	0	32	79	198	NA	NA	5,700	4,610	4,520	4,110	4,080	NA	NA	5.31	3.92	5.46	6.03	6.29	NA	NA	29.1	31.3	31.3	33.8	34.2	NA	NA
Feb-05	0	0	7	68	196	NA	NA	5,680	4,720	4,550	4,130	3,980	NA	NA	3.92	3.24	5.31	5.98	6.37	NA	NA	28.0	31.5	31.3	33.4	30.0	NA	NA
Mar-05	0	0	0	60	169	NA	NA	5,540	4,510	4,350	3,990	3,960	NA	NA	3.84	3.72	5.32	5.93	6.27	NA	NA	24.5	31.3	32.0	33.7	35.2	NA	NA
Apr-05	8	0	29	70	154	NA	NA	5,350	4,300	4,340	3,980	3,890	NA	NA	4.46	4.25	5.56	5.88	6.31	NA	NA	27.8	32.4	32.2	34.0	35.1	NA	NA
May-05	0	0	0	67	150	NA	NA	5,300	4,290	4,170	3,840	3,810	NA	NA	4.33	3.78	4.53	5.85	6.30	NA	NA	28.5	32.6	30.6	33.4	34.6	NA	NA
Jun-05	0	0	0	65	138	NA	NA	5,400	4,330	4,280	3,980	3,910	NA	NA	4.06	3.93	4.63	5.77	6.15	NA	NA	28.1	32.1	31.0	33.6	34.7	NA	NA
Jul-05	0	0	0	67	123	NA	NA	5,020	4,150	4,100	3,780	3,640	NA	NA	5.10	3.55	4.04	5.58	5.88	NA	NA	27.9	31.2	31.9	33.1	34.3	NA	NA
Aug-05	0	0	0	57	122	NA	NA	5,270	4,320	4,360	3,880	3,730	NA	NA	3.40	3.39	3.29	5.89	6.62	NA	NA	28.4	31.5	31.6	34.2	34.2	NA	NA
Sep-05	0	NA	0	54	111	NA	NA	5,430	NA	4,230	3,920	3,830	NA	NA	3.58	NA	4.15	5.80	6.24	NA	NA	28.4	NA	31.3	33.2	34.1	NA	NA
Oct-05	0	NA	0	51	107	NA	NA	5,630	NA	4,410	4,220	4,030	NA	NA	5.45	NA	4.99	6.00	6.26	NA	NA	28.3	NA	31.3	33.6	34.0	NA	NA
Nov-05	0	NA	5	48	96	NA	NA	5,550	NA	4,180	4,080	3,940	NA	NA	3.75	NA	5.45	5.76	6.25	NA	NA	28.7	NA	33.0	34.2	34.2	NA	NA
Dec-05	0	NA	22	44	77	NA	NA	5,670	NA	4,190	4,060	3,950	NA	NA	3.38	NA	5.92	5.97	6.43	NA	NA	33.3	NA	35.6	34.1	31.6	NA	NA
Jan-06	0	NA	28	89	128	NA	NA	5,720	NA	4,110	4,330	4,250	NA	NA	5.22	NA	6.30	6.36	6.47	NA	NA	29.4	NA	45.0	35.2	32.2	NA	NA
Feb-06	0	NA	101	117	126	NA	NA	5,670	NA	4,350	4,250	4,040	NA	NA	3.83	NA	6.19	6.14	6.38	NA	NA	27.5	NA	41.3	37.5	49.0	NA	NA
Mar-06	0	NA	190	133	132	NA	NA	5,850	NA	4,290	4,310	4,060	NA	NA	4.14	NA	6.19	6.18	6.18	NA	NA	27.6	NA	43.7	39.9	38.8	NA	NA
Apr-06	0	NA	244	139	119	NA	NA	5,710	NA	4,280	4,310	5,710	NA	NA	5.21	NA	6.24	6.17	6.10	NA	NA	28.9	NA	44.3	41.0	34.0	NA	NA
May-06	0	NA	246	138	112	NA	NA	5,740	NA	4,180	4,290	4,130	NA	NA	4.12	NA	6.16	6.02	6.01	NA	NA	28.3	NA	45.1	42.0	33.9	NA	NA
Jun-06	0	104	249	138	130	NA	NA	5,680	4,280	4,160	4,450	4,080	NA	NA	4.12	5.86	6.14	6.08	6.02	NA	NA	29.0	44.3	45.8	42.0	32.8	NA	NA
Jul-06	0	134	230	217	138	NA	NA	5,140	4,020	3,750	4,060	3,810	NA	NA	5.06	5.90	6.13	6.14	6.06	NA	NA	29.4	40.7	45.0	50.5	37.0	NA	NA
Aug-06	0	160	232	227	137	NA	NA	5,340	4,050	3,860	4,140	3,850	NA	NA	3.89	6.04	6.17	6.34	6.24	NA	NA	27.6	43.1	47.2	50.0	37.8	NA	NA
Sep-06	0	137	235	278	155	NA	NA	5,350	3,960	3,740	3,980	3,870	NA	NA	3.41	6.00	6.16	6.45	6.49	NA	NA	27.8	38.7	27.8	50.5	41.2	NA	NA
Oct-06	0	141	279	323	133	NA	NA	5,230	4,040	3,810	4,000	4,000	NA	NA	5.11	6.02	6.24	6.42	6.21	NA	NA	29.9	39.0	47.3	51.4	35.0	NA	NA
Nov-06	0	159	229	304	155	NA	NA	5,390	4,180	3,840	4,020	4,020	NA	NA	3.64	6.01	6.96	6.46	6.59	NA	NA	27.8	38.7	46.2	53.1	44.0	NA	NA
Dec-06	0	151	233	328	183	NA	NA	5,680	4,290	4,090	4,230	4,360	NA	NA	3.42	6.18	7.05	6.67	6.44	NA	NA	28.6	38.8	47.1	54.0	48.3	NA	NA
Jan-07	0	149	243	335	196	NA	NA	5,310	4,170	3,920	4,010	4,220	NA	NA	5.23	6.13	6.70	6.56	6.36	NA	NA	29.0	37.0	48.0	53.0	49.0	NA	NA
Feb-07	0	144	205	272	178	NA	NA	5,340	4,150	3,800	3,900	4,160	NA	NA	4.16	6.50	6.64	6.62	6.43	NA	NA	28.0	37.0	49.0	53.0	51.0	NA	NA
Mar-07	0	NA	258	310	210	NA	NA	5,500	NA	3,970	4,120	4,200	NA	NA	3.84	NA	6.99	6.92	6.56	NA	NA	29.0	NA	50.0	53.0	50.0	NA	NA
Apr-07	0	161	302	345	217	NA	NA	5,210	3,990	3,830	3,950	4,060	NA	NA	5.25	6.01	6.33	6.44	6.18	NA	NA	28.0	38.0	46.0	44.0	52.0	NA	NA
May-07	0	173	288	317	223	NA	NA	5,260	3,980	3,750	3,850	3,860	NA	NA	3.91	6.05	6.48	6.52	6.61	NA	NA	28.0	36.0	48.0	52.0	54.0	NA	NA
Jun-07	0	169	310	311	191	NA	NA	4,200	3,230	3,020	2,980	3,030	NA	NA	3.38	6.03	6.86	6.85	6.44	NA	NA	28.0	35.0	50.0	51.0	52.0	NA	NA
Jul-07	0	156	293	322	199	NA	NA	4,750	3,400	3,530	3,410	3,520	NA	NA	5.10	6.16	6.37	6.51	6.40	NA	NA	29.0	36.0	51.0	49.0	54.0	NA	NA
Aug-07	0	171	293	306	150	NA	NA	4,860	3,770	3,550	3,570	3,650	NA	NA	3.92	5.91	6.45	6.41	6.06	NA	NA	28.0	36.0	53.0	52.0	55.0	NA	NA
Sep-07	0	184	307	304	135	NA	NA	4,940	3,610	3,570	3,660	3,720	NA	NA	3.58	6.09	6.60	6.46	6.77	NA	NA	29.0	35.0	54.0	53.0	57.0	NA	NA
Oct-07	20	161	329	307	185	NA	NA	4,630	3,300	3,170	3,200	3,350	NA	NA	3.29	6.39	6.51	6.64	6.20	NA	NA	29.0	36.0	55.0	52.0	50.0	NA	NA
Nov-07	0	159	295	258	109	NA	NA	4,400	3,530	3,170	3,160	3,350	NA	NA	3.69	5.88	6.94	6.52	6.20	NA	NA	29	36	53	50	53	NA	NA
Dec-07	0	148	316	290	55	NA	NA	5,440	3,990	3,890	3,980	4,110	NA	NA	3.49	6.04	6.80	6.65	6.05	NA	NA	29	34	51	51	53	NA	NA
Jan-08	NA	NA	289	294	107	302	350	NA	NA	4,190	4,220	4,470	3,720	3,870	NA	NA	6.41	6.37	5.88	6.69	6.27	NA	NA	54	54	50	37	43
Feb-08	NA	NA	189	299	13	313	NA	NA	NA	3,900	4,050	4,280	3,710	NA	NA	NA	6.80	7.00	5.34	6.64	NA	NA	NA	57	49	53	36	NA
Mar-08	NA	143	139	323	0	312	602	NA	4,220	3,900	4,060	4,370	3,630	3,870	NA	6.20	6.45	6.82	5.16	6.92	6.30	NA	32	57	50	57	35	50
Apr-08	NA	116	156	362	96	306	NA	NA	3,800	3,590	3,680	3,840	3,260	NA	NA	5.86	6.18	6.58	5.83	6.51	NA	NA	32	58	50	49	36	NA
May-08	NA	NA	169	337	29	312	406	NA	NA	3,900	4,040	3,950	3,690	3,980	NA	NA	6.21	6.50	5.97	6.29	6.47	NA	NA	58	53	51	36	37
Jun-08	NA	0	293	287	133	302	453	NA	4,570	3,890	3,990	3,940	3,640	3,880	NA	3.84	6.40	6.53	6.12	6.26	6.15	NA	35	54	54	48	35	37
Jul-08	NA	0	268	302	162	313	228	NA	4,140	3,740	3,770	3,850	3,450	3,730	NA	5.94	6.39	7.28	6.33	6.54	6.38	NA	36	49	53	50	33	41
Aug-08	NA	99	201	289	208	316	349	NA	4,230	3,800	3,840	3,790	3,620	3,810	NA	5.83	6.42	6.88	6.46	6.50	6.35	NA	35	52	51	48	34	40
Sep-08	NA	106	211	290	244	310	327	NA	4,170	3,650	3,720	3,340	3,510	3,740	NA	5.86	6.89	7.18	7.09	6.39	6.32	NA	37	42	48	46	35	38

wood.

TABLE 11

Zone 3 Field Parameter Measurements of Tracking Wells Through October 2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

	Bicarbonate (mg/L)							Conductivity (umhos/cm)							pH (s.u.)							Chloride (mg/L)						
Date	504 B	PB-2	PB-4	PB-3	NBL-1	NBL-2	RW-A	504 B	PB-2	PB-4	PB-3	NBL-1	NBL-2	RW-A	504 B	PB-2	PB-4	PB-3	NBL-1	NBL-2	RW-A	504 B	PB-2	PB-4	PB-3	NBL-1	NBL-2	RW-A
Oct-08	NA	98	84	301	294	321	337	NA	4,080	4,000	3,770	3,820	3,560	3,760	NA	5.74	5.85	6.69	6.31	6.54	6.37	NA	30	50	55	48	38	38
Nov-08	NA	80	50	127	246	335	338	NA	4,120	3,570	3,900	3,730	3,560	3,750	NA	5.55	5.87	6.16	6.41	6.43	6.24	NA	32	53	57	46	34	35
Dec-08	NA	85	39	79	268	351	346	NA	3,990	3,500	4,040	3,660	3,530	3,700	NA	6.05	5.68	5.76	6.86	6.48	6.26	NA	34	52	57	44	36	38
Jan-09	NA	63	10	15	295	351	344	4950	4,190	3,690	4,100	3,860	3,580	3,800	5.5	5.41	4.02	5.41	6.24	6.55	6.25	NA	30	50	57	43	40	39
Apr-09	NA	55	0	174	271	338	385	5110	4,010	4,960	3,900	3,560	3,600	3,710	5.59	5.31	2.88	6.21	6.80	6.43	6.36	NA	29	42	53	40	38	38
Feb-09	NA	74	0	16	268	344	361	NA	4,200	4,220	3,910	3,420	3,580	3,730	NA	5.64	3.03	5.00	6.55	6.43	6.35	NA	29	51	58	43	39	40
Mar-09	NA	89	12	0	306	343	351	NA	4,170	3,430	3,850	3,750	3,580	3,750	NA	5.74	4.56	4.87	7.29	6.44	6.30	NA	31	39	58	40	38	37
May-09	NA	83	0	205	258	337	332	NA	4,250	4,980	3,800	3,600	3,530	3,820	NA	5.80	2.51	6.35	6.99	6.41	6.31	NA	28	51	50	44	36	36
Jun-09	NA	83	0	287	235	334	318	NA	4,010	4,410	3,520	3,400	3,410	3,660	NA	5.60	2.52	7.32	6.98	6.43	6.30	NA	29	51	48	44	39	37
Jul-09	NA	77	0	244	227	328	308	4670	4,030	4,540	3,680	3,370	3,470	3,660	3.56	5.70	2.50	6.45	7.16	7.91	6.30	NA	29	>40	48	50	40	38
Aug-09	NA	50	0	226	85	312	293	NA	4,440	5,200	3,760	3,640	3,490	3,860	NA	5.33	2.51	6.62	6.64	6.58	6.21	NA	29	40	48	51	41	37
Sep-09	NA	65	NA	51	59	306	277	NA	4,370	NA	3,570	3,720	3,390	3,910	NA	5.40	NA	9.18	6.60	6.44	6.30	NA	29	NA	49	59	43	37
Oct-09	NA	94	NA	111	178	335	280	4860	3,980	NA	3,530	3,960	3,360	3,470	5.5	5.60	NA	6.26	5.65	6.41	5.80	NA	28	NA	42	48	41	36
Nov-09	NA	96	0	87	198	252	294	NA	4,260	2,230	3,500	3,970	3,260	3,760	NA	5.80	3.83	7.04	6.10	6.65	6.40	NA	28	7	42	46	127	37
Dec-09	NA	76	0	47	44	280	283	NA	4,350	4,640	3,490	3,950	3,350	3,720	NA	6.10	2.90	7.14	6.93	7.15	6.38	NA	29	41	40	48	97	37
Jan-10	NA	87	0	38	80	302	299	5020	4,460	4,300	3,600	4,150	3,460	3,850	4.56	5.50	2.76	5.45	6.31	6.39	6.06	NA	29	35	40	46	79	37
Feb-10	NA	89	0	22	55	306	272	NA	4,400	4,610	3,440	3,990	3,450	3,810	NA	5.90	3.00	6.26	6.39	6.50	6.27	NA	29	30	36	47	74	37
Mar-10	NA	94	0	28	69	321	282	NA	4,340	4,690	3,440	4,130	3,520	3,800	NA	5.80	2.93	6.62	5.38	6.48	6.42	NA	29	31	37	43	56	37
Apr-10	NA	71	0	234	0	330	265	NA	4,680	4,410	3,490	4,000	3,500	4,080	NA	5.42	2.95	6.38	5.40	6.67	6.10	NA	29	33	34	43	50	38
May-10	NA	72	0	194	0	340	268	NA	4,730	5,030	3,800	4,220	3,860	4,050	NA	5.76	2.67	7.48	3.25	6.14	6.34	NA	29	33	33	43	45	38
Jun-10	NA	66	0	182	0	338	251	NA	4,430	4,930	3,400	4,300	3,460	3,740	NA	5.60	2.74	7.67	2.95	6.66	6.40	NA	29	30	33	43	44	36
Jul-10	NA	81	0	262	0	354	248	5460	4,480	4,670	3,290	3,930	3,260	3,790	3.13	5.78	2.62	7.13	4.46	6.45	6.34	NA	29	30	33	41	44	38
Aug-10	NA	39	0	222	0	358	250	NA	4,330	5,020	3,440	4,340	3,450	3,770	NA	5.25	2.69	7.54	3.01	6.61	6.30	NA	29	32	31	40	42	36
Sep-10	NA	85	0	239	0	332	241	NA	4,450	5,020	3,410	4,250	3,500	3,750	NA	5.76	2.71	7.25	3.01	6.61	6.24	NA	28	32	29	40	45	36
Oct-10	NA	78	0	232	4	354	243	4610	4,710	4,260	3,340	4,090	3,300	3,910	3.88	5.29	2.89	7.12	2.97	6.59	5.99	NA	28	32	29	37	45	36
Nov-10	NA	60	0	210	0	355	224	NA	4,680	4,980	3,610	3,860	3,690	3,790	NA	5.71	2.90	6.67	4.51	6.42	6.41	NA	28	30	27	37	43	38
Dec-10	NA	56	NA	235	20	365	227	NA	4,720	NA	3,610	3,800	3,530	4,020	NA	5.66	NA	7.32	4.70	6.78	6.14	NA	28	NA	29	37	48	34
Jan-11	NA	55	NA	239	103	407	260	NA	5,030	NA	3,540	4,170	3,450	3,990	NA	5.70	NA	7.70	7.04	7.40	7.36	NA	28	NA	31	37	50	38
Feb-11	NA	57	NA	234	16	390	246	NA	4,600	NA	3,510	3,750	3,530	3,850	NA	5.66	NA	7.35	4.94	6.91	6.30	NA	28	NA	26	36	45	35
Mar-11	NA	35	0	237	0	397	245	NA	4,680	5,220	3,430	3,790	3,520	3,860	NA	5.40	2.71	7.43	4.07	6.75	6.36	NA	28	28	27	36	48	36
Apr-11	NA	78	0	262	0	402	247	NA	4,720	5,390	3,490	4,060	3,490	3,940	NA	5.87	2.80	6.96	5.71	6.68	6.35	NA	30	28	29	36	50	37
May-11	NA	76	0	223	0	401	239	NA	4,110	5,390	3,470	3,830	3,550	3,920	NA	5.76	2.65	7.42	3.91	6.81	6.65	NA	30	NA	30	36	51	39
Jun-11	NA	67	0	223	0	412	241	NA	4,710	5,340	3,450	3,820	3,510	3,910	NA	5.52	2.59	7.61	3.74	6.87	6.36	NA	30	30	29	34	51	37
Jul-11	NA	65	0	272	0	405	248	NA	4,650	5,640	3,240	4,040	3,450	3,840	NA	5.48	2.70	7.28	5.47	6.51	7.12	NA	30	33	29	35	50	38
Aug-11	NA	294	0	235	0	405	243	NA	3,770	5,640	3,610	4,440	3,700	3,880	NA	6.42	2.70	7.74	3.17	6.78	6.43	NA	38	33	28	34	49	38
Sep-11	NA	85	0	267	0	400	243	NA	4,600	5,610	3,440	4,380	3,530	3,830	NA	5.87	2.51	6.52	2.83	6.58	6.41	NA	30	33	28	37	50	38
Oct-11	NA	79	0	251	0	414	244	NA	4,580	5,540	3,380	4,200	3,490	3,830	NA	5.73	2.56	7.35	2.88	6.80	6.40	NA	30	32	28	36	51	37
Nov-11	NA	88	0	236	0	406	245	NA	4790	5700	3530	4590	3600	3980	NA	5.9	2.49	6.68	2.86	6.75	6.46	NA	29	32	29	32	51	37
Dec-11	NA	77	0	234	0	408	243	NA	4800	5640	3560	4730	3640	3960	NA	6.06	2.67	6.62	2.99	6.78	6.42	NA	30	32	28	32	52	37
Jan-12	NA	63	NA	217	0	405	224	NA	4790	NA	3650	4680	3540	3940	NA	5.74	NA	6.57	2.91	6.76	6.39	NA	30	NA	29	40	52	37
Feb-12	NA	79	0	213	0	406	234	NA	4720	5580	3570	4800	3640	3980	NA	5.83	2.68	6.83	2.84	6.84	6.3	NA	29	33	28	33	52	37
Mar-12	NA	83	0	230	0	391	224	NA	4690	5300	3600	4830	3660	4010	NA	5.9	2.66	6.63	2.82	6.74	6.39	NA	29	33	28	34	50	37
Apr-12	NA	77	0	221	0	373	223	NA	4680	5420	3560	4810	3520	3990	NA	5.8	2.65	6.38	2.81	6.67	6.28	NA	30	33	28	34	50	36
May-12	NA	90	0	219	0	376	228	NA	4690	5420	3500	5350	3550	3980	NA	5.97	2.46	6.50	2.59	6.6	6.37	NA	30	34	27	35	50	36
Jun-12	NA	69	0	223	0	377	226	NA	4600	5830	3450	5420	3520	3900	NA	5.85	2.73	6.60	2.67	6.68	6.24	NA	29	33	27	32	48	37
Jul-12	NA	77	0	213	0	377	226	NA	4610	5630	3560	5130	3480	3950	NA	5.85	2.68	6.41	3.04	6.54	6.36	NA	30	31	27	31	47	35
Aug-12	NA	86	0	207	0	363	221	NA	4530	5580	3640	5550	3540	3890	NA	5.85	2.58	6.56	2.55	6.63	6.32	NA	30	31	27	31	47	35
Sep-12	NA	66	0	184	0	385	222	NA	4460	5660	3600	5150	3490	3870	NA	5.83	2.52	6.58	2.48	6.62	6.46	NA	30	32	27	31	49	36
Oct-12	NA	63	0	219	0	386	224	NA	4500	6080	3630	5110	3230	3930	NA	5.90	2.55	6.38	2.73	6.75	6.46	NA	30	33	27	31	49	35
Nov-12	NA	87	0	189	0	399	220	NA	4470	6320	3710	5600	3460	3910	NA	6.00	2.64	6.95	2.65	6.75	6.41	NA	30	32	28	30	49	37
Dec-12	NA	82	0	190	0	391	212	NA	4450	6390	3630	5500	3480	3900	NA	5.89	2.50	7.10	2.59	6.75	6.36	NA	29	31	27	31	50	35
Jan-13	NA	73	0	182	0	386	215	NA	4720	7120	4240	5850	3850	4130	NA	5.84	2.48	6.47	2.65	6.84	6.44	NA	30	31	27	32	50	35
Feb-13	NA	80	0	96	0	397	226	NA	4780	6400	3850	5730	3630	4160	NA	5.85	2.43	6.88	2.56	6.64	6.36	NA	29	32	27	33	49	36
Mar-13	NA	76	0	45	NA	379	212	NA	3580	6200	3950	NA	3580	4180	NA	5.70	2.53	6.14	NA	6.69	6.40	NA	29	32	27	NA	50	36
Apr-13	NA	62	0	0	NA	379	210	NA	4540	5950	4440	NA	3540	4010	NA	5.84	2.53	3.72	NA	6.62	6.38	NA	30	32	27	NA	50	36
May-13	NA	54	0	0	NA	384	183	NA	4510	6220	4140	NA	3410	4000	NA	5.72	2.64	3.42	NA	6.82	6.29	NA	30	33	28	NA	51	36
Jun-13	NA	54	0	0	NA	379	185	NA	4580	6040	4310	NA	3420	4120	NA	5.48	2.49	3.00	NA	6.54	6.12	NA	30	33	28	NA	50	34
Jul-13	NA	58	0	0	NA	376	184	NA	4430	5870	4380	NA	3470	4020	NA	5.71	2.54	2.97	NA	6.65	6.29	NA	31	33	27	NA	50	33
Aug-13	NA	35	0	0	NA	365	184	NA	4290	5630	4260	NA	3340	3980	NA	6.08	2.46	2.88	NA	7.03	6.42	NA	31	34	28	NA	50	34
Sep-13	NA	NA	0	0	NA	379	191	NA	NA	5780	4800	NA	3540	3930	NA	NA	2.47	2.65	NA	6.59	6.58	NA	NA	34	32	NA	50	34
Oct-13	NA	NA	0	0	NA	391	199	NA	NA	5540	5230	NA	3620	3950	NA	NA	2.85	2.82	NA	7.26	6.53	NA	NA	34	32	NA	50	34
Nov-13	NA	NA	0	0	NA	385	191	NA	NA	5240	4910	NA	3340	4090	NA	NA	3.07	2.80	NA	6.89	6.35	NA	NA	34	28	NA	49	33
Dec-13	NA	NA	0	0	NA	384	183	NA	NA	5080	4710	NA	3330	4070	NA	NA	2.80	2.77	NA	7.38	6.29	NA	NA	34	28	NA	49	34
Jan-14	NA	NA	0	0	NA	383	198	NA	NA	5450	5100	NA	3430	3870	NA	NA	2.80	2.83	NA	6.73	6.36	NA	NA	32	28	NA	49	34
Feb-14	NA	NA	0	0	NA	367	166	NA	NA	5260	5330	NA	3410	4070	NA	NA	2.76	2.70	NA	6.92	6.40	NA	NA	32	29	NA	54	34
Mar-14	NA	NA	0	0	NA	384	182	NA	NA	5060	5000	NA	3410	3950	NA	NA	2.89	2.69	NA	6.98	6.24	NA	NA	32	29	NA	47	33
Apr-14	NA	NA	0	0	NA	376	179	NA	NA	4680	4960	NA	3200	3990	NA	NA	2.98	2.83	NA	6.75	6.10	NA	NA	32	31	NA	47	33
May-14	NA	NA	0	0	NA	371	114	NA	NA	4620	4740	NA	3240	4040	NA	NA	2.89	2.81	NA	6.68	6.30	NA	NA	32	35	NA	45	32
Jun-14	NA	NA	0	11	NA	369	170	NA	NA	4600	3930	NA	3170	3910	NA	NA	2.98	5.79	NA	6.67	6.40	NA	NA	32	30	NA	44	33
Jul-14	NA	NA	0	0	NA	364	157	NA	NA	4670	4430	NA	3400	4210	NA	NA	2.95	3.61	NA	6.73	6.14	NA	NA	34	28	NA	45	34
Aug-14	NA	NA	0	0	NA	366	168	NA	NA	5000	4550	NA	3390	4240	NA	NA	2.94	3.32	NA	6.64	6.18	NA	NA	32	27	NA	45	34
Sep-14	NA	NA	0	0	NA	356	166	NA	NA	4940	4340	NA	3350	4120	NA	NA	2.97	3.55	NA	6.60	6.19	NA	NA	33	27	NA	45	32

wood.

TABLE 11

Zone 3 Field Parameter Measurements of Tracking Wells Through October 2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

	Bicarbonate (mg/L)							Conductivity (umhos/cm)							pH (s.u.)							Chloride (mg/L)						
Date	504 B	PB-2	PB-4	PB-3	NBL-1	NBL-2	RW-A	504 B	PB-2	PB-4	PB-3	NBL-1	NBL-2	RW-A	504 B	PB-2	PB-4	PB-3	NBL-1	NBL-2	RW-A	504 B	PB-2	PB-4	PB-3	NBL-1	NBL-2	RW-A
Oct-14	NA	NA	0	0	NA	357	162	NA	NA	4870	4040	NA	3300	3650	NA	NA	2.98	3.96	NA	6.62	6.09	NA	NA	33	27	NA	42	33
Nov-14	NA	NA	0	11	NA	335	153	NA	NA	4670	3760	NA	3360	4230	NA	NA	2.97	4.66	NA	6.73	6.40	NA	NA	34	25	NA	43	32
Dec-14	NA	NA	0	9	NA	336	123	NA	NA	4850	3520	NA	3440	4110	NA	NA	3.01	5.00	NA	6.56	6.26	NA	NA	34	24	NA	40	31
Jan-15	NA	NA	0	12	NA	326	151	NA	NA	4960	3900	NA	3420	4160	NA	NA	2.87	5.75	NA	6.67	6.36	NA	NA	31	26	NA	40	31
Feb-15	NA	NA	0	11	NA	329	141	NA	NA	4670	3110	NA	3280	4170	NA	NA	2.88	6.14	NA	6.26	6.32	NA	NA	33	22	NA	40	34
Mar-15	NA	NA	0	25	NA	323	149	NA	NA	4440	3690	NA	3240	4070	NA	NA	2.98	6.69	NA	6.74	6.09	NA	NA	33	26	NA	40	32
Apr-15	NA	NA	0	33	NA	322	140	NA	NA	4830	4080	NA	3750	4460	NA	NA	2.97	6.18	NA	6.48	6.08	NA	NA	32	25	NA	40	32
May-15	NA	NA	0	67	NA	336	137	NA	NA	4820	3970	NA	3320	4420	NA	NA	3.01	6.85	NA	6.51	6.08	NA	NA	33	26	NA	39	31
Jun-15	NA	NA	0	54	NA	348	136	NA	NA	4890	4180	NA	3320	4470	NA	NA	3.01	6.30	NA	6.43	6.19	NA	NA	30	26	NA	39	32
Jul-15	NA	NA	0	69	NA	349	145	NA	NA	4810	3920	NA	3140	4330	NA	NA	2.91	6.95	NA	6.69	6.03	NA	NA	33	28	NA	38	32
Aug-15	NA	NA	0	57	NA	334	129	NA	NA	4740	4040	NA	3250	4460	NA	NA	3.14	6.86	NA	6.74	6.12	NA	NA	31	29	NA	37	31
Sep-15	NA	NA	0	45	NA	244	112	NA	NA	4770	3910	NA	3170	4450	NA	NA	2.95	6.97	NA	6.62	6.08	NA	NA	30	30	NA	36	31
Oct-15	NA	NA	NA	NA	NA	358	124	NA	NA	NA	NA	NA	3270	4380	NA	NA	NA	NA	NA	6.39	6.40	NA	NA	NA	NA	NA	36	31
Nov-15	NA	NA	NA	NA	NA	351	119	NA	NA	NA	NA	NA	3200	4510	NA	NA	NA	NA	NA	6.74	6.02	NA	NA	NA	NA	NA	36	31
Dec-15	NA	NA	NA	NA	NA	323	106	NA	NA	NA	NA	NA	3170	4490	NA	NA	NA	NA	NA	6.87	6.27	NA	NA	NA	NA	NA	38	31
Jan-16	NA	NA	NA	NA	NA	326	115	NA	NA	NA	NA	NA	3320	4470	NA	NA	NA	NA	NA	6.61	6.29	NA	NA	NA	NA	NA	38	31
Feb-16	NA	NA	NA	NA	NA	316	105	NA	NA	NA	NA	NA	3400	4590	NA	NA	NA	NA	NA	6.81	6.01	NA	NA	NA	NA	NA	38	31
Mar-16	NA	NA	NA	NA	NA	342	106	NA	NA	NA	NA	NA	3390	4740	NA	NA	NA	NA	NA	6.96	6.15	NA	NA	NA	NA	NA	38	31
Apr-16	NA	NA	NA	NA	NA	345	110	NA	NA	NA	NA	NA	3180	4670	NA	NA	NA	NA	NA	6.88	6.06	NA	NA	NA	NA	NA	38	31
May-16	NA	NA	NA	NA	NA	349	107	NA	NA	NA	NA	NA	3180	4770	NA	NA	NA	NA	NA	6.68	6.10	NA	NA	NA	NA	NA	38	31
Jun-16	NA	NA	NA	NA	NA	322	101	NA	NA	NA	NA	NA	3310	4840	NA	NA	NA	NA	NA	7.34	6.05	NA	NA	NA	NA	NA	36	29
Jul-16	NA	NA	NA	NA	NA	319	101	NA	NA	NA	NA	NA	3350	4820	NA	NA	NA	NA	NA	6.90	6.10	NA	NA	NA	NA	NA	37	28
Aug-16	NA	NA	NA	NA	NA	322	101	NA	NA	NA	NA	NA	3270	4600	NA	NA	NA	NA	NA	6.99	6.05	NA	NA	NA	NA	NA	35	29
Sep-16	NA	NA	NA	NA	NA	324	99	NA	NA	NA	NA	NA	3340	4690	NA	NA	NA	NA	NA	6.94	6.00	NA	NA	NA	NA	NA	38	29
Oct-16	NA	NA	NA	NA	NA	317	77	NA	NA	NA	NA	NA	3230	4590	NA	NA	NA	NA	NA	6.57	6.05	NA	NA	NA	NA	NA	39	29
Nov-16	NA	NA	NA	NA	NA	315	84	NA	NA	NA	NA	NA	3300	4850	NA	NA	NA	NA	NA	6.84	6.09	NA	NA	NA	NA	NA	39	31
Dec-16	NA	NA	NA	NA	NA	299	76	NA	NA	NA	NA	NA	3230	4840	NA	NA	NA	NA	NA	6.61	6.00	NA	NA	NA	NA	NA	40	31
Jan-17	NA	NA	NA	NA	NA	329	80	NA	NA	NA	NA	NA	3460	4,810	NA	NA	NA	NA	NA	6.66	5.87	NA	NA	NA	NA	NA	40	30
Feb-17	NA	NA	NA	NA	NA	311	85	NA	NA	NA	NA	NA	3350	4830	NA	NA	NA	NA	NA	6.63	6.03	NA	NA	NA	NA	NA	40	29
Mar-17	NA	NA	NA	NA	NA	NS	82	NA	NA	NA	NA	NA	NS	4900	NA	NA	NA	NA	NA	NS	5.89	NA	NA	NA	NA	NA	NS	29
Apr-17	NA	NA	NA	NA	NA	324	80	NA	NA	NA	NA	NA	3340	5000	NA	NA	NA	NA	NA	6.37	5.45	NA	NA	NA	NA	NA	41	30
May-17	NA	NA	NA	NA	NA	296	75	NA	NA	NA	NA	NA	3540	5030	NA	NA	NA	NA	NA	6.58	5.81	NA	NA	NA	NA	NA	46	29
Jun-17	NA	NA	NA	NA	NA	300	55	NA	NA	NA	NA	NA	3540	4980	NA	NA	NA	NA	NA	6.57	5.78	NA	NA	NA	NA	NA	41	29
Jul-17	NA	NA	NA	NA	NA	276	42	NA	NA	NA	NA	NA	3410	4930	NA	NA	NA	NA	NA	6.55	5.42	NA	NA	NA	NA	NA	41	29
Aug-17	NA	NA	NA	NA	NA	324	53	NA	NA	NA	NA	NA	3480	4950	NA	NA	NA	NA	NA	7.47	5.76	NA	NA	NA	NA	NA	41	29
Sep-17	NA	NA	NA	NA	NA	311	61	NA	NA	NA	NA	NA	3100	4950	NA	NA	NA	NA	NA	6.63	5.79	NA	NA	NA	NA	NA	42	29
Oct-17	NA	NA	NA	NA	NA	305	57	NA	NA	NA	NA	NA	3370	5120	NA	NA	NA	NA	NA	6.44	5.68	NA	NA	NA	NA	NA	43	30
Nov-17	NA	NA	NA	NA	NA	297	48	NA	NA	NA	NA	NA	3320	5020	NA	NA	NA	NA	NA	6.58	5.79	NA	NA	NA	NA	NA	42	30
Dec-17	NA	NA	NA	NA	NA	297	49	NA	NA	NA	NA	NA	3430	5060	NA	NA	NA	NA	NA	6.83	5.87	NA	NA	NA	NA	NA	41	30
Jan-18	NA	NA	NA	NA	NA	282	56	NA	NA	NA	NA	NA	3420	5100	NA	NA	NA	NA	NA	6.68	5.58	NA	NA	NA	NA	NA	40	30
Feb-18	NA	NA	NA	NA	NA	336	NA	NA	NA	NA	NA	NA	3420	NA	NA	NA	NA	NA	NA	6.76	NA	NA	NA	NA	NA	NA	40	NA
Mar-18	NA	NA	NA	NA	NA	295	54	NA	NA	NA	NA	NA	3300	5050	NA	NA	NA	NA	NA	6.86	5.85	NA	NA	NA	NA	NA	40	30
Apr-18	NA	NA	NA	NA	NA	307	46	NA	NA	NA	NA	NA	3230	4910	NA	NA	NA	NA	NA	6.60	5.69	NA	NA	NA	NA	NA	41	30
May-18	NA	NA	NA	NA	NA	311	57	NA	NA	NA	NA	NA	3430	5060	NA	NA	NA	NA	NA	6.57	5.77	NA	NA	NA	NA	NA	41	30
Jun-18	NA	NA	NA	NA	NA	307	43	NA	NA	NA	NA	NA	3160	4980	NA	NA	NA	NA	NA	7.09	5.80	NA	NA	NA	NA	NA	41	29
Jul-18	NA	NA	NA	NA	NA	299	30	NA	NA	NA	NA	NA	3300	4800	NA	NA	NA	NA	NA	7.02	5.46	NA	NA	NA	NA	NA	42	29
Aug-18	NA	NA	NA	NA	NA	280	45	NA	NA	NA	NA	NA	3280	5060	NA	NA	NA	NA	NA	7.44	5.70	NA	NA	NA	NA	NA	39	28
Sep-18	NA	NA	NA	NA	NA	307	42	NA	NA	NA	NA	NA	3170	5030	NA	NA	NA	NA	NA	7.12	5.80	NA	NA	NA	NA	NA	39	28
Oct-18	NA	NA	NA	NA	NA	299	42	NA	NA	NA	NA	NA	3470	5230	NA	NA	NA	NA	NA	6.59	5.47	NA	NA	NA	NA	NA	40	28
Nov-18	NA	NA	NA	NA	NA	293	30	NA	NA	NA	NA	NA	3,280	5,210	NA	NA	NA	NA	NA	7.27	5.70	NA	NA	NA	NA	NA	38	28
Dec-18	NA	NA	NA	NA	NA	287	36	NA	NA	NA	NA	NA	3,330	5,160	NA	NA	NA	NA	NA	7.54	5.58	NA	NA	NA	NA	NA	39	29
Jan-19	NA	NA	NA	NA	NA	295	30	NA	NA	NA	NA	NA	3,440	5,180	NA	NA	NA	NA	NA	7.04	5.54	NA	NA	NA	NA	NA	39	29
Feb-19	NA	NA	NA	NA	NA	274	29	NA	NA	NA	NA	NA	3,330	5,150	NA	NA	NA	NA	NA	7.11	5.58	NA	NA	NA	NA	NA	40	29
Mar-19	NA	NA	NA	NA	NA	268	24	NA	NA	NA	NA	NA	3,180	5,210	NA	NA	NA	NA	NA	7.77	5.65	NA	NA	NA	NA	NA	40	28
Apr-19	NA	NA	NA	NA	NA	293	32	NA	NA	NA	NA	NA	3,440	4,860	NA	NA	NA	NA	NA	6.76	5.60	NA	NA	NA	NA	NA	40	28
May-19	NA	NA	NA	NA	NA	297	30	NA	NA	NA	NA	NA	3,340	5,170	NA	NA	NA	NA	NA	7.08	5.64	NA	NA	NA	NA	NA	39	29
Jun-19	NA	NA	NA	NA	NA	318	34	NA	NA	NA	NA	NA	3,360	5,220	NA	NA	NA	NA	NA	7.46	5.67	NA	NA	NA	NA	NA	39	30
Jul-19	NA	NA	NA	NA	NA	280	24	NA	NA	NA	NA	NA	3,310	5,090	NA	NA	NA	NA	NA	6.88	5.48	NA	NA	NA	NA	NA	40	31
Aug-19	NA	NA	NA	NA	NA	293	33	NA	NA	NA	NA	NA	3,280	5,300	NA	NA	NA	NA	NA	7.50	5.65	NA	NA	NA	NA	NA	40	31
Sep-19	NA	NA	NA	NA	NA	287	34	NA	NA	NA	NA	NA	3,530	4,970	NA	NA	NA	NA	NA	7.35	5.72	NA	NA	NA	NA	NA	40	31
Oct-19	NA	NA	NA	NA	NA	283	12	NA	NA	NA	NA	NA	3,180	5,130	NA	NA	NA	NA	NA	6.65	6.25	NA	NA	NA	NA	NA	40	31

Notes:

Parameter monitoring of wells NBL-2 and RW-A started in January 2008.

NA indicates that data are not available because a sample was not or could not be collected.

NBL-1 "insufficient water volume" for sampling starting in March 2013 due to obstruction (mud).

Well 0504 B and PB-series wells are dry or have insufficient volume to collect sample as shown.

No sample 3/23/17 in NBL-2 due to pump failure.

No sample 2/27/18 in RW-A due to pump failure.

July 2019 sample for RW A was collected August 2, 2019.

The NBL-2 pH appears to be varying more widely in 2019 (like MW-7) than what typically occurred in previous years.

wood.

TABLE 12

Zone 3 Field Parameter Measurements of NW and MW-Series Wells Through October 2019
United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

	Bicarbonate (mg/L)							Conductivity (umhos/cm)							pH (s.u.)							Chloride (mg/L)						
Date	NW-1	NW-2	NW-3	NW-4	NW-5	MW-6	MW-7	NW-1	NW-2	NW-3	NW-4	NW-5	MW-6	MW-7	NW-1	NW-2	NW-3	NW-4	NW-5	MW-6	MW-7	NW-1	NW-2	NW-3	NW-4	NW-5	MW-6	MW-7
Jun-09	137	351	484	196	502	NA	NA	4,170	3,640	3,350	4,270	3,450	NA	NA	5.93	6.27	6.52	6.15	6.52	NA	NA	26	39	40	31	45	NA	NA
Jul-09	127	333	483	212	577	NA	NA	4,270	3,660	3,380	4,400	3,440	NA	NA	6.25	6.15	6.40	6.64	6.30	NA	NA	27	39	37	32	45	NA	NA
Aug-09	106	319	458	220	563	NA	NA	4,460	3,820	3,530	4,460	3,670	NA	NA	5.91	6.16	6.40	6.30	6.51	NA	NA	26	37	36	33	46	NA	NA
Sep-09	112	328	457	232	511	NA	NA	4,420	3,850	3,570	4,530	3,650	NA	NA	6.00	6.35	6.51	6.55	6.88	NA	NA	26	37	37	32	46	NA	NA
Oct-09	146	341	490	243	597	NA	NA	4,060	3,480	3,250	4,080	3,340	NA	NA	7.01	6.73	6.91	6.59	7.15	NA	NA	25	36	36	29	48	NA	NA
Nov-09	117	380	475	154	604	NA	NA	4,330	3,670	3,390	4,270	3,560	NA	NA	6.50	6.34	6.70	5.96	6.70	NA	NA	27	39	38	30	52	NA	NA
Dec-09	124	402	502	167	612	NA	NA	4,320	3,560	3,520	4,260	3,600	NA	NA	6.11	6.38	6.52	6.13	6.89	NA	NA	26	41	39	30	52	NA	NA
Jan-10	123	432	524	167	591	NA	NA	4,310	3,820	3,680	4,230	3,680	NA	NA	6.68	6.26	6.33	6.10	6.35	NA	NA	26	43	41	29	53	NA	NA
Feb-10	119	428	554	173	590	NA	NA	4,280	3,620	3,630	4,150	3,400	NA	NA	6.57	6.47	6.55	6.28	6.76	NA	NA	26	45	45	29	53	NA	NA
Mar-10	127	415	546	192	595	NA	NA	4,260	3,540	3,650	4,080	3,640	NA	NA	6.90	6.52	6.88	6.36	6.97	NA	NA	26	43	46	29	54	NA	NA
Apr-10	123	404	569	173	589	NA	NA	4,560	3,930	3,950	4,260	3,960	NA	NA	5.72	5.96	6.22	5.76	6.32	NA	NA	26	42	47	30	50	NA	NA
May-10	128	400	573	174	597	NA	NA	4,520	3,890	4,210	4,440	3,830	NA	NA	6.16	6.33	6.61	6.09	6.88	NA	NA	26	42	49	29	54	NA	NA
Jun-10	126	395	606	168	584	NA	NA	4,210	3,540	3,720	4,020	3,540	NA	NA	6.11	6.36	6.63	6.09	6.86	NA	NA	26	43	50	30	53	NA	NA
Jul-10	160	389	561	168	590	NA	NA	4,200	3,630	3,690	4,030	3,590	NA	NA	6.12	6.46	6.69	6.17	6.71	NA	NA	26	43	49	30	53	NA	NA
Aug-10	121	402	563	172	501	NA	NA	4,190	3,530	3,680	3,990	3,490	NA	NA	6.13	6.50	6.63	6.11	6.19	NA	NA	26	42	49	30	47	NA	NA
Sep-10	129	401	533	177	597	NA	NA	4,160	3,500	3,680	3,970	3,560	NA	NA	6.10	6.42	6.60	6.05	6.52	NA	NA	25	40	47	28	53	NA	NA
Oct-10	134	399	508	163	585	NA	NA	4,190	3,540	3,690	4,040	3,630	NA	NA	6.17	6.50	6.49	6.12	6.84	NA	NA	25	41	44	28	53	NA	NA
Nov-10	132	390	488	155	567	NA	NA	4,220	3,600	3,680	4,080	3,650	NA	NA	5.94	6.31	6.56	5.92	6.62	NA	NA	24	41	44	28	52	NA	NA
Dec-10	138	390	490	175	563	NA	NA	4,340	3,650	3,860	4,120	3,760	NA	NA	6.30	6.43	6.68	6.05	6.85	NA	NA	24	40	45	27	51	NA	NA
Jan-11	141	395	511	169	610	NA	NA	4,350	3,750	3,860	4,210	3,690	NA	NA	6.49	6.65	6.83	6.20	7.10	NA	NA	25	39	46	27	51	NA	NA
Feb-11	151	391	490	171	622	NA	NA	4,180	3,630	3,750	4,090	3,640	NA	NA	6.37	6.52	6.69	6.19	6.94	NA	NA	25	40	45	28	51	NA	NA
Mar-11	150	409	489	171	627	NA	NA	4,200	3,620	3,770	4,070	3,670	NA	NA	6.70	6.57	6.77	6.26	6.90	NA	NA	25	41	47	28	52	NA	NA
Apr-11	155	395	489	168	557	NA	NA	4,280	3,700	3,820	4,190	3,620	NA	NA	6.36	6.52	6.85	6.20	6.91	NA	NA	25	43	48	30	51	NA	NA
May-11	133	377	465	173	549	NA	NA	4,330	3,730	3,800	4,200	3,650	NA	NA	6.18	6.50	6.81	6.27	6.83	NA	NA	26	43	49	30	50	NA	NA
Jun-11	135	399	468	158	545	NA	NA	4,280	3,700	3,790	4,170	3,640	NA	NA	6.17	6.35	6.75	6.01	6.91	NA	NA	26	43	48	29	49	NA	NA
Jul-11	140	398	445	162	544	NA	NA	4,160	3,670	3,780	4,120	3,600	NA	NA	6.64	6.84	6.50	6.81	6.89	NA	NA	26	42	50	29	50	NA	NA
Aug-11	141	393	435	162	582	234	496	4,130	3,590	3,530	4,050	3,520	4,100	3,850	6.58	6.56	6.80	6.21	7.05	6.91	6.73	26	42	48	29	50	34	50
Sep-11	145	367	437	139	583	215	486	4,120	3,630	3,630	3,950	3,480	3,880	3,580	6.59	6.65	6.94	6.14	7.10	6.22	6.58	28	43	46	30	50	31	49
Oct-11	266	368	399	163	591	189	490	3,880	3,630	3,620	4,090	3,540	3,910	3,510	6.60	6.53	6.98	6.30	7.00	6.71	6.77	35	42	46	28	52	31	50
Nov-11	157	379	417	170	583	240	506	4,260	3,750	3,800	4,330	3,620	3,930	3,680	6.49	6.65	6.95	6.49	7.00	6.45	6.98	25	43	46	29	52	34	49
Dec-11	155	362	423	163	569	234	468	4,410	3,840	3,830	4,320	3,720	3,910	3,710	6.74	6.79	6.75	6.41	7.18	6.62	6.83	26	42	44	29	53	34	51
Jan-12	123	347	401	151	491	224	451	4,300	3,760	3,760	4,380	3,370	4,040	3,850	6.61	6.55	6.77	6.28	6.94	6.59	6.75	26	42	42	29	48	38	50
Feb-12	212	368	406	158	490	227	432	4,280	3,790	3,760	4,350	3,400	3,880	3,730	6.75	6.52	6.67	6.12	6.97	6.54	6.68	25	42	43	29	45	37	46
Mar-12	161	344	385	157	492	238	410	4,210	3,780	3,750	4,380	3,700	3,880	3,690	7.01	6.51	6.75	6.23	6.99	6.47	6.70	24	40	42	28	47	39	46
Apr-12	132	327	385	149	484	215	351	4,240	3,810	3,730	4,370	3,720	3,810	3,660	6.54	6.36	6.54	5.90	6.95	6.41	6.62	26	40	42	29	47	39	46
May-12	182	341	396	126	478	230	375	4,250	3,830	3,750	4,370	3,750	3,830	3,620	6.70	6.47	6.79	6.05	7.00	6.34	6.54	23	40	39	29	46	39	46
Jun-12	180	251	380	134	446	223	363	4,080	3,750	3,760	4,280	3,780	3,840	3,500	6.67	6.53	6.61	6.00	6.98	6.52	6.65	23	39	39	28	45	43	40
Jul-12	180	245	360	133	417	389	349	4,100	3,690	3,560	4,340	3,740	3,670	3,420	6.61	6.50	6.66	6.03	6.91	6.81	6.41	23	39	39	29	45	41	41
Aug-12	178	296	373	135	418	384	332	3,860	3,730	3,650	4,240	3,810	3,690	3,630	7.05	7.27	6.57	6.11	6.91	6.82	6.47	23	38	39	28	44	42	41
Sep-12	225	222	382	118	417	391	328	3,840	3,630	3,550	4,190	3,740	3,980	3,640	7.43	6.97	6.95	6.20	7.10	6.98	6.60	22	40	39	28	45	76	40
Oct-12	225	238	389	116	401	267	339	3,890	3,960	3,610	4,230	3,810	3,810	3,650	7.07	6.35	6.78	6.20	7.02	6.88	6.61	22	39	38	28	44	60	41
Nov-12	216	226	358	101	388	239	355	3,830	3,670	3,570	4,190	3,810	4,030	3,580	7.29	6.43	6.78	6.17	7.02	7.05	6.93	21	40	39	29	43	38	42
Dec-12	NA	297	430	96	384	228	329	NA	3,690	3,560	4,200	3,750	3,920	3,590	NA	6.42	6.77	5.84	6.81	6.89	6.60	NA	40	40	29	42	36	40
Jan-13	257	293	395	106	383	237	319	4,140	4,000	3,790	4,410	3,820	4,500	4,020	7.03	6.67	6.93	6.50	6.91	6.53	6.59	21	40	39	29	39	35	41
Feb-13	303	307	386	103	409	187	376	4,240	4,020	3,760	4,390	4,190	3,860	3,790	7.85	6.51	6.83	6.02	6.89	6.96	6.57	21	38	39	29	40	35	41
Mar-13	301	306	397	106	371	NA	377	4,180	4,030	3,780	4,390	4,090	NA	3,710	7.77	6.47	6.77	6.07	6.80	NA	6.78	20	38	38	28	38	NA	41
Apr-13	301	268	399	107	374	187	364	3,980	3,840	3,600	4,150	4,060	4,260	3,690	7.60	6.52	6.81	6.09	6.77	6.40	6.59	20	38	37	28	40	34	41
May-13	329	269	465	72	345	174	371	3,910	3,850	3,620	4,110	4,020	4,150	3,640	7.70	6.42	6.82	6.38	6.70	7.39	6.88	20	38	36	28	38	32	42
Jun-13	332	276	365	70	343	203	374	4,020	3,990	3,530	4,100	4,200	4,290	3,730	7.44	6.52	6.42	6.47	6.67	6.24	6.59	19	37	36	27	38	30	42
Jul-13	316	283	344	69	339	187	374	3,900	3,880	3,440	4,000	4,100	4,260	3,500	7.46	6.41	6.53	6.96	6.65	6.31	6.72	19	36	36	27	40	32	41
Aug-13	297	288	356	100	345	170	385	3,860	3,950	3,610	3,910	4,110	4,190	3,660	7.10	6.46	6.47	7.04	6.60	7.54	6.61	19	36	36	27	38	32	41
Sep-13	320	280	349	NA	319	174	396	3,820	3,880	3,490	NA	4,030	4,300	3,680	7.60	6.60	6.44	NA	6.76	7.00	6.77	21	36	35	NA	37	31	41
Oct-13	345	279	345	108	324	197	407	3,870	3,890	3,470	3,980	4,040	4,040	3,410	7.58	6.86	6.79	6.83	6.98	6.46	6.61	20	36	35	29	38	31	42
Nov-13	360	273	351	200	335	177	401	3,800	4,030	3,510	3,920	4,060	4,000	3,440	7.03	6.51	6.76	6.61	6.85	7.56	7.11	20	35	35	29	36	30	42
Dec-13	405	260	361	167	313	181	416	3,810	4,040	3,640	3,690	4,080	3,890	3,460	6.96	6.49	6.67	6.61	6.77	7.47	7.06	20	35	35	26	35	30	42
Jan-14	352	226	389	88	NA	184	410	3,580	3,970	3,650	3,670	NA	4,260	3,540	6.89	6.48	6.79	7.00	NA	6.83	6.81	18	35	35	26	NA	29	43
Feb-14	360	227	363	121	315	NA	396	3,860	4,010	3,400	3,720	4,070	NA	3,480	7.39	6.53	6.82	6.85	6.82	NA	7.02	18	35	35	26	36	NA	42
Mar-14	384	229	416	129	339	167	404	3,830	3,990	3,650	3,610	4,120	3,280	3,470	7.18	5.98	6.84	6.61	6.94	6.68	7.06	18	35	34	25	37	30	42
Apr-14	423	227	438	NA	368	191	404	3,760	3,950	3,650	NA	4,130	3,980	3,080	6.80	5.75	6.85	NA	7.01	6.48	6.75	18	35	34	NA	37	30	42
May-14	398	223	435	123	354	162	392	3,730	3,970	3,620	3,720	4,090	3,930	3,360	7.09	6.54	6.81	6.75	6.98	7.62	7.02	19	35	35	25	36	29	42
Jun-14	428	209	437	106	358	NA	379	3,710	3,960	3,640	3,720	4,110	NA	3,280	6.99	6.50	6.83	7.01	6.85	NA	6.82	19	35	35	25	35	NA	42
Jul-14	416	210	441	105	350	171	341	3,850	4,170	3,810	3,990	4,270	3,610	3,520	7.15	6.33	6.66	6.84	6.76	7.46	6.57	19	35	34	25	35	35	40
Aug-14	446	227	444	107	341	183	362	3,910	4,230	3,830	4,010	4,280	4,210	3,560	7.61	6.32	6.73	6.66	6.94	7.65	6.88	19	35	35	25	35	29	40
Sep-14	455	227	505	100	309	190	373	3,740	4,100	3,840	3,900	4,190	4,010	3,500	7.05	6.31	7.03	6.53	6.85	7.71	7.09	20	35	34	24	35	28	40
Oct-14	460	189	414	108	304	192	362	3,780	4,220	3,850	4,060	4,300	4,330	3,580	6.77	6.40	6.75	6.72	6.74	7.08	6.73	18	35	34	24	34	29	40
Nov-14	476	209	469	148	304	154	340	3,750	4,170	3,890	4,030	4,290	3,210	3,680	6.98	6.49	6.84	7.02	6.88	6.65	7.50	18	35	35	25	34	25	40
Dec-14	458	219	464	125	273	144	358	3,660	4,040	3,800	3,930	4,170	4,030	3,710	7.12	6.49	6.88	6.83	6.96	7.63	7.24	18	35	34	25	33	31	41
Jan-15	455	219	440	140	279	186	378	3,650	4,110	3,810	3,900	4,290	4,300	3,680	7.09	6.48	6.92	7.01	6.69	6.97	6.86	18	35	35	25	33	31	41

wood.

TABLE 12

Zone 3 Field Parameter Measurements of NW and MW-Series Wells Through October 2019
United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

	Bicarbonate (mg/L)							Conductivity (umhos/cm)							pH (s.u.)							Chloride (mg/L)						
Date	NW-1	NW-2	NW-3	NW-4	NW-5	MW-6	MW-7	NW-1	NW-2	NW-3	NW-4	NW-5	MW-6	MW-7	NW-1	NW-2	NW-3	NW-4	NW-5	MW-6	MW-7	NW-1	NW-2	NW-3	NW-4	NW-5	MW-6	MW-7
Feb-15	494	210	466	141	246	172	361	3,710	4,120	3,870	3,950	4,060	4,160	3,580	7.30	6.35	6.96	6.69	6.75	7.35	7.38	17	35	35	24	33	30	41
Mar-15	499	194	471	141	253	181	357	3,540	4,050	3,740	3,850	4,020	4,180	3,490	7.32	6.28	7.06	6.61	6.73	7.02	7.48	17	32	34	24	32	29	41
Apr-15	477	194	461	156	260	192	352	3,890	4,380	4,110	4,250	4,570	4,330	3,750	6.94	6.27	6.80	6.42	6.44	6.86	6.48	17	32	36	23	34	29	39
May-15	542	NA	473	135	257	193	343	3,800	NA	3,860	4,100	4,420	4,410	3,671	6.95	NA	6.88	6.77	6.60	7.52	7.16	17	NA	33	23	32	30	40
Jun-15	498	197	476	158	223	196	305	3,770	4,370	4,030	4,180	4,430	4,460	3,940	7.08	6.43	7.03	6.93	6.68	6.33	6.84	17	33	35	23	34	31	40
Jul-15	490	197	480	142	231	208	315	3,800	4,360	4,090	4,120	4,490	4,200	3,620	7.19	6.19	6.74	6.57	6.41	7.18	6.90	17	33	35	23	34	31	38
Aug-15	474	185	456	133	212	191	280	3,770	4,380	4,100	4,120	4,480	4,350	3,620	7.22	6.19	6.93	6.81	6.65	7.68	7.83	17	33	35	23	34	30	38
Sep-15	484	181	488	118	235	224	NA	3,690	4,330	4,030	4,040	4,410	4,210	NA	7.20	6.30	7.05	7.02	6.80	7.87	NA	16	32	35	23	33	30	NA
Oct-15	NA	182	477	116	241	NA	NA	NA	4,270	4,010	4,190	4,400	NA	NA	NA	6.34	7.06	6.93	6.71	NA	NA	NA	32	35	22	33	NA	NA
Nov-15	492	199	488	111	204	NA	263	3,700	4,410	4,040	4,070	4,440	NA	3,830	8.00	6.54	7.05	6.83	6.95	NA	7.88	17	33	36	22	33	NA	38
Dec-15	491	173	518	103	243	NA	276	3,680	4,330	4,090	4,040	4,500	NA	3,800	6.67	6.50	6.94	6.91	6.68	NA	7.07	20	33	35	22	33	NA	38
Jan-16	464	155	526	92	246	NA	272	3,650	4,410	4,430	4,120	4,580	NA	3,360	6.53	6.41	7.22	6.59	6.43	NA	6.52	16	34	38	22	34	NA	37
Feb-16	474	153	496	83	247	NA	255	3,650	4,490	4,280	4,010	4,450	NA	3,940	6.85	6.12	7.19	6.61	6.41	NA	7.84	20	34	37	21	34	NA	37
Mar-16	477	167	506	87	135	NA	251	3,770	4,500	4,390	4,080	4,720	NA	4,040	7.03	6.26	7.51	6.86	6.27	NA	7.35	19	33	36	21	32	NA	38
Apr-16	488	161	512	85	133	NA	258	3,770	4,400	4,370	4,070	4,730	NA	3,940	7.46	6.14	7.40	6.67	6.10	NA	6.76	17	33	36	21	32	NA	38
May-16	482	NA	494	85	139	NA	261	3,740	NA	4,390	4,100	4,720	NA	3,940	7.48	NA	7.50	6.62	6.26	NA	6.46	17	NA	36	21	32	NA	38
Jun-16	429	138	497	87	99	NA	242	3,720	4,570	4,470	4,120	4,880	NA	3,890	7.57	6.27	7.47	6.73	6.09	NA	7.84	16	29	34	20	30	NA	35
Jul-16	459	160	437	79	98	NA	239	3,730	4,550	4,400	4,060	4,800	NA	3,860	7.50	6.26	7.40	6.63	6.10	NA	6.50	15	29	35	20	30	NA	34
Aug-16	430	163	239	82	106	NA	223	3,440	4,300	4,010	3,840	4,530	NA	3,840	7.56	6.19	7.14	6.67	6.04	NA	7.92	14	29	33	21	30	NA	34
Sep-16	442	165	427	79	113	NA	227	3,520	4,370	4,170	3,920	4,590	NA	3,820	7.54	6.24	7.26	6.78	6.05	NA	7.99	16	29	32	21	30	NA	34
Oct-16	449	159	434	71	101	NA	229	3,700	4,500	4,300	4,040	4,720	NA	3,850	7.36	6.20	7.24	6.80	6.08	NA	6.39	15	30	32	20	30	NA	34
Nov-16	467	156	445	55	99	NA	213	3,610	4,430	4,160	3,980	4,730	NA	3,900	7.35	6.24	7.42	6.50	6.10	NA	7.92	15	31	33	22	30	NA	35
Dec-16	427	145	429	55	80	NA	201	3,390	4,420	3,910	3,950	4,690	NA	3,830	7.29	6.26	7.37	6.18	5.98	NA	7.32	15	31	33	22	31	NA	35
Jan-17	463	146	441	55	80	NA	240	3,600	4,340	4,110	3,890	4,640	NA	4,060	7.06	6.34	7.40	6.79	6.08	NA	6.54	15	31	33	22	31	NA	35
Feb-17	421	152	440	19	32	NA	231	3,490	4,340	3,900	3,790	4,490	NA	3,770	7.08	6.21	7.42	5.22	5.90	NA	7.66	14	31	34	22	31	NA	35
Mar-17	463	148	463	33	64	NA	208	3,750	4,410	4,120	4,020	4,710	NA	4,090	6.85	6.10	7.28	6.30	5.71	NA	7.66	14	31	34	22	31	NA	34
Apr-17	463	134	407	41	58	NA	224	3,800	4,450	4,130	4,030	4,780	NA	3,970	7.12	6.10	6.97	6.72	5.66	NA	6.39	16	31	35	22	31	NA	34
May-17	420	136	438	38	49	NA	213	3,800	4,480	4,140	4,080	4,870	NA	4,000	7.12	6.12	7.19	6.34	5.69	NA	7.29	15	31	34	21	30	NA	33
Jun-17	413	128	415	30	49	NA	213	3,690	4,350	3,990	3,980	4,790	NA	3,940	7.15	6.04	7.26	6.60	6.05	NA	7.32	15	31	35	21	30	NA	35
Jul-17	445	134	396	39	34	NA	215	3,660	4,460	4,040	4,000	4,900	NA	3,770	7.10	6.03	6.96	6.80	5.40	NA	6.37	15	31	35	21	30	NA	34
Aug-17	408	139	405	36	16	NA	219	3,580	4,380	3,940	3,920	4,750	NA	3,800	7.17	6.04	7.22	6.47	5.54	NA	7.93	15	30	35	22	31	NA	33
Sep-17	390	149	396	40	36	NA	222	3,550	4,360	3,960	3,950	4,730	NA	3,750	7.24	6.14	7.23	6.70	5.70	NA	7.48	16	29	34	22	30	NA	34
Oct-17	396	141	432	43	30	NA	243	3,700	4,470	4,080	4,040	4,860	NA	3,880	7.05	6.14	7.23	6.71	5.48	NA	6.80	16	29	35	23	31	NA	34
Nov-17	389	150	433	51	24	NA	226	3,620	4,390	3,930	3,930	4,760	NA	3,870	7.17	6.09	7.10	6.51	5.33	NA	7.65	16	30	35	22	32	NA	35
Dec-17	390	NA	447	48	18	NA	226	3,540	NA	4,000	3,950	4,820	NA	3,950	6.71	NA	7.40	6.66	5.25	NA	7.69	15	NA	36	22	32	NA	36
Jan-18	378	141	429	37	17	NA	259	3,580	4,440	4,040	3,980	4,840	NA	3,840	6.79	5.89	7.47	6.03	5.14	NA	7.66	16	31	34	23	32	NA	37
Feb-18	359	140	484	30	24	NA	222	3,690	4,380	3,910	3,910	4,650	NA	3,930	7.50	6.14	7.30	5.91	5.55	NA	7.51	16	30	33	22	33	NA	36
Mar-18	364	132	475	32	24	NA	213	3,550	4,360	3,930	3,840	4,660	NA	3,920	6.99	6.11	7.43	6.40	5.57	NA	7.21	14	30	33	21	31	NA	35
Apr-18	356	116	432	26	13	NA	210	3,570	4,300	3,920	3,800	5,390	NA	3,720	6.99	6.02	7.21	6.42	4.52	NA	7.53	15	29	31	21	30	NA	33
May-18	354	116	493	24	14	NA	206	3,620	4,400	3,990	3,850	4,750	NA	3,850	7.28	5.97	7.17	6.22	5.27	NA	7.64	14	29	30	21	30	NA	33
Jun-18	349	110	445	21	18	NA	190	3,600	4,450	3,970	3,830	4,740	NA	3,450	7.13	5.99	7.24	6.24	5.22	NA	7.81	15	29	33	21	30	NA	33
Jul-18	300	98	390	18	12	NA	207	3,510	4,390	3,960	3,830	4,540	NA	3,900	7.22	5.83	7.10	6.20	4.98	NA	7.44	15	30	33	22	30	NA	33
Aug-18	256	85	408	18	9	NA	191	3,500	4,470	3,930	3,920	4,770	NA	3,600	7.29	5.88	6.91	5.81	4.80	NA	6.65	14	29	34	21	30	NA	32
Sep-18	306	97	420	18	40	NA	189	3,500	4,380	3,890	3,870	4,630	NA	3,920	7.28	5.89	7.10	6.24	5.52	NA	6.99	14	29	34	21	29	NA	33
Oct-18	329	100	448	18	55	NA	201	3,720	4,610	4,100	4,040	4,850	NA	4,230	7.23	6.02	6.96	6.31	5.86	NA	6.29	14	30	34	21	29	NA	33
Nov-18	341	98	475	0	55	NA	146	3,680	4,540	4,070	4,080	4,820	NA	3,960	6.77	5.99	7.11	5.02	5.72	NA	7.73	14	30	34	21	30	NA	34
Dec-18	346	85	499	14	52	NA	158	3,710	4,560	4,050	4,060	4,810	NA	3,980	6.76	5.94	6.89	6.45	5.59	NA	7.47	15	30	33	21	30	NA	35
Jan-19	335	67	421	19	97	NA	144	3,670	4,560	4,210	4,010	4,830	NA	4,260	6.71	5.88	7.32	6.30	6.02	NA	7.47	15	30	35	21	29	NA	35
Feb-19	311	NA	402	18	68	NA	134	3,700	NA	3,730	3,960	4,800	NA	4,020	6.74	NA	6.92	6.35	5.70	NA	7.22	15	NA	32	21	30	NA	34
Mar-19	341	48	469	17	55	NA	122	3,720	4,540	4,200	3,990	4,710	NA	3,500	6.61	5.49	7.01	6.26	5.75	NA	7.63	15	29	31	21	30	NA	34
Apr-19	325	NA	469	20	55	NA	183	3,510	4,490	4,170	3,830	4,600	NA	4,210	6.88	5.94	7.34	6.53	5.90	NA	6.32	15	NA	31	21	30	NA	33
May-19	284	61	499	22	49	NA	146	3,600	4,490	4,110	3,900	4,850	NA	4,200	7.56	5.86	7.37	6.15	5.94	NA	7.33	15	29	32	20	30	NA	34
Jun-19	NA	24	536	22	44	NA	134	NA	4,450	4,170	3,950	4,930	NA	4,020	NA	5.73	7.07	6.29	5.74	NA	7.43	NA	29	33	21	31	NA	34
Jul-19	NA	21	451	18	64	NA	195	NA	4,490	4,140	3,860	4,930	NA	4,230	NA	5.24	7.45	6.12	5.80	NA	6.30	NA	30	34	23	31	NA	35
Aug-19	NA	18	445	21	30	NA	152	NA	4,550	4,210	3,990	5,080	NA	3,810	NA	5.13	7.08	5.86	5.40	NA	7.61	NA	29	33	23	31	NA	35
Sep-19	NA	13	347	20	57	NA	154	NA	4,270	3,890	3,770	4,780	NA	4,270	NA	5.14	7.05	6.21	5.72	NA	7.60	NA	29	35	22	31	NA	36
Oct-19	NA	12	378	18	18	NA	159	NA	4,380	4,170	3,990	4,930	NA	4,250	NA	4.60	7.00	5.96	5.04	NA	6.24	NA	28	35	22	28	NA	36

NA indicates that data are not available because a sample was not or could not be collected.
No Sample for well NW-2 on 12-20-17 due to pump failure.
July 2019 samples for wells NW-2 through NW-5 were collected August 2, 2019.
Recent field pH and bicarbonate decreases.
MW-7 wide variation of field pH continues in 2019.
In well MW-1, there was insufficient water volume to collect samples between June and December 2019.
In well NW-2, no samples were collected in February or April 2019 due to mechanical issues with the pump.

wood.

TABLE 13
Historical Zone 3 Seepage Migration Evaluation
United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

End Point Well	Starting Point	Distance Between Both Points (ft)	Time for Onset		Travel Time (ft/yr)	Basis for Determining Onset Date for Seepage Impacts At Selected Points
			Seepage Impacts at Starting Point (date)	Seepage Impacts at End Point (date)		
420	North Cell	2,100	1980	Oct-02	95	Bicarbonate concentration greater than 500 mg/L
504 B	North Cell	2,450	1980	Jul-92	204	Bicarbonate concentration less than 100 mg/L
EPA 14	North Cell	1,520	1980	Apr-96	95	Bicarbonate concentration greater than 500 mg/L
PB 2	North Cell	3,080	1980	Oct-02	140	Bicarbonate concentrations first declining to 50 mg/L at Well PB 2
PB 2	504 B	630	Jul-92	Oct-02	61	Bicarbonate concentrations first declining to 50 mg/L at each well
PB 4	PB 2	52	Apr-03	Feb-04	60	Bicarbonate concentrations first persistently at or below 50 mg/L at each well
PB 4	PB 2	52	Jan-08	Nov-08	58	Bicarbonate concentrations again declined to below 50 mg/L at each well
PB 3	PB 4	53	Oct-12	Mar-13	128	Bicarbonate concentrations declined to below 50 mg/L at Well PB 3
			Geometric Mean		96	

End Point Well	Starting Point Well	Distance Between Both Points (ft)	Time for Onset		Net Migration Distance (ft)	Basis for Determining Onset Date for Seepage Impacts At Selected Points
			Seepage Impacts at Starting Point (date)	Seepage Impacts at End Point (date)		
NBL 1	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Since Dec-05, water quality in the northern tracking wells (including NBL 1) has varied significantly (for example, see the field bicarbonate measurements in Table 11 and the lab bicarbonate measurements shown in Figure 40). This reflects the influence of pumping systems (which have changed over time) and variable mixing of impacted water with background water drawn in from the west. Full seepage impact has occurred at PB 4 since Nov-08 (bicarbonate < 50 mg/L) or Jan-09 (pH < 5.0). To the north of this well, NBL 1 has historically shown strongly degraded water quality in terms of both bicarbonate and pH (Table 11) as well as other constituents (see laboratory analytical data for Jan-13 [subsequent sampling was suspended due to water level decline] in Appendix B; e.g., elevated aluminum, cobalt, and nickel). Based on these data, the leading edge of the impacted water is shown as passing through NBL 1 in Figure 35. Between impacted wells PB 4 and NBL 1, the water quality at PB 3 significantly improved during 2010 and 2011 and was stable until Oct-12 when seepage impact began (Table 11 and Appendix B), indicating the high degree of geochemical variability, sometimes at very close spacing, in the northern part of Zone 3. Note that full seepage impact occurred at PB 3 since Mar-13 (bicarbonate < 50 mg/L) or Apr-13 (pH < 5.0). Water quality improved significantly at PB 3 since Nov-2014, but the most recent monitoring suggests partial impact (pH > 5.0 [6.97]), but bicarbonate approximately equal to 50 mg/L).

wood.

TABLE 14

Detected Constituents in Zone 3, October 2019
United Nuclear Corporation, Church Rock Site
Church Rock, New Mexico

Chemical Name	License NRC Standard	EPA Cleanup Level	Unit	0420	0517	0613	0708	0711	0717	0717 FD	0719	EPA 13	EPA 14	MW-7	NBL-02	NW-2	NW-3	NW-4	NW-5	RW-11	RW-A
Section #				**36**	**36**	**2**	**36**	**36**	**36**	**36**	**36**	**36**	**36**	**36**	**36**	**36**	**36**	**36**	**36**	**36**	**36**
ALUMINUM	-	5	mg/l	0.04	18	520	37.2	30	235	238	4.2		2.2				0.27		9.4		0.29
AMMONIA (AS N)	-	-	mg/l	3.5	6.5	131	0.75	1.4	21	21	0.43	0.07	10.0				0.30		0.6	4.3	0.64
ARSENIC	0.757	0.757	mg/l	0.008	0.003	0.007	0.002	0.001	0.007	0.006	0.005	0.072		0.037			10.4		0.133	0.002	
BERYLLIUM	0.05	0.004	mg/l		0.02	0.134	0.058	0.043	0.166	0.164	0.004	0.001	0.006						0.003		0.002
BICARBONATE (HCO3)	-	-	mg/l	260							25	60	143	193	320		390	19		117	25
CADMIUM	0.09	0.09	mg/l		0.003	0.043			0.016	0.016			0.003								
CALCIUM	-	-	mg/l	638	453	432	441	442	481	467	494	436	490	579	596		611		540	545	498
CHLORIDE	-	250	mg/l	39	31	104	25	25	47	45	30	41	45	33	39	26	35	19	28	32	27
COBALT	-	0.391	mg/l	0.119	0.88	1.73	0.482	0.74	0.98	0.976	0.248	0.122	0.276	0.282	0.020		0.012		0.44	0.353	0.403
GROSS ALPHA	39.7	39.7	pci/l	7.2	15.8	30.1	18	11.5	21	17.7	9.1	8.2	6.2	10.9	8.6		28.2		28.6	17.0	21.3
LEAD	0.08	0.08	mg/l			0.024	0.01	0.007	0.016	0.019			0.003						0.009		
LEAD-210	5.7	5.7	pci/l	0.7	1.9	0.2	1.4	0.6	1.8	2.1	1.0	0.6	1.1	0.9	0.3		1.2		2.9	0.7	0.7
MAGNESIUM	-	-	mg/l	197	576	684	568	482	423	424	740	957	280	403	160		292		557	522	661
MANGANESE	-	9.1	mg/l	4.43	12.9	42.9	13.1	9.1	14.8	15.1	6.08	6.81	4.79	5.47	1.50		3.71		6.78	6.34	6.99
MOLYBDENUM	-	66.1	mg/l	0.23		0.004	0.007	0.006			0.541	0.143	0.021	0.199	0.109		0.459		0.23	0.163	0.009
NICKEL	0.569	0.569	mg/l	0.099	0.89	1.72	0.514	0.517	1.07	1.07	0.341	0.158	0.201	0.292	0.043		0.006		0.451	0.348	0.458
NITRATE (NO3)	-	190	mg/l	0.18		1.4		0.01	0.23	0.2	0.03	0.08	0.33	0.70	0.13						
PH (FIELD)	-	-	su	6.33	3.16	2.98	3.75	4.01	3.42	3.58	5.22	5.90	5.65	6.24	6.65	4.60	7.00	5.96	5.04	6.16	6.25
PH (LAB)	-	-	su	6.71 H	3.42 H	2.98 H	3.32 H	3.23 H	3.45 H	3.50 H	5.48 H	6.07 H	5.78 H	6.49 H	6.75 H	4.56 H	6.92 H	6.13 H	4.30 H	6.18 H	5.61 H
POTASSIUM	-	-	mg/l	10	14	3	14	12	8	8	13	16	10	10	8		9		12	12	13
RADIUM-226	-	-	pci/l	5.2	7.8	11.2	7.7	7.6	10.1	10.0	4.9	5.5	3.8	10.0	5.9		17.7		15.0	10.9	16.9
RADIUM-228	-	-	pci/l	5.7	12.9	2.8	3.3	10.6	13.7	13.3	12.5	7.9	4.7	9.3	7.6		9.3		9.3	15.3	16.0
RADIUM 226 & 228	35.2	35.2	pci/l	10.9	20.7	14.0	11.0	18.2	23.8		17.1	13.4	8.5	19.3	13.5		27.0		24.3	26.2	32.9
SELENIUM	0.01	0.05	mg/l			0.02			0.009	0.009											
SODIUM	-	-	mg/l	143	151	225	123	112	165	160	154	183	146	156	143		160		160	144	158
SULFATE (SO4)	-	5693	mg/l	2380	4270	7910	4280	3800	4600	4580	4550	5420	2700	3170	2220		2740		3980	3630	4330
THORIUM-230	17	17	pci/l	0.06	4.8	491	0.5	0.5	2.8	2.6	0.2	0.02	0.06	0.07	0.1		0.008		0.6		0.2
TOTAL DISSOLVED SOLIDS (LAB)	-	8592	mg/l	3800	6190	10700	6310	5400	6420	6410	6320	7550	3960	4750	3630	4930	4420	4310	5650	5280	6060
TOTAL TRIHALOMETHANES	80	80	ug/l		4.6	66		0.92		0.83				0.5							
URANIUM	0.395	0.395	mg/l	0.168	0.189	0.602	0.104	0.186	0.714	0.723	0.121	0.0047	0.302	0.0406	0.252		0.174		0.042	0.053	0.0091
VANADIUM	0.1	0.1	mg/l			0.94															

Blank cells indicate that the analyte was not detected
Dash (-) indicates that the analysis was not performed
Shaded values exceed the listed action level
B- Possible blank contamination
D - Reporting limit increased due to sample matrix
H - Analysis performed past recommended holding time
FD indicates a field duplicate sample
Only field parameters & selective lab analysis (bicarbonate, chloride, pH & TDS) were collected and analyzed in NW-2 & NW-4

wood.

TABLE 15

Zone 1 Performance Monitoring Program, 2019 Operating Year
United Nuclear Corporation, Church Rock Site
Church Rock, New Mexico

Well[1]	Water Level[2]	Water Quality[2]	NRC POC	Purpose
Continue Monitoring				
515 A	X	X		Track transition area
604	X	X	Y	Track center of seepage
614	X	X	Y	Track transition area
EPA 2	X	X		Postmining-pretailings background water quality
EPA 4	X	X	Y	Postmining-pretailings background water quality
EPA 5	X	X	Y	Track transition area
EPA 7	X	X	Y	Track transition area, edge of saturation
EPA 8	X			Track edge of saturation, water levels only
142	X	X		Premining background
143	X			Water level only, use 142
Additional Wells, Not Included In Original Performance Monitoring Program				
505 A	X			Long-term water level for migration path
502 A	X			Long-term water level for migration path
501 A	X			Long-term water level for migration path
504 A	X			Long-term water level for migration path
412	X			Long-term water level for migration path
Total	15	8	5	

Eliminated From Monitoring				Reason For Elimination
141				No longer useable, plugged during arroyo flooding
516 A			Y	Failed low-flow testing
619				Anomalous water quality and water level
615				Decommissioned pumper, not needed - use 515 A
616				Decommissioned pumper, not needed - use 604
617				Decommissioned pumper, not needed

Notes:
1. No wells within the tailings reclamation cap were included.
2. Water level and water quality monitored on a quarterly basis.

wood.

TABLE 16

Zone 1 Saturated Thickness, October 2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Well	Water Level Measurement Date	Zone 1 Unsaturated Thickness	Zone 1 Saturated Thickness	Zone 1 Percentage Saturated
0142	10/9/2019	0.00	55.00	100%
0143	10/15/2019	0.00	52.00	100%
0412	10/15/2019	0.00	76.00	100%
0501 A	10/15/2019	11.74	53.26	82%
0502 A	10/15/2019	0.00	59.00	100%
0504 A	10/15/2019	8.21	59.79	88%
0505 A	10/15/2019	0.00	46.00	100%
0515 A	10/2/2019	31.61	9.39	23%
0604	10/2/2019	29.26	15.74	35%
0614	10/2/2019	25.88	19.12	42%
EPA 02	10/9/2019	23.32	26.68	53%
EPA 04	10/8/2019	21.29	33.71	61%
EPA 05	10/8/2019	32.86	16.14	33%
EPA 07	10/8/2019	33.53	49.47	60%
EPA 08	10/15/2019	29.98	36.02	55%

TABLE 17

Detected Constituents in Zone 1, October 2019

United Nuclear Corporation, Church Rock Site

Church Rock, New Mexico

Chemical Name	License NRC Standard	EPA Cleanup Level	Unit	0142	0515 A	0604	0614	EPA 02	EPA 02 FD	EPA 04	EPA 05	EPA 07
		Section #		36	2	2	2	1	1	1	1	1
ALUMINUM	-	5	mg/l	0.05	0.41 D	1.2					0.18	0.07
AMMONIA (AS N)	-	-	mg/l	0.07	17 D		98 D	0.2	0.33		17 D	
ARSENIC	0.05	0.01	mg/l	0.001				0.001	0.001	0.001	0.001	
BERYLLIUM	0.05	0.004	mg/l			0.002						
BICARBONATE (HCO3)	-	-	mg/l	307	766	29 H	1490	258	273	176	43	533
CADMIUM	0.01	0.01	mg/l		0.001	0.002						0.001
CALCIUM	-	-	mg/l	71	445	439	537	458	537	492	477	514
CHLORIDE	-	250	mg/l	17	365 D	109 D	313 D	25	25	38	38	266 D
COBALT	-	0.05	mg/l		0.023	0.106					0.043	0.106
GROSS ALPHA	15	15	pci/l	1.2	3.4	2.4	1.8	2	2.2	1.5	2.3	2.4
LEAD	0.05	0.05	mg/l		0.001		0.002					
LEAD-210	4.7	4.7	pci/l								0.08	
MAGNESIUM	-	-	mg/l	36	1270	765	613	214	224	393	460	883
MANGANESE	-	5.4	mg/l	0.033 D	6.62 D	4.57 D	0.922 D	1.66 D	2.04 D	2.46 D	0.228 D	2.86 D
MOLYBDENUM	-	1	mg/l	0.007	0.001			0.001	0.001			0.004
NICKEL	0.07	0.2	mg/l	0.005	0.099	0.197	0.014				0.035	0.119
NITRATE (NO3)	-	190	mg/l	0.44	36 D	59 D	107 D	0.16	0.02	0.57	20 D	104 D
PH (FIELD)	-	-	su	7.91	6.02	5.34	6.37	6.99	6.94	6.85	6.27	6.18
PH (LAB)	-	-	su	7.62 H	6.09 H	5.5 H	6.61 H	7.12 H	6.83 H	6.74 H	6.13 H	6.31 H
POTASSIUM	-	-	mg/l	5	19	13	15	8	11	9	11	10
RADIUM-226	-	-	pci/l	0.7	2.2	1.3	0.8	1.6	1.8	1.1	1.8	0.9
RADIUM-228	-	-	pci/l	0.7	4.9	4.1	2.5	0.6	0.2	0.1	-0.5	-0.6
RADIUM 226 & 228	12.1	12.1	pci/l	1.40	7.1	5.4	3.3	2.2	2	1.2	1.3	0.3
SELENIUM	0.01	0.05	mg/l		0.068	0.053	0.069					0.082
SODIUM	-	-	mg/l	331	580	299	442	224	156	181	108	374
SULFATE (SO4)	-	5539	mg/l	745 D	6280 D	4650 D	3400 D	2250 D	2230 D	3140 D	3150 D	4410 D
THORIUM-230	1.6	1.6	pci/l		0.2	0.03	0.009	0.02		0.005		0.02
TOTAL DISSOLVED SOLIDS (LAB)	-	8020	mg/l	1350 DH	10500 DH	7150 DH	6760 DH	3590 DH	3590 DH	4660 DH	4580 DH	7570 DH
TOTAL TRIHALOMETHANES (CHLOROFORM)	80	80	ug/l		390	16	196					0.4
URANIUM	0.238	0.238	mg/l	0.0003	0.0082 D	0.0004	0.0435 D	0.0023	0.0026	0.0004	0.0026	0.0024
VANADIUM	0.1	0.1	mg/l									

Blank cells indicate that the analyte was not detected

Shaded values exceed the listed action level

D - Reporting limit increased due to sample matrix

H - Analysis performed past recommended holding time

FD indicates a field duplicate sample

wood.

TABLE 18

Predicted Performance of the Zone 1 Natural Attenuation System, 2019
United Nuclear Corporation, Church Rock Site
Church Rock, New Mexico

Constituent	Will Standards* Be Met?		Remarks
	Section 1	Section 36	
Manganese	Yes?	Yes	Not regulated by NRC. Revised EPA standard higher than previous standard. Dependent on bicarbonate availability. No 2019 exceedances outside Section 2. Well 515A (within Section 2 boundary) typically exceeds EPA standard.
Sulfate	Yes?	Yes	Not regulated by NRC. Revised EPA standard higher than previous standard. Limited by calcium availability. No 2019 EPA standard exceedances outside Section 2, but Well 515A (within Section 2 boundary) typically exceeds EPA standard.
Chloride	Maybe	Yes	Not regulated by NRC. Recent gradually increasing chloride concentration trend at Well EPA 7 in Section 1 appears to have stabilized. No 2019 exceedances of EPA standard (250 mg/L) outside Section 2. Exceedances typical at Wells 515A and 614 within Section 2 boundary.
TDS	Yes?	Yes	Not regulated by NRC. Revised EPA standard higher than previous standard. Governed by sulfate concentration. No 2019 exceedances outside Section 2, but Well 515A (within Section 2 boundary) concentration typically exceeds revised EPA standard.
Metals	Maybe	Yes	Attenuated by neutralization and adsorption. Well EPA 7 within Section 1 had four 2019 exceedances of NRC nickel standard (but not the EPA standard), four exceedances of EPA cobalt standard, and three exceedances of both the EPA and NRC selenium** standards. Exceedances were also reported at the following Section 2 locations: Well 515A (four exceedances of NRC nickel standard [but not the EPA standard] and three exceedances of the EPA and NRC selenium** standards); Well 604 (four exceedances of NRC nickel standard, two exceedances of EPA nickel standard, four exceedances of EPA cobalt standard, and three exceedances NRC selenium** standards [two of which exceeded the EPA selenium standard]; and POC Well 614 (three exceedances of the EPA and NRC selenium** standards).
Radionuclides	Yes	Yes	Attenuated by neutralization and adsorption. No 2019 exceedances.
TTHMs	Yes?	Yes	Attenuated by degradation, dilution, and dispersion. No exceedances outside Section 2. Exceedances of NRC/EPA standard in 2019 within Section 2 include Well 515A (three 2019 exceedances) and POC Well 614 (three 2019 exceedances).

Notes:
* Based on NRC and EPA standards updated 2015
** Selenium and arsenic analyses modified in April 2019. See discussion in Section 1.4.1.

wood.

wood.

Appendix A: Southwest Alluvium Monitoring Data (Table A.1) with Introductory Text;

Figure A-1 (Southwest Alluvium Monitoring Well Locations); and

2019 Laboratory Groundwater Analytical Reports

APPENDIX A
SOUTHWEST ALLUVIUM MONITORING DATA

The Southwest Alluvium Remedial Action System was installed in August 1989 and began operating in October 1989. The initial system consisted of three extraction wells (Wells 801, 802, and 803) and four water level observation wells (Wells 804, 805, 806, and 807). An additional extraction well, Well 808, was installed and began operating in June 1991, as required by the Nuclear Regulatory Commission and the U.S. Environmental Protection Agency (EPA). Extraction Wells 801, 802, and 803 are monitored for water quality, and Observation Wells 804, 805, 806, and 807 were monitored for water level elevations on a quarterly basis. Well 801 was decommissioned at the end of July 1999 because it pumped at a rate of less than 0.5 gallon per minute for the previous eight years.

Water level elevations and water quality data were also collected on a quarterly basis from 18 monitoring wells located up-, down-, and cross-gradient from the tailings area. The 18 monitoring wells include Wells GW 1, GW 2, GW 3, GW 4, EPA 22A, EPA 23, EPA 25, EPA 27, EPA 28, 509 D, 632, 29 A, 624, 627, 639, 642, 644, and 645. All of these wells, except for Wells EPA 27 and 29 A, are completed in the alluvium. Well EPA 27 is completed partially in the alluvium and partially in the Mancos formation and Well 29 A is completed in the underlying Zone 1 formation. Consequently, water quality data collected from these two wells may not be representative of alluvial groundwater conditions.

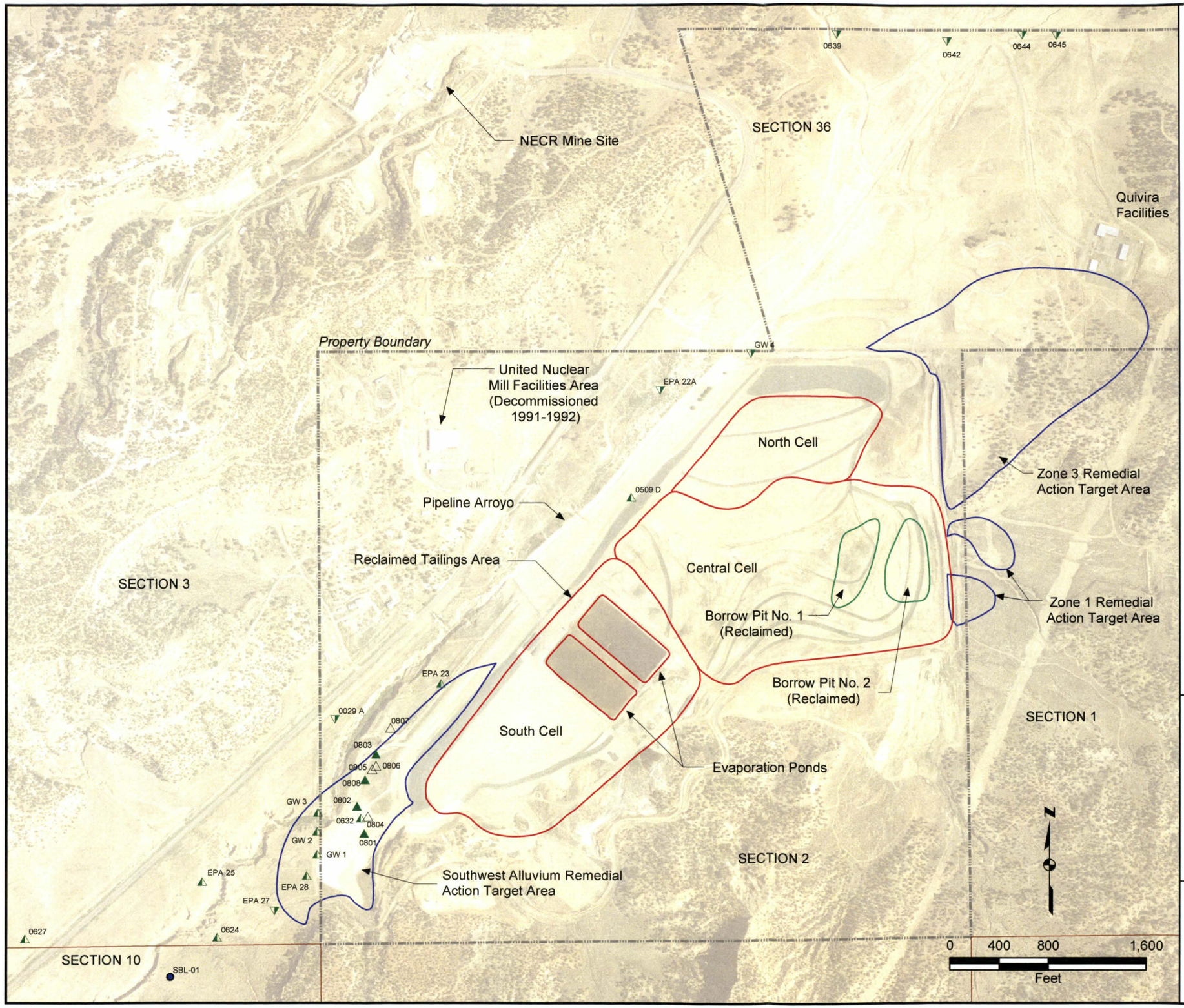
Beginning with the second quarter of 2000, a revised monitoring program was implemented. Changes to the wells included in the monitoring program for the Southwest Alluvium are shown in Table 1B of this 2019 Annual Review Report. See the enclosed Figure A-1 for the current layout of the wells.

Beginning in January 2001, a natural attenuation test was implemented, as requested during the November 14, 2000, meeting in Santa Fe, New Mexico, and as documented in the EPA's email letter from Greg Lyssy, dated November 15, 2000 (Lyssy, 2000). For this test, Extraction Wells 802, 803, and 808 were turned off and added to the revised monitoring program wells. During the 18-month test period, the wells were sampled and water level elevations were measured on a monthly basis. The results of the first 18 months of the natural attenuation test were provided in a report submitted in November 2002 (Earth Tech, 2002c). The natural attenuation test has continued through October 2019 with a quarterly frequency of water quality and water level monitoring.

During July 2004, a new downgradient well was installed within the Southwest Alluvium: SBL-01. The first sampling and water-level measurement of this well occurred in October 2004; quarterly results through October 2019 are included in this appendix. This well is not part of the formal performance monitoring program during 2019.

Wells GW 2 and GW 3 were not sampled beginning in October 2015 and can no longer be safely sampled due to their proximity to the unstable edges of Pipeline Arroyo canyon.

Table A.1 presents the quarterly water level and water quality data for the observation and monitoring wells from the second quarter of 1989 through the fourth quarter of 2019. The laboratory analytical data for 2019 are presented at the end of this appendix.



LEGEND

Southwest Alluvium

- Idled Extraction Well
- Groundwater Quality and Water Level Monitoring Well
- Water Level Monitoring Well
- Dry Monitoring Well
- Monitoring Well Installed in 2004
- Property Boundary
- Section Boudary
- Tailings Pond
- Remedial Action Target Area

Aerial photo taken on August 1, 1996.

FIGURE A-1

Southwest Alluvium Monitoring Well Locations

United Nuclear Corporation Church Rock Site,
Church Rock, New Mexico

wood.

P:\consulting\projects\19\WDC8020.300.304_G.E. Church Rock\GIS\2019 ANNUAL REPORT FIGURES

NOTES FOR TABLE A.1
SOUTHWEST ALLUVIUM DATA SUMMARY, 1989 – 2019

General Notes:

1. NRC standard as listed in License Condition 30, Part B (revised 2015 [NRC, 2015] and with proposed corrections of typographical errors [GE, 2015]), based on updated BTVs for the site [UNC, 2012; GE, 2012b).
2. EPA standard is revised cleanup level based on updated BTV evaluation for the site (Chester Engineers, 2015b) and approved for use to complete Part III of the SWSFS (EPA, 2015).
3. NA - Not applicable.
4. Data qualifiers
    a. D - sample reporting limit was increased due to sample matrix.
    b. E - analyte concentration exceeded instrument calibration range (estimated result)
    c. H - analysis was performed past the recommended method holding time.
    d. U - Not detected at minimum detectable concentration.
5. Values that exceed the NRC and/or EPA standards are shaded.
6. Gross alpha value excludes contribution from radon and uranium.
7. Reporting limit for bicarbonate changed from 0.0 mg/L to 0.1 mg/L in fourth quarter 1997.
8. Reporting limit for cadmium changed from 0.01 mg/L to 0.005 mg/L after fourth quarter 1997. The analytical method changed from EPA 200.7 (ICP) to 200.8 (ICP-MS).
9. NO3 (nitrate) is reported by the laboratory as nitrate + nitrite as N.
10. During August 2007, the NRC issued License Amendment 37 (NRC, 2006b) revising the former 1 ug/L chloroform groundwater protection standard to 80 ug/L for total trihalomethanes (TTHMs) in the Southwest Alluvium, Zone 1 and Zone 3; and also revising the current combined radium-226 and -228 groundwater protection standard of 5 pCi/L to 5.2 pCi/L in the Southwest Alluvium and 9.4 pCi/L in Zone 1. The combined radium standards have been subsequently revised (see Note 1).
11. Energy Laboratory's reporting of radiological analyses changed during 2008 (N.A. Water Systems, 2008d). This affected the reporting of Church Rock sample analyses beginning in April 2008 (2nd quarter). The changes were made to make the reporting methods consistent with Section 7.5 of The United States Nuclear Regulatory Commission's Regulatory Guide 4.14.

    The changes are summarized as follows:

    - A minimum detectable concentration (MDC) is determined and reported for each analysis.
    - Sample results are reported regardless of whether they are lower than the MDC. for the analysis. This may result in the reporting of negative concentrations.
    - Sample results lower than the MDC are qualified with a "U".

    These noted changes affected the reporting of all radiological parameters analyzed in Church Rock samples, except for thorium-230. Energy Labs did not have an approved methodology for determining MDC values for thorium-230. In the absence of MDC values, the historical reporting

limit was used instead. Therefore, U-qualified results for thorium-230 indicate concentrations below a reporting limit rather than an MDC. Otherwise, the reporting of thorium-230 results was treated similarly to other radiological parameters. This means that measured concentrations were reported with a U qualification if the values were below the reporting limit.

The rationale for reporting values below MDC or reporting limit, even if negative, is that errors associated with the reported values are expected, over time, to average to zero. This means that averages or sums (e.g. for total radium) of concentrations will tend to be more accurate if below limit (MDC or reporting) results are retained in the calculations.

12. At the request of EPA, UNC had the laboratory reduce the reporting limits for beryllium and lead. The new reporting limits are lower than the action levels. Beryllium's former reporting limit of 10 ug/L has been reduced to 1 ug/L (using lab method E200.7), and lead's former reporting limit of 50 ug/L has been reduced to 1 ug/L (using lab method E200.8). These changes were implemented during the July 2012 sampling event.
13. The laboratory analytical method for NH4-N was changed from A4500-NH3 G to E350.1 beginning in October 2018. The methods are considered equal and all results will be comparable.
14. Laboratory reporting limits for several analytes were reduced beginning in January 2018. These changes, most of which coincided with a change in the analytical method (from E200.7 to E200.8), are summarized as follows:
    - Aluminum from 0.1 mg/L to 0.03 mg/L.
    - Cadmium from 0.005 mg/L to 0.001 mg/L.
    - Cobalt from 0.01 mg/L to 0.005 mg/L.
    - Manganese from 0.01 mg/L to 0.001 mg/L.
    - Molybdenum from 0.1 mg/L to 0.001 mg/L.
    - Nickel from 0.05 mg/L to 0.005 mg/L.
    - Vanadium from 0.1 mg/L to 0.01 mg/L.
15. Only total values are included in the attached table. Speciation test results are provided for arsenic and selenium in Appendix D.

Specific Notes:

- Well 801 is monitored for water level only beginning in 2nd quarter 2000.
- Well 803 was not sampled in 3rd quarter 1999.
- Well EPA 22A contained insufficient water for sampling beginning 4th quarter 1997.
- Well EPA 27 contained insufficient water for sampling beginning 4th quarter 1997.
- Well GW 4 contained insufficient water for sampling, 1st and 3rd quarters 1996, and 3rd Quarter 1999.
- Well 29 A contained insufficient water for sampling, 1st quarter 1995.
- Well 639 contained insufficient water for sampling, 1st quarter 1995.
- Well 642 contained insufficient water for sampling, 4th quarter 1995.

APPENDIX A
SOUTHWEST ALLUVIUM MONITORING DATA
(CONT.)

- Well 644 contained insufficient water for sampling, 1st quarter 1993.
- Well 645 contained insufficient water for sampling, 1st quarter 1991.
- The following changes to the revised monitoring program were implemented for the Natural Attenuation test beginning January 2001:
  - Well 801 is monitored for water level and water quality.
  - Pumping wells 802, 803, and 808 were temporarily shut off and are monitored for water level and water quality.
  - At the request of EPA, UNC made turbidity measurements during the July and October 2012 sampling events.
  - Wells GW 2 and GW 3 were not sampled beginning in October 2015 and can no longer be safely sampled due to their proximity to the unstable edges of Pipeline Arroyo canyon.

TABLE A.1

Southwest Alluvium Data Summary, 1989-2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
0624	N	7/19/1989	6,860.40	7.30	7.64	4637	565	412	226	4.1	378	2479	108	0.06	116	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	0.003	< 0.1	0.0217	0.6	< 1	0.6	6.9	< 1	6
0624	N	10/16/1989	6,860.40	7.10	7.50	4760	535	399	211	5	456	2182	110	0.1	108	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.01	< 0.1	< 0.05	0.003	< 0.1	0.021	1.6	< 1	1.6	0.5	< 1	1.8
0624	N	1/10/1990	6,860.10	7.20	7.32	4642	562	363	208	3.61	473	2370	110	0.05	118	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.01	< 0.1	< 0.05	0.002	< 0.1	0.022	0.2	1.2	1.4	< 0.2	< 1	0.8
0624	N	4/5/1990	6,860.40	7.10	7.58	4722	559	390	206	3.8	537	2311	115	0.12	130	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.03	< 0.1	< 0.05	0.003	< 0.1	0.02	0.4	< 1	0.4	< 0.2	1.1	0.9
0624	N	7/3/1990	6,859.70	7.10	7.48	4839	553	371	195	3.9	512	2306	113	< 0.05	127	< 1	0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.02	< 0.1	< 0.05	0.001	< 0.1	0.0242	0.7	< 1	0.7	< 0.2	< 1	< 1
0624	N	10/3/1990	6,859.80	7.00	7.75	4783	565	384	215	4	561	2311	117	< 0.05	82	< 1	< 0.1	0.001	< 0.05	< 0.01	0.02	< 0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.022	< 0.2	1.8	1.8	< 0.2	< 1	< 1
0624	N	1/15/1991	6,860.00	7.10	7.55	4686	612	405	212	5.6	528	2468	120	< 0.05	117	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.01	< 0.05	0.01	< 0.1	< 0.05	0.001	< 0.1	0.0268	0.4	< 1	0.4	< 0.2	< 1	< 1
0624	N	4/2/1991	6,860.10	7.20	7.68	4832	555	362	203	3.2	524	2428	130	< 0.05	132	< 1	0.13	< 0.001	< 0.01	< 0.01	0.02	< 0.05	< 0.01	< 0.1	< 0.05	0.001	< 0.1	0.038	0.4	1.5	1.9	< 0.2	< 1	< 1
0624	N	7/17/1991	6,859.20	7.10	7.75	4689	540	335	195	2.9	595	2602	132	0.05	159	< 1	0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	0.002	< 0.1	0.034	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	10/15/1991	6,858.80	6.90	7.54	4640	609	373	186	2.5	549	2327	118	< 0.05	93.9	< 1	0.1	0.001	< 0.01	< 0.01	0.01	< 0.05	0.01	< 0.1	< 0.05	0.002	< 0.1	0.034	0.4	1.8	2.2	< 0.2	< 1	< 1
0624	N	1/15/1992	6,858.50	6.90	7.57	4267	525	348	197	2.8	539	2296	113	< 0.05	82	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.01	< 0.1	< 0.05	0.002	< 0.1	0.029	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	4/8/1992	6,858.30	6.90	7.73	4279	581	371	208	3.5	597	2276	118	< 0.05	83.2	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	0.002	< 0.1	0.034	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	7/8/1992	6,857.90	6.80	7.43	4323	581	360	254	4.3	432	2259	125	0.08	106	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	0.07	< 0.01	< 0.1	< 0.05	0.002	< 0.1	0.03	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	10/6/1992	6,857.50	7.00	7.56	4704	626	364	218	2.1	593	2304	112	< 0.05	120	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.02	< 0.1	< 0.05	0.006	< 0.1	0.048	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	1/7/1993	6,857.10	7.00	7.71	4698	587	348	211	3.9	586	2245	122	< 0.05	105	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.02	< 0.05	0.02	< 0.1	< 0.05	0.008	< 0.1	0.043	< 0.2	4.2	4.2	< 0.2	< 1	< 1
0624	N	4/7/1993	6,857.10	7.00	7.50	4111	553	307	230	15.9	581	2172	129	< 0.05	107	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.02	< 0.1	< 0.05	0.002	< 0.1	0.033	4.6	< 1	4.6	< 0.2	1.4	4.8
0624	N	7/14/1993	6,856.60	7.00	7.11	4803	645	361	211	2.4	748	2307	138	< 0.05	106	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.02	< 0.1	< 0.05	0.003	< 0.1	0.019	< 0.2	< 1	0	< 0.2	2.8	< 1
0624	N	10/7/1993	6,856.40	7.10	7.62	4371	602	326	188	1.4	700	2107	128	< 0.05	117	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.02	< 0.1	< 0.05	0.003	< 0.1	0.023	0.6	< 1	0.6	< 0.2	4.8	< 1
0624	N	1/6/1994	6,856.00	7.20	7.41	4425	618	345	200	2.2	694	2241	129	< 0.05	89.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.027	1.3	5.1	6.4	< 0.2	< 1	9.9
0624	N	4/12/1994	6,855.60	7.10	7.45	4779	623	344	197	1.7	625	2324	118	0.3	124	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.01	< 0.1	< 0.05	0.001	< 0.1	0.043	7.5	2.4	9.9	< 0.2	< 1	11.3
0624	N	7/21/1994	6,855.20	7.10	7.54	4592	674	356	203	2	649	2203	118	< 0.05	115	< 1	< 0.1	0.001	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	< 0.001	< 0.1	0.029	< 0.2	1.1	1.1	< 0.2	< 1	1.8
0624	N	10/5/1994	6,855.00	6.80	7.64	4815	661	391	212	3.8	843	2160	137	< 0.05	97.3	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	< 0.001	< 0.1	0.035	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	1/4/1995	6,854.70	6.90	7.63	4803	665	375	202	3.5	814	2303	137	0.27	92.8	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.033	0.6	1.3	1.9	< 0.2	< 1	2.7
0624	N	4/5/1995	6,854.40	7.00	7.44	4661	630	342	195	3	475	2383	155	0.27	101	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.037	3.9	1.6	5.5	< 0.2	2.1	6.5
0624	N	7/6/1995	6,854.40	7.10	7.63	4358	655	405	207	3.9	766	2201	157	0.1	93.5	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.01	< 0.1	< 0.05	0.002	< 0.1	0.0405	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	10/3/1995	6,853.80	7.00	7.83	4950	655	415	197	3.8	972	2247	154	0.18	94.3	< 1	< 0.1	0.002	< 0.01	< 0.01	< 0.01	< 0.05	0.01	< 0.1	< 0.05	0.013	< 0.1	0.0331	0.3	< 1	0.3	< 0.2	< 1	< 1
0624	N	1/3/1996	6,853.60	7.00	7.43	4553	610	392	203	4.8	1182	1879	123	< 0.05	97	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.01	< 0.1	< 0.05	0.007	< 0.1	0.032	0.6	1.3	1.9	0.6	< 1	< 1
0624	N	4/2/1996	6,853.20	6.80	7.92	4942	655	430	204	4.7	1048	2310	150	< 0.05	100	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.033	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	7/7/1996	6,852.90	6.60	7.45	4946	645	405	206	4.6	1158	2190	145	0.07	84.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.043	0.3	< 1	0.3	< 0.2	< 1	< 1
0624	N	10/1/1996	6,852.90	6.80	7.25	5050	666	430	204	4.6	1180	2179	161	< 0.05	93	< 1	< 0.1	0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.02	< 0.1	< 0.05	0.003	< 0.1	0.032	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	1/22/1997	6,852.60	6.70	7.69	4920	675	440	202	4.8	1070	2146	161	< 0.05	84.6	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.01	< 0.1	< 0.05	< 0.001	< 0.1	0.027	0.6	< 1	0.6	< 0.2	< 1	< 1
0624	N	4/8/1997	6,852.40	6.90	7.89	5000	683	427	195	3.8	1030	2227	169	0.06	103	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.02	< 0.1	< 0.05	0.014	< 0.1	0.036	0.8	< 1	0.8	< 0.2	< 1	< 1
0624	N	7/8/1997	6,852.00	7.10	7.54	5040	680	444	186	4.6	1060	2260	181	< 0.05	92.6	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.034	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	10/7/1997	6,852.50	6.50	7.66	5140	712	459	179	3.51	1310	2160	166	< 0.05	86.3	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.12	< 0.1	< 0.05	< 0.001	< 0.1	0.03	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	1/16/1998	6,852.40	7.00	7.78	5140	679	436	208	5.6	1300	2350	194	0.16	101	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.11	< 0.1	< 0.05	< 0.001	< 0.1	0.0379	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	4/7/1998	6,851.90	6.90	7.60	5190	691	442	197	4.4	1180	2400	153	< 0.05	98.7	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.039	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	7/7/1998	6,851.70	7.20	7.79	5050	679	435	206	4.4	1080	2400	174	< 0.05	92.2	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.0409	0.7	< 1	0.7	< 0.2	< 1	< 1
0624	N	10/6/1998	6,851.30	7.01	7.88	5210	708	464	216	6.2	1230	2220	175	< 0.05	101	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.03	< 0.1	< 0.05	0.001	< 0.1	0.0409	0.7	< 1	0.7	< 0.2	< 1	< 1
0624	N	1/5/1999	6,851.20	6.80	7.85	5140	659	423	188	5.3	1160	2030	172	0.18	94.2	< 1	< 0.1	< 0.001	< 0.01	0.006	< 0.01	< 0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.0395	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	4/6/1999	6,851.10	6.80	7.89	5150	692	451	188	5.4	1230	2000	180	0.08	94.5	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.0366	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	7/13/1999	6,850.77	6.70	7.85	5020	646	452	191	10.8	1070	2070	181	0.18	88.7	< 1	< 0.1	< 0.001	< 0.01	< 0.005	0.02	< 0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.0339	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	10/5/1999	6,851.80	6.78	7.59	4900	618	411	199	6.1	1350	1860	179	0.09	88.3	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.0366	0.5	< 1	0.5	< 0.2	< 1	< 1
0624	N	1/4/2000	6,851.20	6.80	7.76	4840	649	429	170	6.9	1160	2080	155	< 0.05	49.2	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	0.001	< 0.1	0.0443	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	5/9/2000	6,850.60	6.50	7.67	5130	652	438	207	6.3	1470	1970	177	< 0.05	93.6	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.0348	< 0.2	2	2	< 0.2	6.4	< 1
0624	N	7/17/2000	6,850.40	6.55	7.62	5170	697	456	194	6.46	1480	1790	184	< 0.05	85.1	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.0325	< 0.2	1.5	1.5	< 0.2	< 1	< 1
0624	N	10/9/2000	6,850.25	6.70	7.59	5090	606	412	185	7.6	1440	1530	147	0.1	98.5	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.01	< 0.1	< 0.05	< 0.001	< 0.1	0.031	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	1/8/2001	6,850.10	6.65	7.40	5100	707	464	173	6.9	1480	1810	177	< 0.05	104	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.032	0.4	< 1	0.4	< 0.2	< 1	< 1
0624	N	2/5/2001	6,850.10	6.72	7.31	5110	801	510	171	7.6	1480	2320	170	0.21	93.9	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.033	0.3	< 1	0.3	< 0.2	< 1	< 1
0624	N	3/5/2001	6,850.10	7.03	7.47	4740	690	457	148	8.1	1450	2190	154	< 0.05	101	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.0327	< 0.2	4	4	< 0.2	< 1	< 1
0624	N	4/10/2001	6,850.10	7.24	7.33	4910	791	497	238	7.3	1470	2250	176	< 0.05	103	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.031	0.3	< 1	0.3	< 0.2	< 1	< 1
0624	N	5/8/2001	6,849.90	6.62	7.54	5150	677	444	181	6.7	1450	1880	187	0.08	99.3	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.034	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	6/5/2001	6,849.90	6.62	7.02	5050	683	454	182	6.5	1470	2000	182	0.11	101	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	0.009	< 0.1	0.065	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	7/10/2001	6,849.90	6.62	7.40	5290	726	488	198	6.1	1480	2050	172	< 0.05	101	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.0329	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	8/7/2001	6,849.87	6.59	7.40	5230	660	450	200	6	1470	1900	180	0.05	88	< 1	0.13	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.04	0.4	2.3	2.7	< 0.2	< 1	< 1
0624	N	9/11/2001	6,850.30	6.52	7.30	5200	670	450	191	6.8	1490	1930	217	0.05	118	< 1	0.11	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.03	< 0.2	2.9	2.9	< 0.2	< 1	< 1
0624	N	10/2/2001	6,850.30	6.65	7.80	5210	660	450	192	7	1500	1850	240	< 0.05	100	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.0319	0.2	< 1	0.2	< 0.2	< 1	< 1
0624	N	11/6/2001	6,850.15	6.60	7.20	5210	731	475	196	7.4	1490	2100	232	0.05	104	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.0288	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	12/4/2001	6,850.20	6.62	7.30	5250	673	433	172	6.4	1500	1750	197	< 0.05	101	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.0295	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	1/8/2002	6,850.10	6.95	7.30	5190	787	481	201	7	1490	2270	208	< 0.05	91.5	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.0301	0.4	< 1	0.4	< 0.2	< 1	< 1

TABLE A.1

Southwest Alluvium Data Summary, 1989-2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
0624	N	2/5/2002	6,850.10	6.78	7.30	5190	762	461	193	7.8	1470	2120	219	0.06	90.5	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.0212	0.4	2	2.4	< 0.2	< 1	< 1
0624	Dup	2/5/2002	no data	6.78	7.20	5210	762	460	214	6.8	1470	2140	205	0.06	88.3	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.0218	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	3/5/2002	6,850.10	6.61	7.20	5170	726	463	228	6.8	1530	2190	207	0.06	95.1	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.0351	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	Dup	3/5/2002	no data	6.57	7.50	5130	714	456	223	6.6	1530	2170	193	0.06	97.2	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.04	< 0.1	< 0.05	< 0.001	< 0.1	0.037	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	4/2/2002	6,850.16	6.54	7.45	5270	748	464	225	8.3	1500	2180	203	0.06	95.5	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.04	< 0.1	< 0.05	< 0.001	< 0.1	0.0326	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	Dup	4/2/2002	no data	6.53	7.48	5210	741	459	220	8	1500	2130	206	0.05	95.7	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.0338	0.4	< 1	0.4	< 0.2	< 1	1.5
0624	N	5/7/2002	6,850.08	6.59	7.61	5220	719	448	226	7.4	1480	2100	186	0.13	104	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.0355	0.5	< 1	0.5	< 0.2	< 1	< 1
0624	N	6/4/2002	6,850.10	6.52	7.66	5220	720	450	201	6.4	1480	1830	181	< 0.05	96.3	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.0333	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	Dup	6/4/2002	no data	6.51	7.68	5210	711	444	208	6	1480	1850	174	0.08	92.1	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.0314	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	7/9/2002	6,849.95	6.67	7.42	5300	713	463	223	7.3	1500	2150	200	0.05	92.4	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.036	0.3	< 1	0.3	< 0.2	< 1	< 1
0624	Dup	7/9/2002	no data	6.59	7.41	5320	709	460	225	7.8	1500	2110	201	0.05	91.4	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.0363	0.4	< 1	0.4	< 0.2	< 1	< 1
0624	N	10/8/2002	6,849.90	6.67	7.25	5150	659	425	208	6.2	1490	1810	173	0.08	97.1	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.0262	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	Dup	10/8/2002	no data	6.47	7.40	5160	663	427	207	6.1	1480	1800	167	0.06	96.6	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.0265	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	1/7/2003	6,849.61	6.74	7.21	5210	733	480	242	7.4	1490	2250	175	0.19	92	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.04	< 0.1	< 0.05	< 0.001	< 0.1	0.0348	< 0.2	< 1	0	< 0.2	< 1	< 1.0
0624	Dup	1/7/2003	no data	no data	7.24	5190	726	476	120	7.8	1500	2220	118	0.15	90	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.04	< 0.1	< 0.05	< 0.001	< 0.1	0.0409	< 0.2	< 1	0	< 0.2	< 1	< 1.6
0624	N	4/8/2003	6,849.72	6.49	6.85	5250	685	422	230	8.3	1450	1900	184	0.11	102	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.04	< 0.1	< 0.05	< 0.001	< 0.1	0.0336	0.5	< 1	0.5	< 0.2	< 1	< 1.0
0624	N	7/8/2003	6,849.70	6.36	7.41	4540	646	413	198	8.5	1480	2040	158	0.07	100	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.0289	< 0.2	< 1	0	< 0.2	< 1	< 1.0
0624	Dup	7/8/2003	no data	no data	7.38	5290	657	418	208	7.8	1470	2080	160	0.5	93	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.0277	< 0.2	< 1	0	< 0.2	< 1	< 1.0
0624	N	10/7/2003	6,849.72	6.40	7.76	5260	725	469	239	6.4	1430	2240	178	0.2	90	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.0333	< 0.2	< 1	0	< 0.2	< 1	< 1.0
0624	Dup	10/7/2003	no data	no data	7.80	5290	723	467	240	6.6	1460	2210	178	0.17	92	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.0334	< 0.2	< 1	0	< 0.2	< 1	< 1.0
0624	N	1/6/2004	6,849.60	6.57	7.71	5180	690	445	212	7	1440	2140	197	0.11	87.9 D	< 1.0	0.2	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.06	< 0.1	< 0.05	< 0.001	< 0.1	0.0296 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
0624	Dup	1/6/2004	no data	no data	7.69	5170	698	452	214	6.4	1440	2190	172	0.08	100 D	< 1.0	0.2	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.0284 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
0624	N	4/6/2004	6,849.67	6.76	6.87	5220	695	448	190	6.4	1460	2100 D	147	0.13	92.2 D	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.045	< 0.1	< 0.05	< 0.001	< 0.1	0.0288 D	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	Dup	4/6/2004	no data	no data	6.81	5240	693	448	212	7.1	1460	2120 D	173	0.14	92.8 D	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.0314 D	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	7/13/2004	6,849.52	6.41	6.87	5320	715	442	249	6.8	1440	2120 D	172	0.13	93.1 D	< 1.0	7.7	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.0305 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
0624	Dup	7/13/2004	no data	no data	6.86	5310	714	441	245	7.2	1440	2130 D	175	0.14	92.0 D	< 1.0	1.8	< 0.001	< 0.01	< 0.005	0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.0303 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
0624	N	10/5/2004	6,849.34	6.46	7.07	5520	666 D	422 D	237	6.4	1380	2020 D	172	< 0.05	85.9 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.06	< 0.1	< 0.05	< 0.001	< 0.1	0.0321 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
0624	Dup	10/5/2004	no data	no data	7.05	5380	664 D	420 D	227	6.1	1390	2030 D	163	< 0.05	83.2 D	< 1.0	< 0.1	< 0.001	< 0.01	0.005	< 0.01	< 0.05	0.06	< 0.1	< 0.05	< 0.001	< 0.1	0.0338 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
0624	N	1/4/2005	6,849.37	6.87	6.99	5240	702 D	435 D	240	6.3	1360	2030 D	166	0.05	86 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.06	< 0.1	< 0.05	< 0.001	< 0.1	0.0343	0.4	< 1.0	0.4	< 0.2	< 1.0	2.2
0624	Dup	1/4/2005	no data	no data	7.06	5240	692 D	430 D	234	6.3	1420	2000 D	162	0.05	86 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.06	< 0.1	< 0.05	< 0.001	< 0.1	0.0324	0.3	< 1.0	0.3	< 0.2	< 1.0	< 1.0
0624	N	4/5/2005	6,849.37	6.65	7.30	5000	635	394	238	5.6	1400	1930	159	< 0.05	73	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.06	< 0.1	< 0.05	< 0.001	< 0.1	0.033	0.7	< 1.0	0.7	< 0.2	< 1.0	< 1.0
0624	Dup	4/5/2005	no data	no data	7.29	4970	599	382	237	4.5	1400	2060	169	< 0.05	70	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.06	< 0.1	< 0.05	< 0.001	< 0.1	0.0325	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
0624	N	7/12/2005	6,849.17	6.55	7.29	5120	673 D	434 D	246	5.9	1340	2100 D	176	0.09	70 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.07	< 0.1	< 0.05	< 0.001	< 0.1	0.0304	0.3	< 1.0	0.3	< 0.2	< 1.0	< 1.0
0624	Dup	7/12/2005	no data	no data	7.32	5010	694 D	424 D	244	5.9	1340	2100 D	177	< 0.05	81 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.07	< 0.1	< 0.05	< 0.001	< 0.1	0.0307	0.3	< 1.0	0.3	< 0.2	< 1.0	< 1.0
0624	N	10/4/2005	6,849.02	6.56	7.21	5130	693 D	436 D	241	6.2	1370	2170 D	184	< 0.05	75 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.08	< 0.1	< 0.05	< 0.001	< 0.1	0.0316	< 0.2	2.9	2.9	< 0.2	< 1.0	< 1.0
0624	Dup	10/4/2005	no data	no data	7.18	5070	696 D	434 D	242	6.3	1370	2160 D	188	< 0.05	75 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.08	< 0.1	< 0.05	< 0.001	< 0.1	0.0318	< 0.2	1.7	1.7	< 0.2	< 1.0	1.4
0624	N	1/10/2006	6,848.93	6.71	7.64	4890	631	392	236	5.1	1340	1950 D	161	< 0.05	82 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.07	< 0.1	< 0.05	< 0.001	< 0.1	0.0363	0.4	1.9	2.3	< 0.2	< 1.0	< 1.0
0624	Dup	1/10/2006	no data	no data	7.33	5020	660	409	247	5.2	1420	2050 D	164	< 0.05	85 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.07	< 0.1	< 0.05	< 0.001	< 0.1	0.0379	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
0624	N	4/4/2006	6,848.92	6.47	7.21	5070	730 D	463 D	230	6.4	1350	2180 D	184	< 0.05	86 D	< 1.0	0.2	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.08	< 0.1	< 0.05	< 0.001	< 0.1	0.0338 D	< 0.2	1.6	1.6	< 0.2	< 1.0	< 1.0
0624	Dup	4/4/2006	no data	no data	7.20	5080	711 D	452 D	233	6.5	1340	2140 D	186	< 0.05	86 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.08	< 0.1	< 0.05	< 0.001	< 0.1	0.0286 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
0624	N	7/18/2006	6,848.92	6.48	6.89	5030	713 D	443 D	260	6.9	1360	2300 D	178	0.05	82 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.09	< 0.1	< 0.05	< 0.001	< 0.1	0.0326	0.3	2.8	3.1	< 0.2	< 1.0	< 1.0
0624	Dup	7/18/2006	no data	no data	6.91	5010	698 D	434 D	258	6.3	1350	2270 D	173	< 0.05	79 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.09	< 0.1	< 0.05	< 0.001	< 0.1	0.0324	0.6	2.9	3.5	< 0.2	< 1.0	< 1.0
0624	N	10/3/2006	6,848.93	6.48	6.72	4920	682 D	419 D	231	6.2	1100	2100 D	144	0.08	76 D	< 0.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.09	< 0.1	< 0.05	< 0.001	< 0.1	0.0328	0.4	< 1	0.4	< 0.2	< 1	< 1
0624	Dup	10/3/2006	no data	no data	6.74	4970	672 D	411 D	224	6.2	1070	2070 D	134	0.08	77 D	< 0.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.09	< 0.1	< 0.05	< 0.001	< 0.1	0.032	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	1/9/2007	6,848.88	6.62	6.82	5130	704 D	437 D	226	6.9	1360	2250 D	168	<0.05	74 D	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.09	<0.1	<0.05	<0.001	<0.1	0.0313	<0.2	<1	0	<0.2	<1	<1
0624	Dup	1/9/2007	no data	6.61	6.85	5130	680 D	421 D	228	6.7	1360	2130 D	169	0.05	77 D	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.09	<0.1	<0.05	<0.001	<0.1	0.0314	0.4	<1	0.4	<0.2	<1	<1
0624	N	4/10/2007	6,849.02	6.65	6.75	5090	693 D	427 D	226	8.1	1380	2150 D	182	<0.05	82 D	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.09	<0.1	<0.05	<0.001	<0.1	0.0308	<0.2	<1	0	<0.2	<1	<1
0624	Dup	4/10/2007	no data	6.74	6.88	5070	689 D	425 D	222	7.7	1400	2140 D	169	<0.05	83 D	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.09	<0.1	<0.05	<0.001	<0.1	0.0336	<0.2	<1	0	<0.2	<1	<1
0624	N	7/10/2007	6,848.67	6.50	6.87	5020	702 D	433 D	245	6.2	1450	2230 D	154	0.08	77 D	<0.5	<0.1	0.009	<0.01	<0.005	<0.01	<0.05	0.08	<0.1	<0.05	<0.001	<0.1	0.0339	<0.2	<1	0	<0.2	<1	<1
0624	Dup	7/10/2007	no data	6.47	6.84	4930	688 D	435 D	243	6.1	1450	2250 D	162	0.08	77 D	<0.5	<0.1	0.009	<0.01	<0.005	<0.01	<0.05	0.06	<0.1	<0.05	<0.001	<0.1	0.033	<0.2	<1	0	<0.2	<1	<1
0624	N	10/2/2007	6,848.67	6.50	6.91	5030	626 D	385 D	246 D	6.9	1430	1990 D	188 D	<0.05	74 D	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.1	<0.1	<0.05	<0.001	<0.1	0.0341	<0.2	<1	0	<0.2	<1	<1
0624	N	1/15/2008	6,848.62	6.53	6.69	5110	650 D	396 D	246 D	7.1	1390	2000 D	205 D	< 0.05	68 D	< 0.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.09	< 0.1	< 0.05	< 0.001	< 0.1	0.0307	< 0.2	< 1	0	< 0.2	< 1	< 1
0624	N	4/8/2008	6,849.12	6.47	6.90	4830	708 D	442 D	280 D	8.2 D	1320	2240 D	174	< 0.05	108 D	< 0.50	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.1	< 0.1	< 0.05	< 0.001	< 0.1	0.0325	0.2	-0.04 U	0.16	0.5	0 U	0.9 U
0624	N	7/8/2008	6,848.67	6.33	6.82	4700	657	396	233 D	5	1410	2170 D	184	< 0.05	74.9 D	< 0.5	< 0.1	< 0.003	< 0.01	< 0.005	< 0.01	< 0.05	0.04	< 0.1	< 0.05	< 0.001	< 0.1	0.0286	0.36	0.23 U	0.59	-0.1 U	1.1 U	0.4 U
0624	N	10/7/2008	6,848.42	6.46	6.88	4920	662	403	248 D	6	1390	2380 D	178	< 0.1	94.9 D	< 0.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.11	< 0.1	< 0.05	< 0.001	< 0.1	0.0306	-0.06 U	-0.2 U	-0.26	0 U	0.3 U	0.9
0624	N	1/13/2009	6,848.27	6.50	6.90	5180	614	383	257	6	1420	1870 D	169	<0.05	111 D	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.12	<0.1	<0.05	<0.001	<0.1	0.0322	0.05 U	-0.1 U	-0.05	-0.1 U	-1 U	1.7
0624	N	4/7/2009	6,848.22	6.48	6.64	5080	650 D	413 D	271 D	6	1460	2190 D	191	<0.05	77.4 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.1	<0.1	<0.05	<0.001	<0.1	0.0289	-0.05 U	0.75 U	0.75	0.06 U	-1 U	0.2 U
0624	N	7/7/2009	6,848.07	6.38	6.72	5080	692 D	405	253 D	6	1440	2560 D	187	<0.05	71 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.13	<0.1	<0.05	<0.001	<0.1	0.031	0.32	0.75 U	1.07	0.1 U	-0.9 U	1.4
0624	N	10/5/2009	6,847.77	6.44	7.17	4950	643 D	396	245 D	6	1490	1960 D	187	<0.05	75 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.15	<0.1	<0.05	<0.001	<0.1	0.0315	0.56	0.79 U	1.35	0.08 U	2.4 U	-0.09 U

TABLE A.1
Southwest Alluvium Data Summary, 1989-2019
United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

[redacted]cation ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
0624	N	1/5/2010	6,847.57	6.55	7.11	5230 D	693 D	404	255 D	6	1520	2370 D	194	<0.05	76 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.12	<0.1	<0.05	<0.001	<0.1	0.0307	0.08 U	1.5	1.58	0.1 U	-1 U	0.03 U
0624	N	4/6/2010	6,847.72	6.58	6.72	5220 D	725 D	433	287 D	6	1600	2230 D	198	<0.05	77 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.13	<0.1	<0.05	<0.001	<0.1	0.0311	0.23	0.09 U	0.32	0.02 U	2.3 U	0.6
0624	N	7/13/2010	6,847.52	6.42	7.08	5190 D	712 D	417	273 D	6	1570	2200 D	194 D	<0.05	70 D	<0.50	<0.1	0.002	<0.01	<0.005	<0.01	<0.05	0.16	<0.1	<0.05	<0.001	<0.1	0.0358	0.2	0.47 U	0.67	0.05 U	-1 U	0.3 U
0624	N	10/5/2010	6,847.37	6.53	7.60	5340 D	666	395	271	6	1570	2210 D	195 D	0.07	74 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.17	<0.1	<0.05	<0.001	<0.1	0.0355	-0.04 U	1.4	1.36	0.03 U	1.7	0.2 U
0624	N	1/4/2011	6,847.22	6.48	7.01	4970 D	720	427	273	6	1510	2190 D	206 D	<0.05	64 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.16	<0.1	<0.05	<0.001	<0.1	0.0345	0.06 U	0.71 U	0.77	0.02 U	0.6 U	1.1
0624	N	4/4/2011	6,847.10	6.62	6.81	5170 D	697	412	292	6	1520	2170 D	202 D	<0.05	69 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.19	<0.1	<0.05	<0.001	<0.1	0.0327	0.05 U	0.95 U	1	0.02 U	-0.3 U	-0.04 U
0624	N	7/12/2011	6,846.97	6.72	7.15	5100 D	691	419	282	6	1520	2180 D	200 D	<0.1	78 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.25	<0.1	<0.05	<0.001	<0.1	0.0351	0.05 U	0.95 U	1	0.02 U	-0.04 U	1
0624	N	10/4/2011	6,846.89	6.68	7.49	4990 D	694	408	279	6	1420	2240 D	208 D	<0.1	74 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.19	<0.1	<0.05	<0.001	<0.1	0.0308	0.12 U	0.71 U	0.83	0.008 U	0.04 U	0.4 U
0624	N	1/3/2012	NA	6.68	6.75 H	5110 D	662	400	269	7	1400	2140 D	200 D	<0.05	75 D	2.47	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.17	<0.1	<0.05	<0.001	<0.1	0.0347	0.46	0.88 U	2.22	0.01 U	0.07 U	0.5
0624	N	4/3/2012	6,846.57	6.74	6.59 H	5110 D	696	400	267	6	1510	2170 D	203 D	<0.05	76 D	<0.50	<0.1	<0.01	<0.01	<0.005	<0.01	<0.05	0.19	<0.1	<0.05	<0.001	<0.1	0.0355	0.39	1.4	3.19	0.01 U	-0.4 U	0.003 U
0624	N	7/10/2012	6,846.37	6.50	6.72 H	5250	671	419	261	5	1500	2120 D	198 D	0.14	78 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.23	<0.1	<0.05	<0.001	<0.1	0.0319	0.42	-0.4 U	0.42	0.2 U	0.04 U	0.2 U
0624	N	10/9/2012	6,846.27	6.70	6.66 H	5110	728	418	285 D	6	1550	2180 D	212 D	<0.05	72 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.22	<0.1	<0.05	<0.001	<0.1	0.0351	0.24	-0.3 U	0.24	0.05 U	0.7 U	0.9
0624	N	1/9/2013	6,846.15	6.62	6.61 H	5080	686	426	298 D	6	1540	2160 D	201 D	<0.05	77 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.21	<0.1	<0.05	<0.001	<0.1	0.0367	0.35	0.38 U	0.35	0.03 U	0.9 U	0.6 U
0624	N	4/2/2013	6,846.06	6.58	6.66 H	5210	705	427	295	6	1570	2240 D	216 D	<0.05	77 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.18	<0.1	<0.05	<0.001	<0.1	0.0377	0.17	0.71 U	0.17	0.04 U	-0.2 U	0.6
0624	N	7/9/2013	6,845.78	6.49	6.76 H	5260	683	419	282	6	1570	2110 D	197 D	<0.05	71 D	<0.50	2.6	<0.001	<0.001	<0.005	<0.01	0.002	0.22	<0.1	<0.05	<0.001	<0.1	0.0376	0.2	0.18 U	0.2	0.05 U	1.8	0.1 U
0624	N	10/1/2013	6,846.60	6.57	6.61 H	5190	678	417	287	6	1600	2180 D	204 D	<0.05	71 D	<0.50	0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.17	<0.1	<0.05	<0.001	<0.1	0.0382	0.42	0.80 U	0.42	0.07 U	0.4 U	0.1 U
0624	N	1/7/2014	6,846.10	6.82	6.59	5220	677	412	286	6	1580	2150	205	<0.05	76	<0.50	0.3	<0.001	<0.001	<0.005	<0.01	<0.001	0.17	<0.1	<0.05	<0.001	<0.1	0.0386	0.19	0.95 U	0.19	0.005 U	0.5 U	0.4 U
0624	N	4/1/2014	6,845.89	6.72	6.70 H	5220	711	444	304 D	6	1590	2350 D	209 D	<0.05	68 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.15	<0.1	<0.05	<0.001	<0.1	0.0421	0.25	0.89 U	0.25	0.009 U	1.3	0.1 U
0624	N	7/8/2014	6,845.54	6.63	6.61 H	5220	712	444	312 D	6	1600	2180 D	204 D	<0.05	72 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.16	<0.1	<0.05	<0.001	<0.1	0.0408	0.35	2.3	2.65	-0.001 U	0.04 U	0.6 U
0624	N	10/7/2014	6,845.81	6.70	6.63 H	5270	684	417	289	6	1620	2220 D	210 D	<0.05	68 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.13	<0.1	<0.05	<0.001	<0.1	0.0385	0.31	1.2 U	0.31	0.008 U	-0.1 U	0.2 U
0624	N	1/6/2015	6,845.65	6.74	6.56 H	5140	651	411	286	6	1540	2280 D	235 D	<0.05	73 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.12	<0.1	<0.05	<0.001	<0.1	0.0392	0.32	0.64 U	0.32	0.03 U	0.3 U	1.3 U
0624	N	4/7/2015	6,845.33	6.58	6.65 H	5250	694	418	298	6	1610	2150 D	214 D	<0.05	73 D	<0.5	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.13	<0.1	<0.05	<0.001	<0.1	0.0361	0.47	0.99 U	0.47	0 U	-0.5 U	1 U
0624	N	7/7/2015	6,845.14	6.39	6.59 H	5330	682	401	285	8	1670	2260 D	215 D	0.07	71 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.13	<0.1	<0.05	<0.001	<0.1	0.0379	0.26	0.76 U	0.26	0.02 U	-0.3 U	0.8 U
0624	N	10/5/2015	6,845.06	6.74	6.61 H	5250	677	411	294	6	1520	2470 D	244 D	<0.05	67 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.13	<0.1	<0.05	<0.001	<0.1	0.0317	0.34	0.31 U	0.34	0.01 U	0.5 U	2.7
0624	N	1/4/2016	6,844.96	6.73	6.61 H	5250	687	416	292	6	1640	2290 D	217 D	<0.05	73 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.11	<0.1	<0.05	<0.001	<0.1	0.0394	0.48	0.94 U	0.48	0.05 U	0.03 U	1.7
0624	N	4/4/2016	6,844.75	6.50	6.77 H	5270	698	420	310	6	1590	2220 D	211 D	<0.05	72 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.1	<0.1	<0.05	<0.001	<0.1	0.0378	0.37	1.8	2.17	0.05 U	0.04 U	0.08 U
[redacted]624	N	7/11/2016	6,844.49	6.56	6.60 H	5240 D	638	416	296	6	1590	2170 D	221 D	<0.05	77 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.08	<0.1	<0.05	<0.001	<0.1	0.0339	0.26	2.2	2.46	0.02 U	-0.4 U	0.6 U
[redacted]624	N	10/3/2016	6,844.30	6.72	6.60 H	5260 H	664	423	303	6	1610	2290 D	216 D	<0.05	75 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.04	<0.1	<0.05	<0.001	<0.1	0.0323	0.29	0.41 U	0.29	0.4	0.3 U	2.3
0624	N	1/10/2017	6,844.05	6.63	6.70 H	5280 D	640	427	309	6	1650	2310 D	218 D	<0.05	80 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.12	<0.1	<0.05	<0.001	<0.1	0.0367	0.27	0.88 U	0.27	0.02 U	0.3 U	0.5 U
0624	N	4/3/2017	6,843.96	6.53	6.60 H	5180 D	646	382	281 D	6	1640	2240 D	211 D	<0.05	78 D	<0.50	<0.1	0.001	<0.001	<0.005	<0.01	<0.001	0.12	<0.1	<0.05	<0.001	<0.1	0.0363	0.23	0.86 U	0.23	0.02 U	-0.5 U	0.8 U
0624	N	7/10/2017	6,843.65	6.55	6.60 H	5210 D	728	443	326 D	6	1630	2130 D	210 D	<0.05	71.0 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.13	<0.1	<0.05	<0.001	<0.1	0.0397	0.4	-0.3 U	0.4	0.03 U	0.8 U	0.4 U
0624	N	10/2/2017	6,843.40	6.57	6.63 H	5170 D	689	434	306 D	6	1670	2100 D	212 D	<0.05	71.5 D	<0.50	0.2	<0.001	<0.001	<0.005	<0.01	<0.001	0.14	<0.1	<0.05	<0.001	<0.1	0.042	0.2	1.1 U	0	0.05 U	0.05 U	0.2 U
0624	N	1/8/2018	6,843.22	6.74	6.60 H	5210 D	706	426	340 D	6	1540	2360 D	221 D	<0.05	71.5 D	<0.50	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	0.124 D	<0.001	<0.005	<0.001	<0.01	0.0422	0.3	-0.5 U	0.3	0.01 U	-0.4 U	0.6
0624	N	4/2/2018	6,843.17	6.56	6.59 H	5350 D	765 D	387	301 D	6	1570	2370 D	228 D	<0.05	77 D	<0.50	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	0.116	<0.001	<0.005	<0.001	<0.01	0.041	0.3	0.6 U	0.3	0.1 U	-0.8 U	0.7
0624	N	7/10/2018	6,842.69	6.51	6.63 H	5500 D	683	398	290	6 D	1600	2190 D	213 D	<0.05	79.5 D	<0.50	0.36	<0.001	<0.001	<0.001	<0.005	<0.001	0.176	<0.001	<0.005	<0.001	<0.01	0.0402	0.4	2.7	3.1	0.08 U	1.1 U	0.9
0624	N	10/2/2018	6,842.36	6.59	6.64 H	5360 D	697	428	322 D	6	1600	2310 D	217 D	<0.05	75.0 D	<0.50	0.3	<0.001	<0.001	<0.001	<0.005	<0.001	0.168	<0.001	<0.005	<0.001	<0.01	0.0407	0.3	2.7	3	0.01 U	0.5 U	0.9
0624	N	1/8/2019	6,842.33	6.58	6.66 H	5340 D	729	447	352	7	1620	2320 D	212 D	<0.05	68.5 D	<0.50	0.21	no data	<0.001	<0.001	<0.005	<0.001	0.132	<0.001	<0.005	no data	<0.01	0.0409	0.1	-0.09 U	0.1	0.06 U	0.5	0.2
0624	N	4/9/2019	6,842.34	6.55	6.76 H	5360 D	699	437	333	6	1690	2340 D	222 D	<0.05	69.2 D	<0.50	<0.03	0.002	<0.001	<0.001	<0.005	<0.001	0.124	<0.001	<0.005	<0.001	<0.01	0.0393	0.2	0.3 U	0.5	-0.06 U	1.2	0.6
0624	N	7/30/2019	6,841.87	6.54	6.67 H	5390 DH	688	422	318	7	1640	2310 D	222 D	<0.05	72 D	<0.50	0.27 D	<0.001	<0.001	<0.001	<0.005	<0.001	0.158 D	<0.001	<0.005	<0.001	<0.01	0.0416 D	0.3	2.5	2.8	-0.008 U	0.5 U	0.3 U
0624	N	10/11/2019	6,841.45	6.73	6.66 H	5280 DH	605	438	332	7	1620	2340 D	221 D	<0.2 D	70.5 D	<0.50	0.27	<0.001	<0.001	<0.001	<0.005	<0.001	0.11 D	<0.001	<0.005	<0.002 D	<0.01	0.037 D	0.5	-1 U	0.5	0.003	0.2 U	1.1
0627	N	7/20/1989	6,846.40	7.10	6.95	4509	554	304	382	3.1	622	2429	36.7	0.06	103	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.02	< 0.05	0.01	< 0.1	< 0.05	< 0.001	< 0.1	0.0143	0.9	< 1	0.9	2.5	2.2	2.7
0627	N	10/16/1989	6,846.80	6.90	7.36	4512	539	290	359	3.8	659	2151	36.6	0.12	112	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.03	< 0.1	< 0.05	0.002	< 0.1	0.0181	0.6	< 1	0.6	3.3	1.1	3.8
0627	N	1/4/1990	6,846.70	6.80	7.24	4446	571	275	351	7.8	656	2277	39.7	0.07	113	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.014	2	< 1	2	< 0.2	2.4	3.4
0627	N	4/3/1990	6,846.40	6.80	7.32	4492	590	290	352	3.2	698	2168	40.1	0.09	90	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.06	< 0.1	< 0.05	0.001	< 0.1	0.015	0.4	< 1	0.4	< 0.2	< 1	1.1
0627	N	7/2/1990	6,846.20	6.70	7.34	4750	613	322	325	4.5	693	2265	41.5	< 0.05	109	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.0175	0.3	< 1	0.3	< 0.2	1.9	< 1
0627	N	10/2/1990	6,846.20	6.80	7.60	4551	509	270	342	2.8	644	2404	41.6	< 0.05	78	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.014	0.2	< 1	0.2	< 0.2	< 1	< 1
0627	N	1/15/1991	6,846.20	6.80	7.77	4537	587	309	393	5.9	617	2480	49	< 0.05	118	< 1	0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.0176	< 0.2	< 1	0	< 0.2	< 1	< 1
0627	N	4/2/1991	6,846.20	6.80	7.70	4623	533	263	331	2.7	595	2407	45.9	< 0.05	94.8	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.049	1	3.8	4.8	< 0.2	< 1	1
0627	N	7/16/1991	6,845.90	6.80	7.44	4454	525	249	335	2.8	532	2537	45.4	0.36	97.2	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.014	< 0.2	2.8	2.8	< 0.2	< 1	< 1
0627	N	10/14/1991	6,845.60	6.70	7.37	4539	448	221	342	2.7	622	2161	55.7	< 0.05	104	< 1	< 0.1	0.001	< 0.01	< 0.01	0.01	< 0.05	0.05	< 0.1	< 0.05	0.002	< 0.1	0.02	< 0.2	1.5	1.5	< 0.2	< 1	< 1
0627	N	1/14/1992	6,845.40	6.60	7.12	4614	490	246	342	2.8	619	2317	54.7	< 0.05	101	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.07	< 0.1	< 0.05	0.002	< 0.1	0.017	0.9	1.2	2.1	< 0.2	< 1	< 1
0627	N	4/9/1992	6,845.10	6.60	7.91	4671	543	283	424	3.2	605	2346	52.3	< 0.05	68.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.03	< 0.1	< 0.05	0.003	< 0.1	0.019	< 0.2	2.9	2.9	< 0.2	1.2	< 1
0627	N	7/7/1992	6,844.90	6.50	8.00	4811	585	280	468	4.2	588	2403	59.2	0.13	108	< 1	< 0.1	< 0.001	< 0.1	< 0.01	< 0.01	< 0.05	0.05	< 0.1	< 0.05	0.001	< 0.1	0.02	0.7	< 1	0.7	< 0.2	< 1	< 1
0627	N	10/7/1992	6,844.60	6.80	7.45	4696	563	257	484	5	593	2402	56.3	< 0.05	125	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.06	< 0.1	< 0.05	0.003	< 0.1	0.025	0.7	2.1	2.8	< 0.2	1.7	< 1
0627	N	1/7/1993	6,844.40	6.80	7.88	4615	556	264	408	2.8	576	2324	57.4	< 0.05	116	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.06	< 0.1	< 0.05	0.014	< 0.1	0.018	0.5	1.5	2	< 0.2	< 1	< 1
0627	N	4/7/1993	6,844.30	6.80	7.59	4751	546	228	448	2.3	553	2341	61	< 0.05	100	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.08	< 0.1	< 0.05	0.004	< 0.1	0.033	< 0.2	< 1	0	< 0.2	1.2	< 1
0627	N	7/14/1993	6,843.80	6.90	7.21	5045	645	255	512	2.6	570	2476	72.5	< 0.05	99.3	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.08	< 0.1	< 0.05	0.018	< 0.1	0.016	0.6	2.3	2.9	< 0.2	< 1	< 1
0627	N	10/7/1993	6,843.60	6.90	7.57	5187	568	239	453	2.3	532	2548	62.4	0.05	133	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.02	< 0.05	0.08	< 0.1	< 0.05	0.009	< 0.1	0.012	0.6	< 1	0.6	< 0.2	< 1	< 1
[redacted]627	N	1/6/1994	6,843.40	6.90	7.51	4941	563	246	474	2.6	512	2693	63.1	< 0.05	61	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.08	< 0.1	< 0.05	0.003	< 0.1	0.015	0.9	< 1	0.9	< 0.2	< 1	< 1

TABLE A.1

Southwest Alluvium Data Summary, 1989-2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
0627	N	4/13/1994	6,843.20	7.00	7.15	4787	564	242	486	2.6	510	2428	58.5	0.12	107	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.09	< 0.1	< 0.05	0.002	< 0.1	0.015	0.8	< 1	0.8	< 0.2	3.2	< 1
0627	N	7/21/1994	6,842.90	6.90	7.53	4899	620	259	455	2.9	529	2908	54.6	< 0.05	108	< 1	< 0.1	0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.09	< 0.1	< 0.05	0.003	< 0.1	0.017	0.8	2.4	3.2	< 0.2	< 1	4.6
0627	N	10/5/1994	6,842.90	6.90	7.86	5024	610	282	535	3.6	549	2719	62.6	< 0.05	137	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.08	< 0.1	< 0.05	0.001	< 0.1	0.016	0.4	< 1	0.4	< 0.2	< 1	< 1
0627	N	1/5/1995	6,842.60	6.90	7.49	5292	634	280	530	4.2	540	2650	58.9	0.15	105	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.09	< 0.1	< 0.05	< 0.001	< 0.1	0.016	0.3	< 1	0.3	< 0.2	< 1	< 1
0627	N	4/5/1995	6,842.50	6.90	7.22	5324	540	275	505	3.9	542	2682	66	0.24	125	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.07	< 0.1	< 0.05	< 0.001	< 0.1	0.016	1.2	< 1	1.2	< 0.2	1.4	1.4
0627	N	7/6/1995	6,842.00	6.90	7.91	5112	585	315	490	3.6	560	2555	61	< 0.05	90.5	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.07	< 0.1	< 0.05	0.003	< 0.1	0.0205	0.8	< 1	0.8	0.3	< 1	1.4
0627	N	10/3/1995	6,841.80	6.90	7.65	5241	580	280	535	3.9	544	2760	58	0.48	126	< 1	< 0.1	0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.09	< 0.1	< 0.05	0.019	< 0.1	0.0168	< 0.2	< 1	0	< 0.2	1.7	2
0627	N	1/3/1996	6,841.70	7.10	7.52	5293	640	300	531	3.6	542	2995	60	< 0.05	131	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.07	< 0.1	< 0.05	0.001	< 0.1	0.018	0.7	< 1	0.7	1.2	2.4	1.2
0627	N	4/2/1996	6,841.50	7.10	8.06	5230	570	287	530	3.6	558	2740	65.1	< 0.05	129	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.07	< 0.1	< 0.05	< 0.001	< 0.1	0.019	0.5	< 1	0.5	< 0.2	< 1	< 1
0627	N	7/7/1996	6,841.20	6.80	7.56	5403	585	280	570	4.1	534	2725	64	0.13	113	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.13	< 0.1	< 0.05	< 0.001	< 0.1	0.024	0.3	< 1	0.3	< 0.2	< 1	< 1
0627	N	10/1/1996	6,841.00	6.80	7.23	4980	592	277	470	3.5	575	2468	54	< 0.05	119	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.09	< 0.1	< 0.05	0.002	< 0.1	0.024	0.5	< 1	0.5	< 0.2	< 1	< 1
0627	N	1/22/1997	6,840.80	6.80	7.85	5020	595	290	503	3.7	577	2673	63.3	< 0.05	121	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.11	< 0.1	< 0.05	< 0.001	< 0.1	0.018	1	< 1	1	< 0.2	< 1	< 1
0627	N	4/8/1997	6,840.50	6.90	7.59	5240	590	286	578	4.1	564	2524	56.6	< 0.05	153	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.01	< 0.05	0.1	< 0.1	< 0.05	0.195	< 0.1	0.02	0.9	< 1	0.9	< 0.2	< 1	< 1
0627	N	7/8/1997	6,840.20	7.40	7.75	5600	616	303	543	4.3	560	2570	64.1	< 0.05	190	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.1	< 0.1	< 0.05	< 0.001	< 0.1	0.02	0.4	< 1	0.4	< 0.2	< 1	< 1
0627	N	10/7/1997	6,840.20	6.60	7.69	4960	601	276	439	3.5	599	2440	66	< 0.05	122	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.12	< 0.1	< 0.05	< 0.001	< 0.1	0.023	0.8	< 1	0.8	< 0.2	< 1	< 1
0627	N	1/16/1998	6,840.00	7.30	7.91	5260	582	289	545	4.6	682	2850	70.6	1.28	107	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.02	< 0.05	1.47	< 0.1	< 0.05	< 0.001	< 0.1	0.0222	0.9	< 1	0.9	< 0.2	< 1	< 1
0627	N	4/7/1998	6,840.20	6.90	7.74	5200	621	294	508	3.9	590	2400	54.6	< 0.05	141	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.12	< 0.1	< 0.05	< 0.001	< 0.1	0.0221	0.7	< 1	0.7	< 0.2	< 1	< 1
0627	N	7/7/1998	6,840.00	7.20	7.80	5210	598	288	529	4.3	588	2500	59.6	0.05	133	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.1	< 0.1	< 0.05	< 0.001	< 0.1	0.0233	1.6	2.6	4.2	< 0.2	< 1	< 1
0627	N	10/6/1998	6,839.80	6.97	7.85	5380	589	288	530	4.8	579	2670	61.5	0.06	109	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.14	< 0.1	< 0.05	< 0.001	< 0.1	0.0345	1.2	< 1	1.2	< 0.2	< 1	< 1
0627	N	1/6/1999	6,839.50	7.70	8.02	5340	566	284	509	4.8	586	2740	60	0.17	142	< 1	< 0.1	< 0.001	< 0.01	0.006	< 0.01	< 0.05	0.22	< 0.1	< 0.05	< 0.001	< 0.1	0.0239	< 0.2	< 1	0	< 0.2	< 1	< 1
0627	N	4/6/1999	6,839.50	7.10	7.84	5650	580	309	504	4.7	580	2660	68	0.27	131	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.18	< 0.1	< 0.05	0.002	< 0.1	0.0233	1	2.5	3.5	< 0.2	< 1	< 1
0627	N	7/13/1999	6,839.22	7.00	8.21	5320	579	308	498	10.6	594	2620	67.7	0.17	126	< 1	< 0.1	< 0.001	< 0.01	< 0.005	0.02	< 0.05	0.08	< 0.1	< 0.05	< 0.001	< 0.1	0.002	0.8	< 1	0.8	< 0.2	3	2.9
0627	N	10/5/1999	6,839.20	7.09	7.70	5320	521	274	512	5.1	594	2320	58.5	0.38	127	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.73	< 0.1	< 0.05	0.002	< 0.1	0.0247	1.3	< 1	1.3	< 0.2	< 1	< 1
0627	N	1/4/2000	6,839.10	7.00	8.10	5150	530	283	425	7.3	597	2430	57.2	0.14	144	< 1	< 0.1	< 0.001	< 0.01	< 0.005	0.06	< 0.05	0.86	< 0.1	< 0.05	0.003	< 0.1	0.0233	4.1	2	6.1	< 0.2	< 1	5.5
0627	N	5/10/2000	6,839.00	7.00	7.65	5200	535	278	501	4.1	588	2370	55.3	< 0.05	144	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.1	< 0.1	< 0.05	< 0.001	< 0.1	0.0259	0.4	6.3	6.7	< 0.2	5.7	< 1
0627	N	7/18/2000	6,838.60	6.96	7.91	5320	567	292	502	4.32	590	2390	53.3	< 0.05	149	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.11	< 0.1	< 0.05	< 0.001	< 0.1	< 0.0003	0.6	2.5	3.1	< 0.2	< 1	< 1
0627	N	10/10/2000	6,838.65	7.03	7.78	5100	496	261	512	5.4	580	2160	44.8	< 0.05	150	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.08	< 0.1	< 0.05	< 0.001	< 0.1	0.024	0.5	< 1	0.5	< 0.2	< 1	< 1
0627	N	1/9/2001	6,838.55	7.23	8.03	5170	583	303	454	5	595	2460	57.9	< 0.05	160	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.11	< 0.1	< 0.05	0.001	< 0.1	0.023	0.4	2.5	2.9	< 0.2	< 1	< 1
0627	N	2/6/2001	6,838.50	7.53	7.48	5040	654	321	558	6.1	592	2780	52.5	< 0.05	158	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.11	< 0.1	< 0.05	0.002	< 0.1	0.0239	0.5	1.5	2	< 0.2	< 1	< 1
0627	N	3/6/2001	6,838.30	7.31	7.69	4770	553	286	552	6.5	586	2680	53	< 0.05	156	< 1	< 0.1	0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.12	< 0.1	< 0.05	0.001	< 0.1	0.024	0.4	< 1	0.4	< 0.2	< 1	< 1
0627	N	4/10/2001	6,838.60	7.52	7.47	5020	656	319	446	5.3	590	2840	57.3	< 0.05	149	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.14	< 0.1	< 0.05	0.001	< 0.1	0.03	0.4	< 1	0.4	< 0.2	< 1	< 1
0627	N	5/8/2001	6,838.10	7.08	7.68	5190	557	289	530	4.9	577	2320	60.2	0.09	154	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.13	< 0.1	< 0.05	0.001	< 0.1	0.024	< 0.2	< 1	0	< 0.2	< 1	< 1
0627	N	6/5/2001	6,838.30	7.14	7.67	4950	576	304	521	3.8	580	2660	55.1	0.09	142	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.12	< 0.1	< 0.05	0.003	< 0.1	0.024	< 0.2	< 1	0	< 0.2	< 1	< 1
0627	N	7/10/2001	6,838.05	7.48	7.45	5270	585	313	585	4.4	600	2450	55.9	0.06	149	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.12	< 0.1	< 0.05	0.001	< 0.1	0.024	< 0.2	< 1	0	< 0.2	< 1	< 1
0627	N	8/8/2001	6,838.00	7.09	7.60	5220	540	290	460	4.1	596	2300	64	0.11	140	< 1	< 0.1	< 0.001	< 0.01	0.006	< 0.01	< 0.05	0.1	< 0.1	< 0.05	< 0.001	< 0.1	0.025	< 0.2	< 1	0	< 0.2	< 1	< 1
0627	N	9/11/2001	6,838.00	6.99	7.80	4190	550	290	540	4.9	600	2380	64.4	0.08	158	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.12	< 0.1	< 0.05	0.001	< 0.1	0.023	0.6	< 1	0.6	< 0.2	< 1	< 1
0627	N	10/2/2001	6,838.05	7.08	7.70	5230	540	290	540	5.6	609	2300	74	< 0.05	152	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.1	< 0.1	< 0.05	0.001	< 0.1	0.0235	0.7	< 1	0.7	< 0.2	< 1	< 1
0627	N	11/6/2001	6,838.00	7.13	7.90	5310	595	305	451	5.8	602	2600	69	0.06	142	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.11	< 0.1	< 0.05	0.002	< 0.1	0.0224	0.6	< 1	0.6	< 0.2	< 1	< 1
0627	N	12/4/2001	6,838.25	7.30	7.80	5190	559	277	498	4.7	610	2290	65.2	0.07	148	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.08	< 0.1	< 0.05	< 0.001	< 0.1	0.0223	0.8	< 1	0.8	< 0.2	< 1	< 1
0627	N	1/8/2002	6,837.90	7.27	7.70	5150	641	314	407	6.5	603	2290	73.6	< 0.05	134	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.11	< 0.1	< 0.05	< 0.001	< 0.1	0.0228	0.8	< 1	0.8	< 0.2	< 1	< 1
0627	N	2/5/2002	6,837.80	7.34	7.70	5190	625	298	436	6.1	601	2560	70.8	< 0.05	133	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.11	< 0.1	< 0.05	< 0.001	< 0.1	0.014	0.5	< 1	0.5	< 0.2	< 1	< 1
0627	N	3/5/2002	6,837.80	7.17	7.80	5160	595	300	495	5.1	611	2670	64.3	0.07	133	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.12	< 0.1	< 0.05	< 0.001	< 0.1	0.0251	0.4	< 1	0.4	< 0.2	< 1	< 1
0627	N	4/9/2002	6,837.50	7.08	7.64	5250	559	286	486	6.5	612	2440	74.1	0.09	142	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.11	< 0.1	< 0.05	< 0.001	< 0.1	0.0244	< 0.2	< 1	0	< 0.2	< 1	< 1
0627	N	5/7/2002	6,837.73	7.09	7.84	5180	594	294	512	5.9	601	2500	59.7	0.08	137	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.13	< 0.1	< 0.05	0.001	< 0.1	0.0249	< 0.2	< 1	0	< 0.2	< 1	< 1
0627	N	6/4/2002	6,837.61	7.17	7.71	5190	607	300	479	4.6	602	2550	53.8	0.12	122	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.13	< 0.1	< 0.05	< 0.001	< 0.1	0.0246	0.7	< 1	0.7	< 0.2	< 1	< 1
0627	N	7/9/2002	6,837.42	7.13	7.90	5350	587	306	495	5.5	608	2590	76	< 0.05	133	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.11	< 0.1	< 0.05	< 0.001	< 0.1	0.0228	0.3	< 1	0.3	< 0.2	< 1	< 1
0627	N	10/7/2002	6,837.30	7.10	7.65	4170	543	280	455	4.7	611	2160	50.1	0.06	139	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.09	< 0.1	< 0.05	< 0.001	< 0.1	0.0198	< 0.2	< 1	0	< 0.2	< 1	< 1
0627	N	1/7/2003	6,836.79	7.49	7.78	5190	586	315	556	4.6	614	2710	71.9	0.17	128	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.1	< 0.1	< 0.05	< 0.001	< 0.1	0.0291	< 0.2	< 1	0	< 0.2	< 1	< 1.0
0627	N	4/8/2003	6,836.52	6.98	7.50	5220	555	277	496	7.9	603	2280	58.1	0.11	147	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.08	< 0.1	< 0.05	< 0.001	< 0.1	0.0278	< 0.2	< 1	0	< 0.2	< 1	< 1.0
0627	N	7/8/2003	6,836.50	6.82	7.70	5190	534	282	455	6	317	2530	48.7	0.09	142	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.09	< 0.1	< 0.05	< 0.001	< 0.1	0.0241	< 0.2	< 1	0	< 0.2	< 1	< 1.0
0627	N	10/7/2003	6,836.43	6.90	7.74	5310	613	321	531	5	625	2700	56.7	0.13	134	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.06	< 0.1	< 0.05	< 0.001	< 0.1	0.0279	< 0.2	< 1	0	< 0.2	< 1	< 1.0
0627	N	1/6/2004	6,836.28	7.04	7.68	5200	533	285	489	5.2	637	2470	57.8	0.06	142 D	< 1.0	0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	0.003	< 0.1	0.0244 D	< 0.2	6.6	6.6	< 0.2	< 1.0	< 1.0
0627	N	4/6/2004	6,836.24	7.38	7.30	5170	591	304	491	5.3	619	2550 D	58.1	0.17	144 D	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.04	< 0.1	< 0.05	0.02	< 0.1	0.025 D	< 0.2	< 1	0	< 0.2	< 1	< 1
0627	N	7/13/2004	6,835.89	6.81	7.23	5320	592	298	497	6.1	618	2480 D	57	0.15	135 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	0.01	< 0.1	< 0.05	0.001	< 0.1	0.0254 D	0.5	< 1.0	0.5	< 0.2	< 1.0	< 1.0
0627	N	10/5/2004	6,835.97	6.92	7.50	5440	571 D	294 D	530 E	4.5	600	2470 D	54	< 0.05	125 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	0.009	< 0.1	0.0261 D	0.3	2	2.3	< 0.2	< 1.0	< 1.0
0627	N	1/12/2005	6,836.02	7.08	7.24	5190	598 D	304 D	518 D	5.9	596	2520 D	62	0.08	112 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.01	< 0.1	< 0.05	0.001	< 0.1	0.0269	0.5	< 1.0	0.5	< 0.2	< 1.0	< 1.0
0627	N	4/5/2005	6,835.55	7.19	7.70	5000	602	318	518	5.1	612	2590	56	< 0.05	110	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	< 0.001	< 0.1	0.028	1	< 1.0	1	< 0.2	< 1.0	< 1.0
0627	N	7/12/2005	6,835.37	7.01	7.76	4950	594 D	299 D	494	4.4	581	2570 D	52	< 0.05	108 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	< 0.001	< 0.1	0.0254	0.4	< 1.0	0.4	< 0.2	< 1.0	< 1.0
0627	N	10/4/2005	6,835.48	7.00	7.60	4930	554 D	284 D	495	5.2	595	2530 D	54	< 0.05	108 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	< 0.001	< 0.1	0.0271	0.3	1.4	1.7	< 0.2	< 1.0	< 1.0

TABLE A.1
Southwest Alluvium Data Summary, 1989-2019
United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
0627	N	1/10/2006	6,835.12	7.06	7.79	4810	527	270	507	4.3	640	2380 D	48	< 0.05	112 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	0.01	< 0.1	0.0268	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
0627	N	4/4/2006	6,835.02	6.98	7.30	4800	587 D	303 D	486	5.9	587	2560 D	55	< 0.05	117 D	< 1.0	< 0.1	< 0.001	< 0.01	0.006	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	0.005	< 0.1	0.0251 D	< 0.2	2.7	2.7	< 0.2	< 1.0	< 1.0
0627	N	7/18/2006	6,834.87	6.92	6.91	4790	554 D	279 D	538	6.4	571	2660 D	45	< 0.05	109 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	< 0.001	< 0.1	0.0245	0.4	2.2	2.6	< 0.2	< 1.0	2
0627	N	10/3/2006	6,834.82	6.92	6.92	4670	528 D	261 D	460	5.7	592	2350 D	39	0.08	108 D	< 0.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	< 0.001	< 0.1	0.0235	0.7	< 1	0.7	< 0.2	< 1	< 1
0627	N	1/9/2007	6,834.77	7.09	6.96	4870	512 D	263 D	443	5.6	580	2460 D	47	<0.05	103 D	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	<0.01	<0.1	<0.05	<0.001	<0.1	0.0228	<0.2	<1	0	<0.2	<1	<1
0627	N	4/10/2007	6,835.02	7.18	7.18	4740	548 D	272 D	446	7.4	573	2430 D	45	0.06	115 D	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	<0.01	<0.1	<0.05	<0.001	<0.1	0.0252	<0.2	<1	0	<0.2	<1	<1
0627	N	7/10/2007	6,834.67	6.97	6.81	4590	571 D	278 D	489	5.8	612	2590 D	41	0.05	117 D	<0.5	<0.1	0.01	<0.01	<0.005	<0.01	<0.05	<0.01	<0.1	<0.05	<0.001	<0.1	0.0246	<0.2	<1	0	<0.2	<1	<1
0627	N	10/2/2007	6,834.55	6.87	7.26	4710	486 D	244 D	469 D	6.2	593	2270 D	63 D	0.18	107 D	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	<0.01	<0.1	<0.05	<0.001	<0.1	0.0243	<0.2	<1	0	<0.2	<1	<1
0627	N	1/15/2008	6,834.77	7.05	7.03	4750	532 D	256 D	513 D	6.7	568	2340 D	64 D	< 0.05	109 D	< 0.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	< 0.001	< 0.1	0.0224	< 0.2	< 1	0	< 0.2	< 1	< 1
0627	N	4/8/2008	6,834.72	6.94	7.32	4600	565 D	282 D	528 D	6.4 D	546	2530 D	36	< 0.1	159 D	< 0.50	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	< 0.001	< 0.1	0.0227	0.003 U	-0.7 U	-0.697	0.2	0 U	1 U
0627	N	7/8/2008	6,834.47	6.68	7.23	4610	527	250	458 D	5	578	2460 D	50	< 0.05	178 D	< 0.5	< 0.1	< 0.003	< 0.01	< 0.005	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	< 0.001	< 0.1	0.0214	0.35	1.2 U	1.55	0.3	-0.2 U	0.6 U
0627	N	10/7/2008	6,833.99	6.98	7.09	4510	530	253	477 D	5	560	2420 DH	36	< 0.1	167 D	< 0.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.04	< 0.1	< 0.05	< 0.001	< 0.1	0.0201	0.05 U	0.06 U	0.11	-0.1 U	0 U	1
0627	N	1/13/2009	6,834.22	6.90	7.10	4720	580	274	518	6	565	2210 D	28	<0.05	172 D	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.09	<0.1	<0.05	<0.001	<0.1	0.0215	0.07 U	0.61 U	0.68	-0.2 U	-1 U	1.4
0627	N	4/7/2009	6,834.02	6.82	6.99	4650	509 D	244 D	472 D	6	586	2410 D	39	<0.05	107 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.03	<0.1	<0.05	0.001	<0.1	0.0196	0.16 U	0.52 U	0.68	0.02 U	0.6 U	0.4 U
0627	N	7/7/2009	6,834.02	6.76	7.23	4610	510	239	473	5	579	2310 D	44	<0.05	105 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.02	<0.1	<0.05	<0.001	<0.1	0.0198	0.06 U	0.89 U	0.95	0.01 U	-1 U	0.8
0627	N	10/6/2009	6,834.02	6.93	7.67	4530	510	240	483	5	583	2440 D	44	<0.05	111 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.02	<0.1	<0.05	<0.001	<0.1	0.0213	0.36	0.81 U	1.17	0.02 U	-1 U	0.6 U
0627	N	1/5/2010	6,833.82	6.90	7.48	4810 D	517 D	234	466 D	6	599	2580 D	39	<0.05	102 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.02	<0.1	<0.05	<0.001	<0.1	0.0188	-0.02 U	0.10 U	0.08	0.05 U	-2 U	0.7 U
0627	N	4/6/2010	6,833.67	6.91	7.12	4540 D	510 D	220	451 D	6	625	2430 D	40	<0.05	102 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	<0.01	<0.1	<0.05	<0.001	<0.1	0.0196	0.33	0.19 U	0.52	0.01 U	2.6 U	0.2 U
0627	N	7/13/2010	6,833.57	6.72	7.29	4570 D	536	242	487	6	614	2370 D	39 D	<0.05	96 D	<0.50	0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.01	<0.1	<0.05	<0.001	<0.1	0.0197	0.23	0.15 U	0.38	0.04 U	0.7 U	-0.1 U
0627	N	10/5/2010	6,833.47	6.94	7.59	4550 D	524	230	478	6	618	2410 D	38 D	0.06	97 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.05	<0.1	<0.05	<0.001	<0.1	0.0209	-0.05 U	0.70 U	0.65	0.06 U	1.6 U	0.3 U
0627	N	1/4/2011	6,833.42	6.85	7.47	4300 D	526	238	456	6	601	2350 D	40 D	<0.05	85 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.03	<0.1	<0.05	<0.001	<0.1	0.0201	0.14 U	0.60 U	0.74	0.09 U	0.4 U	0.08 U
0627	N	4/5/2011	6,833.32	6.86	7.12	4320 D	530	231	503	6	594	2390 D	38 D	<0.05	94 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.03	<0.1	<0.05	<0.001	<0.1	0.0189	0.009 U	0.34 U	0.349	0.005 U	0.2 U	0.09 U
0627	N	7/12/2011	6,833.17	6.98	7.67	4330 D	538	239	490	6	599	2350 D	37 D	<0.1	101 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.02	<0.1	<0.05	<0.001	<0.1	0.0198	0.16	0.28 U	0.44	0.04 U	0.7 U	0.4 U
0627	N	10/4/2011	6,833.11	6.99	7.70	4260 D	509	227	460	6	559	2420 D	39 D	<0.1	96 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.02	<0.1	<0.05	<0.001	<0.1	0.0184	0.15	0.06 U	0.21	0.03 U	0.9 U	-0.009 U
0627	N	1/3/2012	6,832.82	7.12	7.07 H	4250 D	552	238	445	7	552	2300 D	38 D	<0.05	94 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.02	<0.1	<0.05	<0.001	<0.1	0.0192	0.57	-0.1 U	0.57	0.05 U	1.2 U	0.5
0627	N	4/3/2012	6,832.87	7.01	6.91 H	4360 D	556	213	400	6	589	2310 D	38 D	<0.05	91 D	<0.50	<0.1	<0.01	<0.01	<0.005	<0.01	<0.05	0.02	<0.1	<0.05	<0.001	<0.1	0.0208	0.06 U	0.39 U	0.84	0.005 U	0.2 U	0.2 U
0627	N	7/11/2012	6,832.62	6.86	7.00 H	4380	542	242	460 D	6	585	2270 D	37 D	<0.05	96 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	0.001	0.07	<0.1	<0.05	<0.001	<0.1	0.0183	0.17	0.19 U	0.55	0.02 U	1 U	0.07 U
0627	N	10/9/2012	6,832.52	7.03	6.97 H	4510	555	231	443 D	7	609	2280 D	39 D	<0.05	89 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.03	<0.1	<0.05	<0.001	<0.1	0.0199	0.24	0.23 U	0.24	0.2	0.7 U	0.3 U
0627	N	1/14/2013	6,832.56	6.89	6.97 H	4420	561	241	468 D	6	605	2370 D	37 D	<0.05	76 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.09	<0.1	<0.05	0.001	<0.1	0.0211	0.28	0.52 U	0.28	0.09 U	0.6 U	0.1 U
0627	N	4/2/2013	6,832.37	6.99	7.01 H	4280	542	236	438	6	610	2300 D	37 D	<0.05	90 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.17	<0.1	<0.05	<0.001	<0.1	0.0209	0.10 U	0.45 U	0	0.05 U	0.3 U	0.8
0627	N	7/9/2013	6,832.02	6.80	7.01 H	4300	540	231	425	5	610	2280 D	33 D	<0.05	85 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.03	<0.1	<0.05	<0.001	<0.1	0.0202	0.06 U	-0.4 U	0	0.02 U	-0.06 U	0.3 U
0627	N	10/1/2013	6,832.09	6.86	6.95 H	4250	520	228	412	5	617	2230 D	33 D	<0.05	87 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.02	<0.1	<0.05	<0.001	<0.1	0.0221	0.26	0.43 U	0.26	0.07 U	0.4 U	-0.1 U
0627	N	1/7/2014	6,832.13	7.09	6.95	4330	509	224	400	5	608	2230	34	<0.05	86	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.03	<0.1	<0.05	<0.001	<0.1	0.0209	0.33	-0.2 U	0.33	0.04 U	0.4 U	0.3 U
0627	N	4/1/2014	6,832.14	7.08	6.91 H	4210	522	231	438 D	6	609	2230 D	37 D	<0.05	83 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.03	<0.1	<0.05	<0.001	<0.1	0.0195	0.43	-0.2 U	0.43	0.04 U	0.8 U	0.5
0627	N	7/8/2014	6,831.78	7.06	6.87 H	4240	527	237	438 D	6	623	2310 D	33 D	<0.05	80 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.03	<0.1	<0.05	<0.001	<0.1	0.0198	0.2	0.09 U	0.2	0.01 U	0.01 U	-0.1 U
0627	N	10/7/2014	6,831.77	6.99	6.93 H	4280	527	228	392	5	613	2230 D	33 D	<0.05	75 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.08	<0.1	<0.05	<0.001	<0.1	0.0208	0.21	1.2 U	0.21	-0.01 U	0.6 U	0.3 U
0627	N	1/6/2015	6,831.64	7.01	6.86 H	4240	517	222	382	5	595	2370 D	42 D	<0.05	83 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.04	<0.1	<0.05	<0.001	<0.1	0.0212	0.21	0.77 U	0.21	0.06 U	-0.07 U	1.6
0627	N	4/7/2015	6,831.68	6.94	6.92 H	4260	532	228	395	5	625	2230 D	39 D	<0.05	82 D	<0.5	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.15	<0.1	<0.05	<0.001	<0.1	0.02	0.44	0.86 U	0.44	-0.009 U	0.8 U	1.5
0627	N	7/7/2015	6,831.50	6.81	6.89 H	4370	507	227	371	5.2	628	2360 D	35 D	<0.05	74 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.09	<0.1	<0.05	<0.001	<0.1	0.0196	0.32	1.0 U	0.32	0.3	0.3 U	0.0009 U
0627	N	10/6/2015	6,831.33	7.01	6.87 H	4260	513	223	380	5	576	2330 D	35 D	<0.05	76 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.04	<0.1	<0.05	<0.001	<0.1	0.0198	0.15	0.82 U	0.15	0.07 U	0.7 U	1.0 U
0627	N	1/5/2016	6,831.36	7.06	6.89 H	4210	530	233	390	5	615	2340 D	34 D	<0.05	83 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.26	<0.1	<0.05	<0.001	<0.1	0.0206	0.18	0.32 U	0.18	-0.006 U	0.2 U	0.6 U
0627	N	4/5/2016	6,831.08	6.90	7.09 H	4200	541	235	387	5	594	2350 D	34 D	<0.05	82 D	<0.50	0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.05	<0.1	<0.05	<0.001	<0.1	0.0201	0.24	0.59 U	0.24	0.06 U	0.1 U	1.7
0627	N	7/12/2016	6,831.02	6.98	6.90 H	4280	542	231	383	5	602	2450 D	37 D	<0.05	86 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.18	<0.1	<0.05	<0.001	<0.1	0.019	0.2	3.6	3.8	0.06 U	0.3 U	0.9 U
0627	N	10/4/2016	6,831.06	7.08	6.93 H	4180	539	235	385	5	608	2380 D	34 D	<0.05	84 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.05	<0.1	<0.05	<0.001	<0.1	0.0181	0.26	0.73 U	0.26	-0.004 U	1.3	1.4
0627	N	1/10/2017	6,830.79	6.94	6.96 H	4170 D	555	230	376	6	591	2330 D	35 D	<0.05	86 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.12	<0.1	<0.05	<0.001	<0.1	0.0182	0.18	0.63 U	0.18	0.01 U	0.4 U	1.2 U
0627	N	4/4/2017	6,830.71	6.84	6.94 H	4120 D	529	229	375	6	588	2390 D	36 D	<0.05	84 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.09	<0.1	<0.05	<0.001	<0.1	0.0194	0.21	0.87 U	0.21	0.04 U	0.4 U	1.1 U
0627	N	7/11/2017	6,830.44	6.88	6.96 H	4180 D	488	211	346	6	588	2170 D	33 D	<0.05	81.0 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.05	<0.1	<0.05	<0.001	<0.1	0.0196	0.2	-0.6 U	0.2	0.07 U	0.8 U	0.5
0627	N	10/3/2017	6,830.29	6.86	7.02 H	4080 D	523	226	364	5	600	2170 D	31 D	<0.05	79.0 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.15	<0.1	<0.05	<0.001	<0.1	0.021	0.2	1 U	0	0.05 U	1.0 U	0.7
0627	N	1/9/2018	6,830.21	6.93	6.95 H	4140 D	521	226	351 D	5	554	2320 D	32 D	<0.05	78.2 D	<0.50	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	0.040 D	<0.001	<0.005	<0.001	<0.01	0.0212	0.3	1.1 U	0.3	0.1	0.2 U	0.4 U
0627	N	4/3/2018	6,830.02	6.93	7.04 H	4240 D	522	215	348	5	560	2340 D	33 D	<0.05	83 D	<0.50	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	0.098	<0.001	<0.005	<0.001	<0.01	0.0179	0.3	1.0 U	0.3	0.02 U	0.4 U	0.6
0627	N	7/10/2018	6,829.70	6.85	6.93 H	4220 D	539	231	387	5	567	2210 D	31 D	<0.05	82.5 D	<0.50	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	0.063	<0.001	<0.005	<0.001	<0.01	0.0192	0.2 U	0.5 U	0	0.1 U	0.2 U	0.5 U
0627	N	10/2/2018	6,829.64	6.96	6.95 H	4250 D	540	234	374 D	6	570	2340 D	34 D	<0.05	79.0 D	<0.50	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	0.102	<0.001	<0.005	<0.001	<0.01	0.0198	0.3	1.6	1.9	0.03 U	0.01 U	3.1
0627	N	1/8/2019	6,829.53	6.92	6.95	4170	520	225	380	5	568	2320	33	<0.05	71.5	<0.50	<0.03	no data	<0.001	<0.001	<0.005	0.006	0.123	<0.001	<0.005	no data	<0.01	0.0211	0.3	0.08	0.38	-0.003 U	0.2	0.6
0627	N	4/9/2019	6,829.51	6.87	7.06 H	4270 D	517	231	382	5	577	2320 D	31 D	<0.05	73.5 D	<0.50	<0.03	0.002	<0.001	<0.001	<0.005	<0.001	0.027	<0.001	0.005	0.018	<0.01	0.0186	0.3	-0.09 U	0.21	0.06 U	1.2	0.9
0627	N	7/30/2019	6,829.22	6.92	7.01 H	4190 DH	500	213	341	5	570	2280 D	31 D	<0.05	71.5 D	<0.50	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	0.12 D	<0.001	<0.005	0.02	<0.01	0.0186	0.4	0.4 U	0.8	0.08	0.2 U	0.9
0627	N	10/11/2019	6,829.06	7.04	7 H	4140 D	531	232	374	6	568	2330 D	31 D	<0.05	70 D	<0.50	<0.02 D	<0.001	<0.001	<0.001	<0.005	0.004	0.07 D	<0.003 D	<0.005	0.018 D	<0.01	0.018 D	0.4	0.2 U	0.6	-0.04 U	1.1	0.7
0632	N	7/19/1989	6,874.20	6.50	6.77	6819	788	667	330	9.2	2123	2840	242	0.5	107	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.15	< 0.1	< 0.05	0.004	< 0.1	0.111	1.7	1.7	3.4	1.1	< 1	4.1
0632	N	10/16/1989	6,874.00	6.80	7.10	6466	781	671	408	10.7	2257	2578	246	0.47	95	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.12	< 0.1	< 0.05	0.003	< 0.1	0.111	1.5	1.4	2.9	< 0.2	< 1	< 1
0632	N	1/10/1990	6,872.30	6.40	6.54	6860	783	712	407	8.35	2111	2747	251	0.43	83	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.04	< 0.05	0.15	< 0.1	0.07	0.003	< 0.1	0.084	1	1.6	2.6	< 0.2	< 1	1.2

TABLE A.1

Southwest Alluvium Data Summary, 1989-2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
0632	N	4/10/1990	6,870.40	6.30	7.16	6977	778	688	380	7.4	2208	2677	258	0.44	107	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.03	< 0.05	0.24	< 0.1	< 0.05	0.003	< 0.1	0.084	1	1.6	2.6	< 0.2	< 1	1.2
0632	N	7/10/1990	6,871.10	6.30	6.86	7355	819	674	412	7.9	2296	3007	248	0.37	124	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.01	< 0.05	0.27	< 0.1	< 0.05	0.004	< 0.1	0.0785	1	1.8	2.8	< 0.2	< 1	1
0632	N	10/9/1990	6,870.40	6.20	7.27	7558	839	707	433	9	2239	2945	258	0.52	106	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.02	< 0.05	0.22	< 0.1	< 0.05	0.003	< 0.1	0.1312	0.5	2.3	2.8	< 0.2	< 1	< 1
0632	N	1/10/1991	6,869.90	6.30	7.18	7367	900	760	429	8.9	2184	3027	267	0.4	113	< 1	< 0.1	0.002	< 0.01	< 0.01	0.02	< 0.05	0.25	< 0.1	0.05	0.005	< 0.1	0.0795	2.2	< 1	2.2	< 0.2	< 1	2.7
0632	N	4/11/1991	6,869.90	6.20	7.36	7346	857	663	451	9.4	2285	3053	274	0.37	146	< 1	< 0.1	0.002	< 0.01	< 0.01	0.02	< 0.05	0.29	< 0.1	< 0.05	0.005	< 0.1	0.0931	1.1	< 1	1.1	< 0.2	< 1	1
0632	N	7/9/1991	6,868.30	6.30	6.68	7472	833	636	390	6.9	2336	2964	273	0.61	117	< 1	0.14	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.25	< 0.1	< 0.05	0.003	< 0.1	0.0818	0.7	1.8	2.5	< 0.2	< 1	< 1
0632	N	10/17/1991	6,867.50	6.10	7.08	7677	886	630	426	8.4	2510	2959	267	0.72	87.6	< 1	< 0.1	0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.43	< 0.1	< 0.05	0.018	< 0.1	0.169	0.8	< 1	0.8	< 0.2	1.6	< 1
0632	N	1/21/1992	6,867.60	6.20	6.95	7030	747	758	424	7.2	2211	3200	261	0.6	76.1	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.25	< 0.1	< 0.05	0.004	< 0.1	0.072	1.2	2.6	3.8	< 0.2	< 1	1
0632	N	4/14/1992	6,868.30	6.10	7.56	7706	677	557	460	9.1	2184	3126	263	0.55	75.7	< 1	< 0.1	0.002	< 0.01	< 0.01	< 0.01	< 0.05	0.28	< 0.1	< 0.05	0.008	< 0.1	0.08	0.9	3.7	4.6	< 0.2	1.6	< 1
0632	N	7/14/1992	6,864.50	6.00	8.05	6323	815	547	451	11.3	1568	2948	265	0.36	119	< 1	< 0.1	0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.16	< 0.1	< 0.05	0.003	< 0.1	0.095	2.2	1.1	3.3	< 0.2	4.2	2.5
0632	N	10/13/1992	6,863.00	6.40	7.02	6472	719	594	417	7.4	2495	2903	269	0.18	89.5	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.02	< 0.05	0.16	< 0.1	< 0.05	0.003	< 0.1	0.147	1.3	6.4	7.7	< 0.2	< 1	1.5
0632	N	1/12/1993	6,864.80	6.40	7.02	5933	750	571	438	11.2	1220	3037	265	0.24	92.7	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.85	< 0.1	< 0.05	0.004	< 0.1	0.068	1.1	4.5	5.6	< 0.2	< 1	1.5
0632	N	4/14/1993	6,865.60	6.40	7.11	6925	696	633	433	6.7	2113	2962	269	0.31	95.3	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.32	< 0.1	< 0.05	0.002	< 0.1	0.113	6.4	2	8.4	1.3	1.2	8.1
0632	N	7/15/1993	6,862.20	6.40	6.72	6303	701	607	426	9.1	2098	3107	264	0.19	62.1	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.01	< 0.05	0.18	< 0.1	< 0.05	0.005	< 0.1	0.082	1.2	< 1	1.2	< 0.2	< 1	1.5
0632	N	10/7/1993	6,860.40	6.50	7.10	5715	676	555	384	6.6	2240	2392	255	0.13	56.6	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.27	< 0.1	< 0.05	0.003	< 0.1	0.093	1.8	1.1	2.9	< 0.2	1.2	1.8
0632	N	1/6/1994	6,862.40	6.50	7.51	6091	690	549	409	6.9	1984	2705	252	0.17	36.5	1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.34	< 0.1	< 0.05	< 0.001	< 0.1	0.082	1.6	3.4	5	< 0.2	< 1	7.7
0632	N	4/14/1994	6,862.50	6.40	6.74	5930	683	579	426	7.8	2063	2807	251	0.33	25.9	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.37	< 0.1	< 0.05	0.001	< 0.1	0.088	1.7	2.4	4.1	< 0.2	2.4	5.5
0632	N	7/21/1994	6,862.70	6.40	7.19	6160	745	632	383	7.5	2123	3080	246	0.23	30.3	< 1	< 0.1	0.002	< 0.01	< 0.01	< 0.01	< 0.05	0.39	< 0.1	< 0.05	0.002	< 0.1	0.09	0.9	5.1	6	< 0.2	< 1	8.7
0632	N	10/5/1994	6,861.10	6.30	7.47	6288	692	619	431	8.1	2200	2689	255	0.23	20.9	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.42	< 0.1	< 0.05	< 0.001	< 0.1	0.08	1	< 1	1	< 0.2	3.6	1.2
0632	N	1/10/1995	6,861.70	6.40	7.45	6458	708	655	348	8.2	2184	2857	250	0.41	21.9	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.43	< 0.1	< 0.05	< 0.001	< 0.1	0.086	2	< 1	2	< 0.2	1.7	3.7
0632	N	4/5/1995	6,860.90	6.50	6.93	6453	685	650	420	10.8	2119	2905	250	2.51	23.9	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.52	< 0.1	< 0.05	0.002	< 0.1	0.077	1.2	3.1	4.3	< 0.2	1.1	6
0632	N	7/6/1995	6,860.30	6.40	7.52	6335	696	646	393	8.5	2281	2647	285	0.43	24.1	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.5	< 0.1	< 0.05	0.002	< 0.1	0.0954	1.6	< 1	1.6	0.4	< 1	4.2
0632	N	10/3/1995	6,860.30	6.30	7.52	6319	695	585	374	8.2	2247	2745	250	0.44	16.8	< 1	< 0.1	0.003	< 0.01	< 0.01	< 0.01	< 0.05	0.11	< 0.1	< 0.05	< 0.001	< 0.1	0.0899	1.1	< 1	1.1	< 0.2	3.3	2.6
0632	N	1/4/1996	6,859.10	6.50	7.59	6294	760	625	378	7.9	2239	2595	250	0.22	16.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.74	< 0.1	< 0.05	< 0.001	< 0.1	0.092	1	1.1	2.1	0.3	1.2	1.8
0632	N	4/2/1996	6,859.30	6.60	7.82	5940	650	585	384	8.1	1807	2715	278	0.26	17.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.55	< 0.1	< 0.05	< 0.001	< 0.1	0.09	1.7	< 1	1.7	< 0.2	< 1	5.8
0632	N	7/7/1996	6,858.80	6.40	7.40	6258	671	589	397	8.8	2035	2749	233	0.29	10.9	1.68	< 0.1	0.014	< 0.01	< 0.01	< 0.01	< 0.05	0.61	< 0.1	< 0.05	0.012	< 0.1	0.092	0.8	< 1	0.8	< 0.2	< 1	< 1
0632	N	10/1/1996	6,859.30	6.50	6.92	6280	676	602	396	8.5	2050	2758	255	0.2	11.5	1	< 0.1	0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.57	< 0.1	< 0.05	0.002	< 0.1	0.078	0.8	< 1	0.8	< 0.2	< 1	3.4
0632	N	1/22/1997	6,858.60	6.50	7.49	6120	670	590	379	8.7	2130	2740	285	0.2	10	1.1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.63	< 0.1	< 0.05	< 0.001	< 0.1	0.077	1.4	< 1	1.4	< 0.2	< 1	< 1
0632	N	4/8/1997	6,858.30	6.50	7.75	6180	679	591	369	8.6	2010	2694	287	0.2	9.8	1.05	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.63	< 0.1	< 0.05	< 0.001	< 0.1	0.088	1	3.2	4.2	< 0.2	< 1	< 1
0632	N	7/8/1997	6,858.80	6.80	7.64	6330	707	613	362	8.5	2020	2560	264	0.18	8.15	1.14	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.57	< 0.1	< 0.05	< 0.001	< 0.1	0.077	0.8	5	5.8	< 0.2	< 1	< 1
0632	N	10/7/1997	6,858.40	6.40	7.63	6170	679	592	369	8.4	2020	2740	290	0.12	6.37	1.48	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.82	< 0.1	< 0.05	< 0.001	< 0.1	0.075	0.7	< 1	0.7	< 0.2	< 1	< 1
0632	N	1/16/1998	6,858.10	6.60	7.68	6170	660	573	383	9.3	2020	2900	288	0.27	7.24	1.9	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.75	< 0.1	< 0.05	< 0.001	< 0.1	0.089	0.9	< 1	0.9	< 0.2	< 1	2
0632	N	4/7/1998	6,857.90	6.50	7.39	5970	681	594	385	8.4	2030	2500	234	0.1	7.95	1.9	< 0.1	< 0.001	< 0.1	< 0.005	< 0.01	< 0.05	0.71	< 0.1	< 0.05	0.005	< 0.1	0.086	1.6	< 1	1.6	< 0.2	< 1	< 1
0632	N	7/7/1998	6,858.10	6.70	7.81	6250	658	594	392	8.5	1880	2600	264	0.26	5	2.3	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.72	< 0.1	< 0.05	< 0.001	< 0.1	0.0859	1.7	3.4	5.1	< 0.2	< 1	< 1
0632	N	10/6/1998	6,859.00	6.58	7.71	6200	664	598	401	9.1	1820	2730	279	0.22	7.89	2.4	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.74	< 0.1	< 0.05	< 0.001	< 0.1	0.144	1.3	< 1	1.3	< 0.2	< 1	< 1
0632	N	1/5/1999	6,857.40	6.70	7.82	6200	629	559	331	8.6	1930	2440	242	0.21	5.94	1.6	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.66	< 0.1	< 0.05	< 0.001	< 0.1	0.0817	< 0.2	< 1	0	< 0.2	< 1	< 1
0632	N	4/6/1999	6,857.30	6.60	7.90	6320	662	594	354	8.1	1890	2720	251	0.21	6.37	1.5	< 0.1	< 0.001	< 0.01	0.008	< 0.01	< 0.05	0.7	< 0.1	< 0.05	< 0.001	< 0.1	0.124	1.7	< 1	1.7	< 0.2	< 1	< 1
0632	N	7/13/1999	6,857.09	6.30	7.78	6140	651	602	336	14.3	1910	2830	244	0.21	5.72	1.8	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.72	< 0.1	< 0.05	< 0.001	< 0.1	0.0775	0.5	< 1	0.5	< 0.2	2.9	3.5
0632	N	10/5/1999	6,858.10	6.60	7.75	6060	691	667	375	8.3	1850	3140	235	0.16	6.03	2.1	< 0.1	< 0.001	< 0.01	0.006	< 0.01	< 0.05	0.85	< 0.1	< 0.05	0.001	< 0.1	0.0795	2.1	< 1	2.1	< 0.2	< 1	1.6
0632	N	1/4/2000	6,857.60	6.60	7.93	6210	581	555	283	10.8	1790	2610	217	0.24	4.44	2	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.87	< 0.1	0.05	0.001	< 0.1	0.0704	1.3	< 1	1.3	< 0.2	< 1	2.1
0632	N	5/8/2000	6,856.90	6.30	7.60	6020	579	560	366	8.3	1800	2640	238	0.05	2.44	2.8	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.04	< 0.1	< 0.05	< 0.001	< 0.1	0.0774	0.5	< 1	0.5	< 0.2	< 1	< 1
0632	N	7/12/2000	6,856.90	6.25	6.98	6070	595	580	366	8.09	1810	2510	239	0.08	2.92	2	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.79	< 0.1	< 0.05	< 0.001	< 0.1	0.0739	0.9	2.1	3	< 0.2	< 1	< 1
0632	N	10/3/2000	6,856.70	6.28	7.18	6020	622	610	240	9.7	1780	2820	230	0.07	3.17	2.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	0.06	0.73	< 0.1	< 0.05	0.001	< 0.1	0.018	0.8	< 1	0.8	< 0.2	< 1	< 1
0632	N	1/8/2001	6,858.50	6.38	7.38	6180	624	612	347	8.7	1740	3020	223	0.17	2.69	3.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.85	< 0.1	< 0.05	0.001	< 0.1	0.064	0.7	1.9	2.6	< 0.2	< 1	< 1
0632	N	2/5/2001	6,859.80	6.55	7.04	6410	729	701	428	10.3	1660	3420	233	0.35	5.9	2.8	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.85	< 0.1	< 0.05	< 0.001	< 0.1	0.066	1.2	2.4	3.6	< 0.2	< 1	< 1
0632	N	3/6/2001	6,860.20	6.51	7.31	6100	630	653	450	10.3	1640	3400	199	0.34	12.7	3.2	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.92	< 0.1	< 0.05	< 0.001	< 0.1	0.0601	1	< 1	1	< 0.2	< 1	< 1
0632	N	4/3/2001	6,860.70	6.45	7.17	6800	710	713	359	8.1	1600	3370	228	0.33	21.6	3.49	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.87	< 0.1	< 0.05	< 0.001	< 0.1	0.059	1.1	< 1	1.1	< 0.2	< 1	1.7
0632	N	5/7/2001	6,860.90	6.30	7.41	6860	625	650	410	8.7	1600	3000	244	0.36	26.5	1.9	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.95	< 0.1	< 0.05	< 0.001	< 0.1	0.062	< 0.2	< 1	0	< 0.2	< 1	< 1
0632	N	6/4/2001	6,861.20	6.36	7.22	6620	622	663	316	8.9	1580	3180	246	0.38	32.7	3.1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.98	< 0.1	< 0.05	0.004	< 0.1	0.06	1.4	3.1	4.5	< 0.2	< 1	< 1
0632	N	7/9/2001	6,861.43	6.84	7.08	6990	682	742	348	8.5	1680	3260	253	0.33	35.9	3.1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.97	< 0.1	< 0.05	< 0.001	< 0.1	0.0632	1.1	< 1	1.1	< 0.2	< 1	< 1
0632	N	8/6/2001	6,861.39	6.27	7.20	7000	620	680	340	9	1670	3000	300	0.31	34.2	2.7	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.1	< 0.1	< 0.05	< 0.001	< 0.1	0.072	0.7	2.2	2.9	< 0.2	< 1	< 1
0632	N	9/10/2001	6,861.60	6.25	7.00	7020	630	700	355	9.4	1700	3100	273	0.32	45.3	2.46	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.91	< 0.1	< 0.05	< 0.001	< 0.1	0.0582	1	2.7	3.7	< 0.2	< 1	< 1
0632	N	10/1/2001	6,861.65	6.35	7.40	7080	610	690	336	10.1	1730	2900	311	0.28	40.2	1.95	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.85	< 0.1	< 0.05	< 0.001	< 0.1	0.0608	1.1	< 1	1.1	< 0.2	< 1	< 1
0632	N	11/5/2001	6,861.80	6.34	7.50	7060	669	732	360	10	1680	3390	293	0.3	43.2	2.4	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.97	< 0.1	< 0.05	< 0.001	< 0.1	0.0542	1	< 1	1	< 0.2	< 1	< 1
0632	N	12/3/2001	6,861.90	6.37	6.80	7100	613	671	309	8.7	1740	3000	272	0.33	46	1.8	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.87	< 0.1	< 0.05	< 0.001	< 0.1	0.0577	0.9	3.4	4.3	< 0.2	< 1	< 1
0632	N	1/8/2002	6,862.00	6.45	7.00	7020	719	748	289	10.5	1700	3530	294	0.33	40.2	2.4	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.95	< 0.1	< 0.05	< 0.001	< 0.1	0.0575	1.2	1.2	2.4	< 0.2	< 1	3.2
0632	N	2/4/2002	6,862.10	6.37	7.00	7070	690	717	332	10.1	1720	3330	292	0.37	41.1	2.36	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.92	< 0.1	< 0.05	< 0.001	< 0.1	0.051	1.3	1.8	3.1	< 0.2	< 1	< 1
0632	N	3/4/2002	6,862.05	6.36	7.10	7080	649	721	376	9.4	1690	3460	278	0.32	44	2.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.08	< 0.1	< 0.05	< 0.001	< 0.1	0.066	0.6	< 1	0.6	< 0.2	< 1	1.8
0632	N	4/2/2002	6,862.31	6.32	7.04	7140	674	733	378	11.8	1730	3530	280	0.34	42.5	2.7	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.13	< 0.1	< 0.05	< 0.001	< 0.1	0.059	1.3	2.9	4.2	< 0.2	< 1	< 1

TABLE A.1

Southwest Alluvium Data Summary, 1989-2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
0632	N	5/6/2002	6,862.32	6.22	7.16	7130	649	715	388	10.7	1720	3270	260	0.34	43.7	2.4	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.12	< 0.1	< 0.05	< 0.001	< 0.1	0.0636	0.8	2.2	3	< 0.2	< 1	2.1
0632	N	6/3/2002	6,862.41	6.24	7.30	7150	645	717	349	8.9	1710	3290	240	0.34	45.1	2.8	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1	< 0.1	< 0.05	< 0.001	< 0.1	0.058	0.6	< 1	0.6	< 0.2	< 1	< 1
0632	N	7/8/2002	6,862.21	6.47	7.75	7200	645	761	292	11.4	1710	3490	229	0.36	43.3	2.4	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.96	< 0.1	< 0.05	< 0.001	< 0.1	0.0708	1	< 1	1	< 0.2	< 1	< 1
0632	N	10/8/2002	6,862.08	6.61	7.29	7100	578	685	356	8.7	1700	3150	221	0.3	45.7	2.6	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.07	< 0.1	< 0.05	< 0.001	< 0.1	0.0521	2.1	< 1	2.1	< 0.2	< 1	< 1
0632	N	1/6/2003	6,861.98	6.61	7.52	7170	637	798	424	9.7	1660	3620	232	0.44	45.2	2.2	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.04	< 0.1	< 0.05	< 0.001	< 0.1	0.0636	1	< 1	1	< 0.2	< 1	1.8
0632	N	4/7/2003	6,862.11	6.29	7.15	7210	607	744	388	12.6	1670	3070	242	0.4	48	2.4	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.22	< 0.1	< 0.05	< 0.001	< 0.1	0.0646	0.8	< 1	0.8	< 0.2	< 1	< 1.0
0632	N	7/7/2003	6,862.04	6.19	6.74	5700	593	726	340	12.2	1700	3330	217	0.42	49.2	0.2	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.27	< 0.1	< 0.05	< 0.001	< 0.1	0.0593	0.8	< 1	0.8	< 0.2	< 1	2
0632	N	10/7/2003	6,861.84	6.18	7.70	7310	644	812	394	9.4	1690	3610	250	0.44	49.5	2.4	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.24	< 0.1	< 0.05	< 0.001	< 0.1	0.07	0.5	< 1	0.5	< 0.2	< 1	1.6
0632	N	1/5/2004	6,861.76	6.36	7.36	7200	652	824	353	10	1720	3700	263	0.44	54.2 D	2.6	0.2	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.44	< 0.1	< 0.05	< 0.001	< 0.1	0.0625 D	1.1	< 1.0	1.1	< 0.2	< 1.0	1.5
0632	N	4/5/2004	6,862.09	6.54	6.63	7320	616	788	364	10.4	1760	3380 D	243	0.67	56.9 D	2.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	0.001	< 0.1	< 0.0008 D	0.5	< 1	0.5	< 0.2	< 1	< 1
0632	N	7/12/2004	6,861.69	6.16	6.77	7400	635	777	420	11.1	1740	3370 D	249	0.49	54.2 D	2	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.35	< 0.1	< 0.05	< 0.001	< 0.1	0.0678 D	1.2	6.4	7.6	< 0.2	< 1.0	1.5
0632	N	10/4/2004	6,861.41	6.19	6.89	7470	738 D	945 D	395	9.3	1750	4020 D	252	0.33	59.5 D	2.6	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.42	< 0.1	< 0.05	< 0.001	< 0.1	0.0652 D	2.3	3.5	5.8	< 0.2	< 1.0	1.1
0632	N	1/3/2005	6,861.60	6.49	6.81	7400	626 D	795 D	387	9.4	1770	3230 D	233	0.45	60.1 D	2.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.45	< 0.1	< 0.05	< 0.001	< 0.1	0.0755	1.4	1.5	2.9	< 0.2	< 1.0	3.2
0632	N	4/5/2005	6,861.45	6.46	7.01	6980	634	811	392	9	1820	3330	237	0.5	60.5	2.7	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.4	< 0.1	< 0.05	< 0.001	< 0.1	0.0768	1.2	< 1.0	1.2	< 0.2	< 1.0	< 1.0
0632	N	7/11/2005	6,861.37	6.36	7.25	7240	610	811 D	389	9.6	1780	3360 D	284	0.53	63.6 D	3.6	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.72	< 0.1	< 0.05	< 0.001	< 0.1	0.0734	1.3	< 1.0	1.3	< 0.2	< 1.0	1.3
0632	N	10/4/2005	6,861.11	6.39	7.03	7210	626 D	792 D	399	9.2	1860	3350 D	244	0.49	58 D	2.9	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.62	< 0.1	< 0.05	< 0.001	< 0.1	0.0880 D	0.6	3.3	3.9	< 0.2	< 1.0	2.4
0632	N	1/9/2006	6,860.99	6.47	7.11	7260	572	772 D	385	8.8	1890	3090 D	232	0.64	66.1 D	2.8	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.98	< 0.1	< 0.05	< 0.001	< 0.1	0.0762	0.9	< 1.0	0.9	< 0.2	< 1.0	1
0632	N	4/3/2006	6,861.04	6.27	7.04	7140	632 D	808 D	391	9.6	1860	3290 D	234	0.64	68.1 D	2.7	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.84	< 0.1	< 0.05	< 0.001	< 0.1	0.0725 D	1.1	< 1.0	1.1	< 0.2	< 1.0	1
0632	N	7/17/2006	6,860.79	6.26	6.63	7070	644 D	829 D	418	10.5	1880	3590 D	241	0.58	67.5 D	2.9	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.98	< 0.1	< 0.05	< 0.001	< 0.1	0.083	0.9	4.3	5.2	< 0.2	< 1.0	< 1.0
0632	N	10/2/2006	6,860.67	6.37	6.66	7120	616 D	784 D	357	10.3	1920	3230 D	188	0.73	64.9 D	2.89	0.2	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2	< 0.1	< 0.05	< 0.001	< 0.1	0.0767 D	1	1.6	2.6	< 0.2	< 1	< 1
0632	N	1/8/2007	6,860.61	6.38	6.66	7430	629 D	813 D	368	11.2	1890	3420 D	236	0.75	69.5 D	3.02	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.98	<0.1	<0.05	<0.001	<0.1	0.0798	0.8	<1	0.8	<0.2	<1	1
0632	N	4/9/2007	6,860.87	6.47	6.64	7190	608 D	782 D	346	12.2	1930	3290 D	240	0.64	75 D	2.59	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	2.13	<0.1	<0.05	<0.001	<0.1	0.0825	0.6	<1	0.6	<0.2	<1	1.4
0632	N	7/9/2007	6,860.59	6.29	6.64	7200	605 D	820 D	410 D	10.9 D	2030	3400 D	140	0.62	78 D	3.56	<0.1	0.01	<0.01	<0.005	<0.01	<0.05	1.99	<0.1	<0.05	<0.001	<0.1	0.0847	0.6	<1	0.6	<0.2	<1	1.4
0632	N	10/2/2007	6,860.32	6.29	6.62	7350	568 D	774 D	388 D	10.9	1970	3210 D	259 D	0.61	70 D	3.57	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	2.35	<0.1	<0.05	<0.001	<0.1	0.0819	0.7	<1	0.7	1.6	<1	2.4
0632	N	1/15/2008	6,860.29	6.39	6.58	7350 H	551 D	738 D	366 D	10.3	1910	3000 D	248 D	0.7	68 D	3.6	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.94	< 0.1	< 0.05	< 0.001	< 0.1	0.0667 D	0.9	< 1	0.9	< 0.2	< 1	2
0632	N	4/7/2008	6,860.49	6.32	6.75	6910	647 D	870 D	436 D	12.6 D	1830	3550 D	231	0.6 D	113 D	3.3	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.29	< 0.1	< 0.05	< 0.001	< 0.1	0.0836	0.8	2.5	3.3	0.6	0 U	1.7
0632	N	7/7/2008	6,860.29	6.16	6.74 H	7090 H	618	802	377 D	9	1910	3500 D	241	0.56	122 D	4.56	< 0.1	< 0.003	< 0.01	< 0.005	< 0.01	< 0.05	2.63	< 0.1	< 0.05	< 0.001	< 0.1	0.0797	0.74	2.6	3.34	0.4	0.5 U	1.5
0632	N	10/6/2008	6,859.79	6.21	6.81	7220	605	826	384 D	9	1870	3760 D	227	0.7	96.3 D	3.03	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.39	< 0.1	< 0.05	< 0.001	< 0.1	0.076	0.57	1.2 U	1.77	-0.9 U	-2 U	0.9
0632	N	1/12/2009	6,859.74	6.23	6.62	7460	598	906	429	10	1920	3290 D	226	0.28	114 D	3.52	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	2.52	<0.1	<0.05	0.001	<0.1	0.0411	0.67	3.2	3.87	-0.3 U	-3 U	1.8
0632	N	4/6/2009	6,859.64	6.29	6.43	7370	580 D	820 D	423 D	9	1960	3460 D	237	0.38	77.3 D	3.96	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	2.63	<0.1	<0.05	0.002	<0.1	0.0801	0.73	1.7	2.43	-0.2 U	-0.5 U	1.4
0632	N	7/6/2009	6,859.59	6.25	6.59	7280 H	628 D	817	393 D	10	1920	3910 D	258	0.74	68 D	2.86	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	2.48	<0.1	<0.05	<0.001	<0.1	0.0718	0.85	2.5	3.35	0.05 U	0.2 U	1.6
0632	N	10/6/2009	6,859.09	6.24	7.37	7240	589 D	776	390 D	9	1970	3610 D	258	0.64	80 D	3.06	0.1	<0.001	<0.01	<0.005	<0.01	<0.05	2.32	<0.1	<0.05	<0.001	<0.1	0.0764	0.99	2.6	3.59	-0.02 U	-2 U	0.5 U
0632	N	1/4/2010	6,858.94	6.35	6.84	7470 D	603 D	786	392 D	10	2010	3650 D	240	0.68	76 D	2.77	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	2.57	<0.1	<0.05	0.002	<0.1	0.074	0.84	2.5	3.34	-0.02 U	-0.9 U	1.4
0632	N	4/5/2010	6,859.09	6.34	6.58	7380 DH	655 D	887	443 D	10	2080	3550 D	483	0.75	78 D	2.96	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	2.37	<0.1	<0.05	0.001	<0.1	0.0786	0.85	2.3	3.15	0.005 U	4.7	0.8
0632	N	7/12/2010	6,858.79	6.37	6.99	7360 D	626 D	820	410 D	10	2030	3330 D	226 D	0.72	70 D	3.6	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	2.76	<0.1	<0.05	<0.001	<0.1	0.0855	0.59	1.2	1.79	0.07 U	0.3 U	0.7 U
0632	N	10/4/2010	6,858.59	6.41	7.42	7400 D	610 D	801	412 D	10	2020	3320 D	218 D	0.66	75 D	2.86	0.2	<0.001	<0.01	<0.005	<0.01	<0.05	2.58	<0.1	<0.05	0.002	<0.1	0.0803	0.54	2	2.54	0.05 U	2.6	1.3
0632	N	1/4/2011	6,858.39	6.38	6.63	6780 D	602 D	818	395 D	9	1930	3380 D	238 D	0.71	64 D	2.76	0.2	<0.001	<0.01	<0.005	<0.01	<0.05	2.95	<0.1	<0.05	0.001	<0.1	0.0947	0.75	2.3	3.05	0.009 U	1.6 U	1.9
0632	N	4/5/2011	6,858.31	6.42	6.63	7230 D	613	802	432 D	10	1910	3440 D	238 D	0.59 D	68 D	3.23	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	2.9	<0.1	<0.05	<0.001	<0.1	0.081	0.65	2.3	2.95	0.07 U	0.3 U	0.9
0632	N	7/11/2011	6,858.16	6.48	7.31	7000 D	630	837	431 D	10	1900	3310 D	228 D	0.7 D	74 D	3.28	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	2.79	<0.1	<0.05	0.002	<0.1	0.0817	0.49	2.2	2.69	0.07 U	0.7 U	1.1
0632	N	10/3/2011	6,857.83	6.50	7.39	7050 D	604	793	406 D	10	1790	3410 D	235 D	0.6 D	70 D	3.16	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	2.64	<0.1	<0.05	<0.001	<0.1	0.0742	0.6	2	2.6	0.02 U	0.8 U	0.8
0632	N	1/3/2012	6,857.77	6.59	6.67 H	7100 D	660	805	407	11	1730	3370 D	236 D	0.44	73 D	3.41	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	2.26	<0.1	<0.05	<0.001	<0.1	0.0686	1.3	1.5	4.3	0.03 U	0.7 U	1.2
0632	N	4/2/2012	6,857.69	6.65	6.54 H	7120 D	622	750	378	10	1860	3380 D	237 D	0.6	71 D	3.52	<0.1	<0.01	<0.01	<0.005	<0.01	<0.05	2.59	<0.1	<0.05	<0.001	<0.1	0.0756	0.56	0.72 U	2	0.05 U	0.3 U	0.9
0632	N	7/9/2012	6,857.39	6.39	6.61 H	7280	603	862	420 D	10	1840	3270 D	227 D	0.52	72 D	2.73	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	2.58	<0.1	<0.05	0.001	<0.1	0.0731	1.2	1.0 U	3.2	0.07 U	0.1 U	1.1
0632	N	10/8/2012	6,857.19	6.51	6.56 H	6770	632	790	402 D	11	1890	3400 D	247 D	0.56	66 D	2.98	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	2.85	<0.1	<0.05	<0.001	<0.1	0.078	0.84	2.2	3.04	0.03 U	0.8 U	1.1
0632	N	1/8/2013	6,857.08	6.47	6.55 H	6830	600	833	433 D	10	1870	3420 D	241 D	0.33	67 D	2.74	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	2.68	<0.1	<0.05	<0.001	<0.1	0.0808	1	1.0 U	1	-0.01 U	0.4 U	1.4
0632	N	4/1/2013	6,857.00	6.49	6.58 H	6840	603	829	413	10	1910	3460 D	253 D	0.39	65 D	3.68	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	2.69	<0.1	<0.05	<0.001	<0.1	0.0864	0.51	1.2 U	0.51	0.04 U	0.3 U	1.7
0632	N	7/8/2013	6,856.81	6.33	6.64 H	7290	584	812	391	9	1880	3350 D	223 D	0.29	64 D	2.82	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	2.57	<0.1	<0.05	<0.001	<0.1	0.0812	0.64	0.91 U	0.64	0.02 U	0.4 U	1.3
0632	N	9/30/2013	6,856.74	6.40	6.53 H	7280 H	578	805	393	10	1910	3380 D	239 D	0.32	63 D	2.82	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	2.63	<0.1	<0.05	<0.001	<0.1	0.0828	0.76	1.6	2.36	0.03 U	0.1 U	0.6
0632	N	1/6/2014	6,856.59	6.70	6.55	6880	585	786	393	10	1890	3290	224	0.3	62	3.08	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	2.66	<0.1	<0.05	<0.001	<0.1	0.0846	0.91	3.1	4.01	0.03	0.8	1.4
0632	N	3/31/2014	6,856.54	6.59	6.50 H	7000	605	807	410 D	10	1870	3340 D	241 D	0.29	63 D	3.93	0.8	<0.001	<0.001	<0.005	<0.01	0.002	2.69	<0.1	<0.05	<0.001	<0.1	0.0886	0.76	1.2	1.96	0.04 U	0.9 U	1.4
0632	N	7/7/2014	6,856.33	6.83	6.57 H	7010	580	758	395 D	10	1870	3410 D	226 D	0.18	58 D	4	0.2	<0.001	<0.001	<0.005	<0.01	<0.001	1.52	<0.1	<0.05	<0.001	<0.1	0.0622	0.74	5.1	5.84	0.1 U	0.9 U	0.5
0632	N	10/6/2014	6,856.14	6.52	6.57 H	7030	584	803	398	10	1870	3490 D	254 D	0.34	59 D	3.54	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	2.82	<0.1	<0.05	<0.001	<0.1	0.0807	1	1.3 U	1	0.02 U	1.2 U	1.1
0632	N	1/5/2015	6,856.05	6.65	6.64 H	7230	579	788	393	10	1810	3230 D	222 D	0.29	58 D	3.51	0.1	<0.001	<0.001	<0.005	<0.01	<0.001	2.86	<0.1	<0.05	<0.001	<0.1	0.0834	0.92	3.1	4.02	0.0 U	1.4	2.7
0632	N	4/6/2015	6,855.91	6.49	6.54 H	6970	557	783	388	10	1850	3560 D	260 D	0.13	57 D	4.08	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.77	<0.1	<0.05	<0.001	<0.1	0.0742	0.99	1.8	2.79	0.02 U	0.4 U	4.3
0632	N	7/6/2015	6,855.76	6.38	6.54 H	7230	521	768	390	11	1900	3510 D	241 D	0.24	54 D	3.48	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.99	<0.1	<0.05	<0.001	<0.1	0.074	0.71	2.2	2.91	0.2 U	0.9 U	1.2 U
0632	N	10/5/2015	6,855.51	6.53	6.56 H	7010	568	771	378	9	1740	3550 D	256 D	0.24	50 D	3	0.2	<0.001	<0.001	<0.005	<0.01	0.001	2.72	<0.1	<0.05	<0.001	<0.1	0.0634	1.1	1.7	2.8	0.03 U	0.8 U	5.8
0632	N	1/4/2016	6,855.44	6.59	6.49 H	7010	578	787	380	9	1880	3520 D	249 D	0.12	52 D	1.68	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	2.72	<0.1	<0.05	<0.001	<0.1	0.0744	0.9	1.3	2.2	-0.01 U	-0.05 U	0.6 U
0632	N	4/4/2016	6,855.26	6.41	6.60 H	7090	585	786	406	9	1800	3380 D	239 D	0.1	50 D	1.29	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	2.81	<0.1	<0.05	<0.001	<0.1	0.0754	0.84	3.3	4.14	0.03 U	0.4 U	4
0632	N	7/11/2016	6,855.09	6.49	6.55 H	7000 D	570	801	396 D	10	1820	3180 DH	231 DH	<0.05	54 D	1.15	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	2.07	<0.1	<0.05	<0.001	<0.1	0.0688	0.69	2.3	2.99	-0.007 U	0.4 U	1.4 U

TABLE A.1

Southwest Alluvium Data Summary, 1989-2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
0632	N	10/3/2016	6,854.84	6.58	6.54 H	6780 H	546	787	389	10	2120	3130 D	184 D	<0.05	49 DH	0.84	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.92	<0.1	<0.05	<0.001	<0.1	0.0597	0.65	7.3	7.95	0.04 U	-0.3 U	5.5
0632	N	1/9/2017	6,854.64	6.57	6.58 H	6660 D	541	792	387	10	1810	3470 D	237 D	0.13	52 D	0.58	0.2	<0.001	<0.001	<0.005	<0.01	0.002	2.69	<0.1	<0.05	<0.001	<0.1	0.0681	0.58	2.2	2.78	0.06 U	-0.6 U	1.2 U
0632	N	4/3/2017	6,854.62	6.45	6.58 H	6680 D	545	737	387 D	10	1780	3580 D	248 D	0.09	49 D	0.8	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.77	<0.1	<0.05	<0.001	<0.1	0.0719	0.81	1.4	2.21	0.1 U	0.7 U	2.8
0632	N	7/10/2017	6,854.36	6.46	6.57 H	6710 D	556	808	402 D	9	1740	3150 D	222 D	0.09	46.0 D	0.64	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.56	<0.1	<0.05	<0.001	<0.1	0.0652	0.9	2.5	3.4	0.04 U	1.3 U	1.1
0632	N	10/2/2017	6,854.11	6.49	6.60 H	6510 D	547	789	378 D	10	1820	3220 D	243 D	0.1	43.0 D	0.66	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	2.4	<0.1	<0.05	<0.001	<0.1	0.0759	0.5	1.6	2.1	0.09 U	1.6	1.3
0632	N	1/8/2018	6,853.87	6.68	6.57 H	6930 D	566	752	377 D	9	1660	3520 D	237 D	0.3 D	43.0 D	0.77	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	3.47 D	<0.001	0.015	<0.001	<0.01	0.078	0.7	1.9	2.6	0.04 U	0.3 U	1.1
0632	N	4/2/2018	6,853.87	6.47	6.51 H	6930 D	645 D	702	371 D	9	1710	3560 D	257 D	<0.05	44 D	0.65	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	3.31	<0.001	0.014	<0.001	<0.01	0.0765	1	2.4	3.4	0.06 U	0.9 U	2.2
0632	N	7/9/2018	6,853.59	6.47	6.57 H	6910 D	558 D	737	351 D	9 D	1730	3350 D	244 D	<0.05	45.0 D	0.57	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	3.2	<0.001	0.015	<0.001	<0.01	0.0719	0.8	1.9	2.7	0.02 U	0.7 U	0.9
0632	N	10/1/2018	6,853.29	6.52	6.53 H	7000 D	572	724	369 D	10	1730	3480 D	242 D	<0.05	41.5 D	0.58	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	3.12	<0.001	0.014	<0.001	<0.01	0.0693	0.6	2.7	3.3	0.04 U	0.3 U	1.8
0632	N	1/7/2019	6,853.22	6.49	6.54 H	6840 D	593	799	416 D	11	1740	3470 D	236 D	<0.05	36.2 D	0.6	<0.03	no data	<0.001	<0.001	<0.005	<0.001	2.51	<0.001	0.013	no data	<0.01	0.072	0.9	0.3 U	1.2	0.01 U	1.6	1.3
0632	N	4/8/2019	6,853.13	6.45	6.55 H	6830 D	551	722	405	10	1740	3520 D	239 D	<0.05	37.4 D	0.59	0.06	0.003	<0.001	<0.001	<0.005	<0.001	3.23	<0.001	0.018	<0.001	0.02	0.0666	0.5	1.8	2.3	0.02 U	3.2	1
0632	N	7/15/2019	6,852.99	6.53	6.58 H	6850 D	543	716	359	9	1750	3470 D	235 D	<0.05	38 D	0.54	0.08	<0.001	<0.001	<0.001	<0.005	<0.001	3.15 D	<0.001	0.014	<0.001	<0.01	0.0716 D	1.1	4	1.5	0.06 U	4	1.4
0632	N	10/9/2019	6,852.65	6.64	6.59 H	6810 DH	553	752	383	10	1730	3530 D	245 D	<0.2 D	36.5 D	0.72	0.04	<0.001	<0.001	<0.001	<0.005	<0.001	2.12 D	<0.001	0.011	<0.001	<0.01	0.0713	0.6	1.2 U	1.8	0.08 U	4.6	1.5
0639	N	7/23/1989	6,940.70	6.90	7.16	3752	366	390	168	4.2	390	2319	33.9	0.09	3.6	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.01	< 0.05	1.8	< 0.1	< 0.05	0.001	< 0.1	0.174	0.3	< 1	0.3	< 0.2	< 1	2.5
0639	N	10/8/1989	6,940.30	6.60	7.40	4076	410	375	177	6.6	448	2508	34.2	0.06	4	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.27	< 0.1	< 0.05	0.001	< 0.1	0.291	1.8	< 1	1.8	14.3	< 1	17.8
0639	N	1/11/1990	6,939.60	6.70	7.13	4734	444	478	186	5.55	497	2830	37.5	0.11	3.4	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.04	< 0.05	0.41	< 0.1	< 0.05	< 0.001	< 0.1	0.276	< 0.2	< 1	0	3.4	10.3	4
0639	N	4/10/1990	6,939.00	6.70	7.48	5351	467	590	193	5.6	565	3153	40.1	0.11	3.3	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.56	< 0.1	< 0.05	0.002	< 0.1	0.096	1.3	1.2	2.5	< 0.2	< 1	1.7
0639	N	7/10/1990	6,938.60	6.70	7.08	5461	419	583	194	5.1	583	3265	39	< 0.05	3	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.89	< 0.1	< 0.05	0.001	< 0.1	0.2416	< 0.2	< 1	0	< 0.2	< 1	< 1
0639	N	10/9/1990	6,938.40	6.70	7.59	4043	305	464	176	6.5	516	2452	27.1	< 0.05	2.05	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.02	< 0.05	0.99	< 0.1	< 0.05	< 0.001	< 0.1	0.2623	< 0.2	1.3	1.3	< 0.2	1.9	< 1
0639	N	1/17/1991	6,938.00	6.20	7.25	4672	382	508	178	6.3	508	2944	32	< 0.05	2	< 1	0.12	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.34	< 0.1	< 0.05	0.002	< 0.1	0.1984	1.4	< 1	1.4	< 0.2	< 1	1.9
0639	N	4/10/1991	6,937.80	6.50	7.51	4523	347	531	173	7.8	551	2690	29.2	< 0.05	4.8	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.14	< 0.1	< 0.05	0.002	< 0.1	0.196	< 0.2	< 1	0	< 0.2	< 1	< 1
0639	N	7/10/1991	6,937.40	6.50	7.26	4877	309	449	150	5.6	555	3046	27.6	< 0.05	3.3	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.01	< 0.05	1.47	< 0.1	< 0.05	0.035	< 0.1	0.2739	1	< 1	1	< 0.2	< 1	1
0639	N	10/17/1991	6,937.00	6.40	7.37	4899	412	531	158	7.1	626	2803	40.8	< 0.05	4.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.48	< 0.1	< 0.05	0.002	< 0.1	0.272	0.2	< 1	0.2	< 0.2	< 1	< 1
0639	N	1/21/1992	6,936.80	6.40	7.20	4330	409	510	153	5.3	620	2792	29.4	< 0.05	2.93	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.27	< 0.1	< 0.05	0.002	< 0.1	0.17	0.7	1.8	2.5	< 0.2	2.2	< 1
0639	N	4/13/1992	6,936.70	6.30	7.54	5005	363	499	165	6.1	618	2922	33.5	< 0.05	3.31	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.59	< 0.1	< 0.05	0.006	< 0.1	0.367	2.1	2.8	4.9	< 0.2	3.3	2.2
0639	N	7/14/1992	6,936.50	6.30	7.36	4857	393	507	175	6.6	616	2845	28	< 0.05	3.74	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.41	< 0.1	< 0.05	0.002	< 0.1	0.245	0.3	1.6	1.9	< 0.2	1.9	< 1
0639	N	10/13/1992	6,936.40	6.40	7.55	4661	335	437	154	6.6	619	2801	27	0.13	2.1	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.51	< 0.1	< 0.05	0.003	< 0.1	0.223	0.8	3.5	4.3	< 0.2	< 1	< 1
0639	N	1/21/1993	6,936.10	6.50	7.09	3924	340	416	131	5.8	570	2359	23.3	0.15	2	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.07	< 0.1	< 0.05	0.002	< 0.1	0.094	< 0.2	4.1	4.1	< 0.2	3.9	< 1
0639	N	4/14/1993	6,936.00	6.60	7.85	3417	301	343	123	3.7	561	1988	18.6	0.07	2	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.67	< 0.1	< 0.05	0.003	< 0.1	0.08	6	6	12	< 0.2	< 1	6.4
0639	N	7/15/1993	6,935.70	6.60	6.91	3046	300	300	123	6.9	576	1959	19.2	0.19	1.63	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.44	< 0.1	< 0.05	0.009	< 0.1	0.109	0.2	< 1	0.2	< 0.2	< 1	< 1
0639	N	10/6/1993	6,934.60	6.60	6.76	3060	264	321	115	3.6	539	1862	16.8	< 0.05	2.3	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.15	< 0.1	< 0.05	0.003	< 0.1	0.071	3	1.9	4.9	< 0.2	2	5.8
0639	N	1/5/1994	6,935.60	6.50	7.38	3018	323	325	104	3.3	559	1781	17	0.22	1.38	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.71	< 0.1	< 0.05	< 0.001	< 0.1	0.107	3.8	< 1	3.8	< 0.2	3.2	4.8
0639	N	4/13/1994	6,935.30	6.70	7.10	3058	303	304	104	2.8	458	1862	15.8	0.18	1.31	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.18	< 0.1	< 0.05	0.002	< 0.1	0.11	0.3	< 1	0.3	< 0.2	7.2	< 1
0639	N	10/5/1994	6,935.50	6.60	7.99	3396	368	348	119	2.6	373	2142	16.3	0.15	1.61	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.8	< 0.1	< 0.05	< 0.001	< 0.1	0.07	< 0.2	7	7	< 0.2	< 1	10.8
0642	N	7/23/1989	6,928.10	6.90	7.36	4083	675	233	179	2.7	405	2209	37.1	0.13	80	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.01	< 0.1	< 0.05	0.002	< 0.1	0.0356	0.7	< 1	0.7	5.4	< 1	4.3
0642	N	10/8/1989	6,927.50	6.80	7.40	4140	634	227	177	3.6	414	2182	37.9	0.08	93	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	0.002	< 0.1	0.083	2.8	1.2	4	3.6	< 1	6.4
0642	N	1/11/1990	6,926.50	6.80	7.20	4080	628	229	174	2.61	421	2176	26.5	0.06	85	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	0.001	< 0.1	0.001	< 0.2	< 1	0	0.2	< 1	1
0642	N	4/10/1990	6,925.70	6.80	7.50	4161	634	250	171	2.4	430	2129	35.7	0.12	75	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.01	< 0.05	0.1	< 0.1	< 0.05	0.002	< 0.1	0.036	4.7	< 1	4.7	4.3	< 1	0.4
0642	N	7/10/1990	6,924.80	6.90	7.30	4232	714	263	171	1.9	426	2209	34	< 0.05	83.4	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.02	< 0.05	< 0.01	< 0.1	< 0.05	0.002	< 0.1	0.055	< 0.02	< 1	0	< 0.2	< 1	< 1
0642	N	10/9/1990	6,924.10	6.70	7.62	4168	582	242	174	3.2	415	2319	34.4	< 0.05	66.9	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.02	< 0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.0446	< 0.2	< 1	0	< 0.2	< 1	< 1
0642	N	1/17/1991	6,923.50	6.70	7.58	4131	676	268	181	2.4	414	2323	35.1	< 0.05	61.5	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	< 0.001	< 0.1	0.0357	< 0.2	< 1	0	< 0.2	< 1	< 1
0642	N	4/10/1991	6,922.80	6.80	7.84	4110	623	273	162	4.4	432	2216	34.1	< 0.05	87	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.01	< 0.05	< 0.01	< 0.1	< 0.05	0.001	< 0.1	0.0363	< 0.2	< 1	0	< 0.2	3	< 1
0642	N	7/10/1991	6,922.20	6.70	7.49	4089	625	257	155	2.8	423	2309	33.1	< 0.05	68.1	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.02	< 0.05	< 0.01	< 0.1	< 0.05	0.004	< 0.1	0.0557	0.8	< 1	0.8	< 0.2	3.2	< 1
0642	N	10/17/1991	6,921.60	6.70	7.52	4093	639	233	167	3.6	442	2229	34.5	< 0.05	55.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	< 0.03	< 0.1	< 0.05	0.002	< 0.1	0.04	0.3	< 1	0.3	< 0.2	< 1	< 1
0642	N	1/21/1992	6,920.60	6.80	7.35	4133	684	223	158	2.4	425	2307	75	< 0.05	38.1	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	0.002	< 0.1	0.029	0.5	< 1	0.5	< 0.2	< 1	< 1
0642	N	4/13/1992	6,920.00	6.70	7.43	4096	562	238	185	3.1	399	1851	31.5	< 0.05	29	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.02	< 0.05	0.04	< 0.1	< 0.05	0.002	< 0.1	0.108	0.5	< 1	0.5	< 0.2	< 1	< 1
0642	N	7/14/1992	6,919.30	6.40	7.72	4196	668	266	183	3.2	405	2518	28.4	< 0.05	46	< 1	< 0.1	0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.05	< 0.1	< 0.05	0.003	< 0.1	0.05	0.4	1.1	1.5	< 0.2	< 1	< 1
0642	N	10/13/1992	6,918.50	6.80	7.59	3909	617	260	169	3	422	2721	29	< 0.05	45.9	< 1	< 0.1	0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.03	< 0.1	< 0.05	0.001	< 0.1	0.055	0.3	3	3.3	< 0.2	< 1	< 1
0642	N	1/21/1993	6,917.60	6.90	7.52	4295	642	268	157	3.5	422	2575	31.6	< 0.05	32.8	< 1	< 0.1	0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.05	< 0.1	< 0.05	0.003	< 0.1	0.046	0.4	< 1	0.4	< 0.2	2.7	1.3
0642	N	4/14/1993	6,917.00	7.00	7.95	4460	640	283	166	2.2	453	2621	30.4	< 0.05	35.1	< 1	< 0.1	< 0.001	< 0.001	< 0.01	< 0.01	< 0.05	0.16	< 0.1	< 0.05	0.001	< 0.1	0.06	0.7	< 1	0.7	< 0.2	< 1	< 1
0642	N	7/15/1993	6,916.20	7.00	7.02	4023	598	266	182	5.1	478	2657	33	0.08	2.2	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.1	< 0.1	< 0.05	0.003	< 0.1	0.051	0.5	< 1	0.5	< 0.2	< 1	< 1
0642	N	10/6/1993	6,912.90	7.10	7.10	4659	598	325	192	2.2	432	2849	28.6	< 0.05	29.5	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.036	0.5	1.3	1.8	< 0.2	< 1	< 1
0642	N	1/5/1994	6,915.00	7.10	7.68	4362	580	326	150	2.8	450	2709	29.5	< 0.05	22.3	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.046	0.4	< 1	0.4	< 0.2	3.1	< 1
0642	N	4/13/1994	6,914.40	7.10	7.33	4446	610	334	149	2.8	442	2782	30	0.18	21.2	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.07	< 0.1	< 0.05	0.003	< 0.1	0.043	0.9	< 1	0.9	< 0.2	2.7	< 1
0642	N	7/21/1994	6,913.70	7.10	7.37	4667	789	374	164	4.1	471	3117	27.3	0.08	21.3	< 1	< 0.1	0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.12	< 0.1	< 0.05	0.006	< 0.1	0.038	0.8	4.6	5.4	< 0.2	3.5	5.3
0642	N	10/5/1994	6,913.30	7.00	7.70	4699	649	377	178	4.5	490	2863	29.8	0.11	20.6	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.08	< 0.1	< 0.05	< 0.001	< 0.1	0.039	0.7	1.7	2.4	< 0.2	3.9	3.4
0642	N	1/5/1995	6,912.60	7.00	7.57	4800	630	379	163	5.2	505	2823	30.7	0.17	18.2	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.08	< 0.1	< 0.05	< 0.001	< 0.1	0.038	1.3	< 1	1.3	< 0.2	< 1	1.5
0642	N	4/5/1995	6,912.60	7.00	7.44	4804	583	390	156	3.9	519	2869	30	0.2	17	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.09	< 0.1	< 0.05	0.002	< 0.1	0.042	3.4	2.9	6.3	< 0.2	2.8	7.9
0642	N	7/6/1995	6,911.60	7.00	7.99	4613	605	377	167	5.3	527	2781	29	< 0.05	20.7	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.14	< 0.1	< 0.05	0.003	< 0.1	0.0549	0.6	< 1	0.6	< 0.2	1.2	4.8

TABLE A.1
Southwest Alluvium Data Summary, 1989-2019
United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	NA	8.2	4.5	5.9	15
0642	N	10/4/1995	6,911.80	7.00	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
0644	N	7/23/1989	6,936.30	7.30	7.52	4441	769	206	187	5.2	498	1812	72.9	0.07	178	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.02	< 0.1	< 0.05	0.013	< 0.1	0.0652	0.5	< 1	0.5	< 0.2	1.2	1.7
0644	N	10/8/1989	6,935.70	6.80	7.50	4778	860	227	203	5.8	676	1776	89.3	0.1	300	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.07	< 0.1	< 0.05	0.018	< 0.1	0.093	0.4	< 1	0.4	0.7	< 1	< 1
0644	N	1/11/1990	6,935.00	6.70	7.16	4994	860	254	220	4.15	653	1789	99	0.07	384	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.03	< 0.1	< 0.05	0.011	< 0.1	0.071	0.3	< 1	0.3	1.2	< 1	4.2
0644	N	4/10/1990	6,934.30	6.80	7.52	5426	854	260	222	4.2	623	1669	100	0.11	396	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.04	< 0.1	< 0.05	0.007	< 0.1	0.069	0.7	1.4	2.1	< 0.2	< 1	1.2
0644	N	7/10/1990	6,933.80	6.80	7.24	6272	855	274	236	3.7	633	1706	94.8	< 0.05	615	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.01	< 0.05	0.04	< 0.1	< 0.05	0.007	< 0.1	0.11	0.6	< 1	0.6	< 0.2	< 1	< 1
0644	N	10/9/1990	6,933.00	6.70	7.68	5576	809	280	232	5.1	586	1689	97.4	< 0.05	377	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.02	< 0.05	0.04	< 0.1	< 0.05	0.004	< 0.1	0.0656	< 0.2	< 1	0	< 0.2	< 1	< 1
0644	N	1/17/1991	6,932.50	6.60	7.28	5447	922	294	242	5.6	526	1731	97	< 0.05	512	< 1	0.14	< 0.001	< 0.01	< 0.01	0.01	< 0.05	0.07	< 0.1	< 0.05	0.002	< 0.1	0.0627	< 0.2	6.6	6.6	< 0.2	1.3	< 1
0644	N	4/10/1991	6,932.10	6.60	7.80	5265	855	293	244	6.2	616	1661	99.5	0.05	435	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.02	< 0.05	0.07	< 0.1	< 0.05	0.005	< 0.1	0.0608	0.4	1.9	2.3	< 0.2	3.8	< 1
0644	N	7/10/1991	6,931.70	6.70	7.55	5991	845	272	218	4.2	586	1852	96.2	0.06	534	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.02	< 0.05	0.05	< 0.1	< 0.05	0.007	< 0.1	0.1133	0.6	< 1	0.6	< 0.2	< 1	< 1
0644	N	10/17/1991	6,931.00	6.60	7.50	5606	929	291	251	7	617	1839	111	< 0.05	401	< 1	0.14	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.07	< 0.1	< 0.05	0.008	< 0.1	0.078	0.6	< 1	0.6	< 0.2	4.9	< 1
0644	N	1/21/1992	6,930.50	6.70	7.40	4715	794	280	225	4.1	591	1896	98	< 0.05	234	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.08	< 0.1	< 0.05	0.004	< 0.1	0.042	1.8	3	4.8	< 0.2	< 1	2
0644	N	4/13/1992	6,930.00	6.60	7.40	5318	786	271	268	5.5	539	1851	103	0.08	244	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.12	< 0.1	< 0.05	0.008	< 0.1	0.043	1.6	< 1	1.6	< 0.2	< 1	1.8
0644	N	7/14/1992	6,929.00	6.30	7.38	5770	824	270	285	6.6	464	1884	92.1	< 0.05	338	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.15	< 0.1	< 0.05	0.005	< 0.1	0.08	0.8	3.1	3.9	< 0.2	< 1	< 1
0644	N	10/13/1992	6,929.00	6.70	7.34	5731	771	263	241	5.4	488	2121	97.5	0.07	250	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.15	< 0.1	< 0.05	0.012	< 0.1	0.109	2.2	< 1	2.2	< 0.2	< 1	2.3
0645	N	10/8/1989	6,941.30	7.10	7.40	7992	957	440	518	6.9	378	1982	159	0.13	798	< 1	< 0.1	< 0.001	< 0.05	0.052	< 0.01	< 0.05	1.2	< 0.1	< 0.05	0.04	< 0.1	0.068	< 0.2	< 1	0	< 0.2	< 1	< 1
0645	N	1/11/1990	6,940.80	6.70	7.18	8426	929	539	574	4.48	354	2299	168	0.14	926	< 1	< 0.1	< 0.001	< 0.05	0.074	< 0.01	< 0.05	1.3	< 0.1	< 0.05	0.022	< 0.1	0.038	0.2	< 1	0.2	< 0.2	< 1	1.1
0645	N	4/10/1990	6,940.60	6.90	7.54	9179	917	600	560	4.2	369	2489	169	0.13	840	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.01	< 0.05	0.9	< 0.1	< 0.05	0.022	< 0.1	0.041	0.4	1.1	1.5	< 0.2	< 1	1
0645	N	7/10/1990	6,940.00	7.00	7.28	10530	829	680	637	4.2	365	2728	157	< 0.05	1225	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.72	< 0.1	< 0.05	0.018	< 0.1	0.052	< 0.2	< 1	0	1.1	< 1	1
0645	N	10/10/1990	6,940.00	6.90	7.41	9343	742	604	644	4.6	351	2674	150	0.09	800	< 1	< 0.1	< 0.001	< 0.05	0.068	0.01	< 0.05	0.54	< 0.1	< 0.05	0.016	< 0.1	< 0.034	< 0.2	1.6	1.6	< 0.2	< 1	< 1
0645	N	1/17/1991	6,939.80	6.90	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
0645	N	4/10/1991	6,939.60	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
0801	N	10/17/1989	6,873.40	6.50	6.69	9214	626	1102	472	23	1940	4591	246	33.6	26	1.8	< 0.1	< 0.001	< 0.05	< 0.01	0.48	< 0.05	31	< 0.01	0.31	< 0.001	< 0.1	0.0636	1.1	< 1	1.1	1.6	2.4	3.1
0801	N	1/11/1990	no data	6.50	6.74	8830	628	997	470	14.9	2111	4416	262	25.1	62	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.13	< 0.05	19	< 0.1	0.14	< 0.001	< 0.1	0.057	0.7	< 1	0.7	2.3	< 1	4
0801	N	4/5/1990	no data	6.80	7.16	5543	774	852	500	9.1	2103	2946	228	9.3	115	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.02	< 0.05	5.8	< 0.1	0.15	0.001	< 0.1	0.099	0.6	< 1	0.6	< 0.2	< 1	1
0801	N	7/9/1990	no data	6.50	6.82	9507	626	1095	436	15.5	2020	4826	254	40	39.6	1.92	0.19	< 0.001	< 0.05	< 0.01	0.08	< 0.05	31.6	< 0.1	0.17	0.001	< 0.1	0.071	< 0.2	< 1	0	< 0.2	< 1	< 1
0801	N	10/3/1990	no data	6.30	7.09	9800	565	1187	493	15.3	1875	5090	269	34.6	21.1	1.6	< 0.1	< 0.001	< 0.05	< 0.01	0.18	< 0.05	39.6	< 0.1	0.13	< 0.001	< 0.1	0.037	1	< 1	1	< 0.2	< 1	< 1
0801	N	1/3/1991	no data	6.10	6.84	9316	628	1232	482	23.6	1930	4650	239	32.4	31.4	2.72	0.59	< 0.001	< 0.01	0.01	0.2	< 0.05	32.4	< 0.1	0.17	< 0.001	< 0.1	0.0654	1.8	< 1	1.8	< 0.2	< 1	2
0801	N	4/11/1991	no data	6.10	7.09	9510	601	1092	415	16.6	1991	4788	274	30	27.5	3.4	0.19	< 0.001	< 0.01	< 0.01	0.13	< 0.05	30.1	< 0.1	0.13	< 0.001	< 0.1	0.047	1.1	< 1	1.1	< 0.2	< 1	1
0801	N	7/11/1991	no data	6.30	7.08	9566	620	1142	410	12.8	1872	5121	240	40	26.5	3.5	0.12	< 0.001	< 0.01	< 0.01	0.08	< 0.05	32	< 0.1	< 0.05	0.001	< 0.1	0.1228	1.6	2.3	3.9	< 0.2	2.4	2
0801	N	10/23/1991	no data	6.30	7.08	9049	566	1127	432	13.1	1870	4508	271	27.7	10.1	3.3	0.63	< 0.001	< 0.01	< 0.01	0.09	no data	34	< 0.1	0.1	< 0.001	< 0.1	0.186	0.5	4.8	5.3	< 0.2	< 1	< 1
0801	N	1/16/1992	no data	6.20	7.28	8346	502	961	441	13	1825	4891	247	41.5	13.6	3.6	< 0.1	< 0.001	< 0.01	< 0.01	0.11	< 0.05	32.5	< 0.1	0.12	0.005	< 0.1	0.031	0.3	3.7	4	< 0.2	1.5	< 1
0801	N	4/13/1992	no data	6.20	7.11	9240	518	635	444	15.1	1869	4650	255	31.7	12.8	4.2	0.18	< 0.001	< 0.01	< 0.01	0.09	< 0.05	31.3	< 0.1	0.1	0.005	< 0.1	0.034	0.5	1	1.5	< 0.2	< 1	< 1
0801	N	7/8/1992	no data	6.10	7.38	8276	635	634	539	16	1915	4512	246	28.1	38.1	3	0.23	< 0.001	< 0.01	< 0.01	0.03	< 0.05	24.3	< 0.1	< 0.05	0.001	< 0.1	0.04	0.9	< 1	0.9	< 0.2	< 1	< 1
0801	N	10/8/1992	no data	6.40	7.72	9244	517	1003	478	17.4	1832	5132	229	39.5	14.7	3.8	0.3	< 0.001	< 0.01	< 0.01	0.06	< 0.05	37	< 0.1	0.07	< 0.001	< 0.1	0.022	1.7	< 1	1.7	< 0.2	< 1	1.9
0801	N	1/7/1993	no data	6.30	7.28	8060	555	1030	469	14.1	1575	4709	249	42.8	9.9	4.6	< 0.1	< 0.001	< 0.01	< 0.01	0.12	< 0.05	45.3	< 0.1	< 0.05	0.006	< 0.1	0.03	0.7	< 1	0.7	< 0.2	< 1	< 1
0801	N	4/7/1993	no data	6.40	7.19	8253	476	955	472	12.1	1603	4867	247	43.9	10.2	4	< 0.1	< 0.001	< 0.001	< 0.01	0.11	< 0.05	45.1	< 0.1	0.16	< 0.001	< 0.1	0.069	0.4	< 1	0.4	< 0.2	1.8	< 1
0801	N	7/14/1993	no data	6.40	6.93	8158	555	1011	432	13	1709	4887	247	34	14.7	4.5	< 0.1	< 0.001	< 0.01	< 0.01	0.08	< 0.05	30	< 0.1	0.1	< 0.001	< 0.1	0.028	0.7	3.8	4.5	< 0.2	< 1	< 1
0801	N	10/7/1993	no data	6.30	7.08	7688	525	931	393	12.6	1641	4231	229	32	19	3.5	< 0.1	< 0.001	< 0.01	< 0.01	0.09	< 0.05	31.9	< 0.1	< 0.05	< 0.001	< 0.1	0.035	1.5	3.3	4.8	< 0.2	< 1	2
0801	N	1/6/1994	no data	6.40	6.82	7788	522	909	438	12.6	1540	4519	230	32.3	28.6	4.3	0.7	< 0.001	< 0.01	< 0.01	0.09	< 0.05	33.4	< 0.1	0.09	< 0.001	< 0.1	0.047	1.3	1	2.3	< 0.2	< 1	3.9
0801	N	4/12/1994	no data	6.40	6.80	8786	515	905	415	12.8	1454	5061	233	42.7	9.9	2.7	0.36	< 0.001	< 0.01	< 0.01	0.12	< 0.05	34.3	< 0.1	0.15	< 0.001	< 0.1	0.039	0.9	< 1	0.9	< 0.2	3.2	< 1
0801	N	7/27/1994	no data	6.40	7.24	8502	599	902	382	13.3	1530	4930	222	35.6	25.2	4.2	< 0.1	< 0.001	< 0.01	< 0.01	0.1	< 0.05	20.5	< 0.1	0.09	0.001	< 0.1	0.036	1.1	5.2	6.3	< 0.2	1.9	5.5
0801	N	10/5/1994	no data	6.20	7.29	8093	564	998	440	13.1	1619	4544	236	29.9	10.7	3.25	0.44	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	20.4	< 0.1	0.07	< 0.001	< 0.1	0.036	0.8	1.7	2.5	< 0.2	1	3.5
0801	N	1/4/1995	no data	6.20	6.97	8714	635	945	425	14.7	1599	4925	226	45	9.57	3.58	0.51	< 0.001	< 0.01	< 0.01	0.06	< 0.05	31.5	< 0.1	0.09	< 0.001	< 0.1	0.034	1.2	< 1	1.2	< 0.2	< 1	2.9
0801	N	4/6/1995	no data	6.20	6.70	8297	560	910	402	13.1	1652	4455	258	31.8	10.2	2.28	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	23.4	< 0.1	< 0.05	< 0.001	< 0.1	0.039	1.6	2.4	4	< 0.2	1.9	5.4
0801	N	7/6/1995	no data	6.30	7.64	8028	535	883	405	13.7	1627	4335	230	30.4	8.82	4.11	< 0.1	< 0.001	< 0.01	< 0.01	0.03	< 0.05	23	< 0.1	< 0.05	0.001	< 0.1	0.0435	1.5	1.5	3	0.3	< 1	4.8
0801	N	10/4/1995	no data	6.30	7.29	8115	535	890	406	12.1	1619	4668	212	24.4	11	2.91	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	18.1	< 0.1	< 0.05	< 0.001	< 0.1	0.038	1.3	< 1	1.3	0.6	< 1	1.1
0801	N	1/3/1996	no data	6.50	7.18	7962	629	952	414	12.3	1620	4640	242	16.8	9.91	2.81	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	18.6	< 0.1	< 0.05	< 0.001	< 0.1	0.042	1.3	< 1	1.3	< 0.2	3.1	2
0801	N	4/2/1996	no data	6.50	7.31	8061	550	1000	408	13	1623	4370	224	21.5	9.08	3.36	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	17	< 0.1	< 0.05	< 0.001	< 0.1	0.063	0.3	< 1	0.3	< 0.2	2.9	3
0801	N	7/17/1996	no data	6.30	6.79	8133	527	864	411	15.1	1532	4100	241	20.6	8.22	4.32	< 0.1	< 0.001	< 0.01	< 0.01	0.01	< 0.05	19.5	< 0.1	< 0.05	< 0.001	< 0.1	0.051	0.9	< 1	0.9	1.1	< 1	1.2
0801	N	10/8/1996	no data	6.30	6.97	8130	554	915	404	13.9	1520	4325	233	19.9	4.46	3.6	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	17.1	< 0.1	< 0.05	< 0.001	< 0.1	0.046	1.3	< 1	1.3	< 0.2	< 1	< 1
0801	N	1/28/1997	no data	6.50	7.73	8340	555	906	361	13.8	1678	4460	324	22.2	3.75	3.49	< 0.1	< 0.001	< 0.01	< 0.01	0.02	< 0.05	19.4	< 0.1	0.06	< 0.001	< 0.1	0.028	2.4	< 1	2.4	< 0.2	6.3	1.2
0801	N	4/8/1997	no data	6.40	7.57	8190	562	944	399	14.5	1520	4500	232	21.2	6.33	3.5	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	20.2	< 0.1	< 0.05	< 0.001	< 0.1	0.04	0.9	< 1	0.9	< 0.2	< 1	< 1
0801	N	7/8/1997	no data	6.60	7.43	8240	575	956	420	15	1520	4480	243	21.2	6.43	3.42	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	17	< 0.1	< 0.05	< 0.001	< 0.1	0.039	1.2	3.3	4.5	< 0.2	< 1	< 1
0801	N	10/8/1997	no data	6.20	7.51	8100	568	924	379	13.8	1520	4350	273	21.1	5.06	4.06	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	21.8	< 0.1	< 0.05	< 0.001	< 0.1	0.039	1	< 1	1	< 0.2	< 1	< 1
0801	N	1/20/1998	no data	6.20	7.72	8090	553	898	397	14.9	1500	4400	269	21	7.07	4.1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	19.7	< 0.1	< 0.05	< 0.001	< 0.1	0.043	1.3	< 1	1.3	< 0.2	< 1	< 1
0801	N	4/7/1998	no data	6.50	7.42	8140	553	915	375	13.3	1480	4260	214	20.4	7.42	3.9	< 0.1	< 0.001	0.01	< 0.005	< 0.01	< 0.05	16.5	< 0.1	0.75	< 0.001	< 0.1	0.0439	1.2	< 1	1.2	< 0.2	< 1	< 1
0801	N	7/7/1998	no data	6.60	7.42	8250	563	969	407	14.1	1450	4200	233	22.5	4.86	3.9	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	20.8	< 0.1	< 0.05	< 0.001	< 0.1	0.0411	1.6	1.7	3.3	< 0.2	< 1	< 1
0801	N	10/6/1998	no data	6.40	7.58	8040	546	924	401	14.7	1440	4300	250	23.2	6.56	1.3	< 0.1	< 0.001	< 0.01	0.005	< 0.01	< 0.05	17.3	< 0.1	< 0.05	< 0.001	< 0.1	0.0262	1.2	< 1	1.2	< 0.2	< 1	1.3

TABLE A.1

Southwest Alluvium Data Summary, 1989-2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
0801	N	1/12/1999	no data	6.50	7.49	8010	470	858	347	14.3	1390	4450	222	20.3	6.05	3.3	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	16.2	< 0.1	< 0.05	< 0.001	< 0.1	0.0433	0.8	< 1	0.8	< 0.2	< 1	< 1
0801	N	4/13/1999	no data	6.40	7.65	7940	534	902	357	13	1410	4060	221	19.8	6.37	3.9	< 0.1	< 0.001	< 0.01	0.006	< 0.01	< 0.05	17	< 0.1	< 0.05	< 0.001	< 0.1	0.0389	< 0.2	2.5	2.5	< 0.2	< 1	< 1
0801	N	7/20/1999	no data	6.50	7.63	7950	545	932	414	15.5	1420	4240	220	19.7	5.51	3.5	< 0.1	< 0.001	< 0.01	< 0.006	0.02	< 0.05	12.6	< 0.1	< 0.05	< 0.001	< 0.1	0.0405	0.9	3.7	4.6	< 0.2	< 1	1
0801	N	10/5/1999	no data	6.37	7.53	7500	594	936	352	14.7	1450	4300	227	16.2	25.1	2.3	< 0.1	< 0.001	< 0.01	0.006	< 0.01	< 0.05	16.1	< 0.1	< 0.05	< 0.001	< 0.1	0.0527	1.1	< 1	1.1	< 0.2	< 1	1.4
0801	N	1/4/2000	no data	6.50	7.94	8450	539	1010	307	16.1	1400	4670	205	20.2	11.9	2.6	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	23.6	< 0.1	< 0.05	0.001	< 0.1	0.0408	0.7	< 1	0.7	< 0.2	< 1	1.3
0801	N	1/8/2001	6,852.90	6.67	7.70	7330	578	820	359	16.6	1570	3700	240	9.07	48.9	2.2	< 0.1	0.002	< 0.01	< 0.005	< 0.01	< 0.05	6.52	< 0.1	< 0.05	0.001	< 0.1	0.087	< 0.2	< 1	0	< 0.2	< 1	< 1
0801	N	2/6/2001	6,853.85	6.90	7.42	7200	642	882	397	15.8	1570	3970	226	9.46	29.9	1.6	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	7.28	< 0.1	< 0.05	< 0.001	< 0.1	0.071	0.5	< 1	0.5	< 0.2	< 1	< 1
0801	N	3/5/2001	6,854.30	6.92	7.19	6610	550	785	273	15.1	1580	3660	203	8.34	21.9	2.3	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	7.98	< 0.1	< 0.05	< 0.001	< 0.1	0.0582	< 0.2	< 1	0	< 0.2	< 1	< 1
0801	N	4/3/2001	6,854.80	6.59	7.37	6930	615	825	320	12.8	1570	3580	214	7.88	17.5	3.11	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	7.02	< 0.1	< 0.05	< 0.001	< 0.1	0.053	0.4	< 1	0.4	< 0.2	< 1	< 1
0801	N	5/7/2001	6,855.20	6.47	7.53	7090	541	723	282	12.6	1560	3120	229	7.71	13.3	1.9	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	8.7	< 0.1	< 0.05	< 0.001	< 0.1	0.049	0.4	< 1	0.4	< 0.2	< 1	< 1
0801	N	6/4/2001	6,855.20	6.47	7.33	6680	549	745	294	12.7	1560	3380	225	8.12	8.45	3.3	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	8.24	< 0.1	< 0.05	< 0.001	< 0.1	0.046	< 0.2	< 1	0	< 0.2	< 1	< 1
0801	N	7/9/2001	6,855.38	7.02	7.11	6900	585	800	312	12.7	1610	3320	237	7.07	6.25	3.4	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	8.34	< 0.1	< 0.05	< 0.001	< 0.1	0.0486	0.8	< 1	0.8	< 0.2	< 1	< 1
0801	N	8/6/2001	6,855.43	6.76	7.40	6890	550	760	310	13	1580	3300	240	7.5	4.4	3	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	7.7	< 0.1	< 0.05	< 0.001	< 0.1	0.048	0.4	< 1	0.4	< 0.2	< 1	< 1
0801	N	9/10/2001	6,855.80	6.38	7.00	6860	560	770	319	13.6	1600	3300	248	6.75	< 0.1	2.85	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	6.24	< 0.1	< 0.05	< 0.001	< 0.1	0.044	0.3	< 1	0.3	< 0.2	< 1	< 1
0801	N	10/1/2001	6,855.75	6.45	7.50	7060	530	750	330	14.1	1600	3200	253	7.2	2.9	2.4	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	6.87	< 0.1	< 0.05	< 0.001	< 0.1	0.0373	0.7	< 1	0.7	< 0.2	< 1	< 1
0801	N	11/5/2001	6,855.90	6.46	7.00	7070	583	805	318	14.3	1590	3670	272	7	3.3	2.82	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	7.36	< 0.1	< 0.05	< 0.001	< 0.1	0.0374	0.4	< 1	0.4	< 0.2	< 1	< 1
0801	N	12/4/2001	6,856.10	6.56	7.00	7090	531	734	293	12.3	1590	3240	229	7.4	3	2.03	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	6.57	< 0.1	< 0.05	< 0.001	< 0.1	0.0407	< 0.2	< 1	0	< 0.2	< 1	< 1
0801	N	1/8/2002	6,856.10	6.58	7.20	7100	620	817	261	13.9	1570	3840	274	6.8	2.34	2.9	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	6.61	< 0.1	< 0.05	< 0.001	< 0.1	0.0422	0.3	< 1	0.3	< 0.2	< 1	< 1
0801	N	2/4/2002	6,856.20	6.45	7.10	7120	603	790	290	13.6	1600	3640	264	6.8	2.08	3.1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	6.69	< 0.1	< 0.05	< 0.001	< 0.1	0.0336	0.7	< 1	0.7	< 0.2	< 1	< 1
0801	N	3/4/2002	6,856.15	6.41	7.20	7070	563	780	354	13.8	1590	3720	259	3.6	2.41	2.7	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	7.89	< 0.1	< 0.05	< 0.001	< 0.1	0.0525	< 0.2	< 1	0	< 0.2	< 1	< 1
0801	N	4/1/2002	6,856.32	6.36	7.33	7120	583	782	351	15.2	1600	3730	249	7.07	2.35	3.6	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	7.42	< 0.1	< 0.05	< 0.001	< 0.1	0.0423	< 0.2	< 1	0	< 0.2	< 1	< 1
0801	N	5/6/2002	6,856.41	6.35	7.38	7030	564	762	341	14.4	1570	3520	242	6.4	2.34	3	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	6.84	< 0.1	< 0.05	< 0.001	< 0.1	0.0472	< 0.2	< 1	0	< 0.2	< 1	< 1
0801	N	6/3/2002	6,856.43	6.33	7.43	7070	561	754	328	12.2	1570	3460	208	6.5	2.13	3.7	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	6.36	< 0.1	< 0.05	< 0.001	< 0.1	0.042	< 0.2	< 1	0	< 0.2	< 1	< 1
0801	N	7/8/2002	6,855.81	6.62	7.69	7050	552	778	257	13.8	1570	3570	194	6.3	2.04	3	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	5.85	< 0.1	< 0.05	< 0.001	< 0.1	0.0488	0.3	< 1	0.3	< 0.2	< 1	< 1
0801	N	10/8/2002	6,856.12	6.51	7.58	6960	515	699	328	12.7	1560	3260	206	6.4	1.99	3.2	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	5.66	< 0.1	< 0.05	< 0.001	< 0.1	0.0343	< 0.2	< 1	0	< 0.2	< 1	< 1
0801	N	1/6/2003	6,856.07	6.89	7.41	6860	561	785	380	14.1	1520	3600	193	6	1.5	3.1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	5.61	< 0.1	< 0.05	< 0.001	< 0.1	0.0404	< 0.2	< 1	0	< 0.2	< 1	1.4
0801	N	4/7/2003	6,856.27	6.37	7.31	6910	542	731	358	17.4	1520	3170	226	5.6	2.8	3.1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	5.08	< 0.1	< 0.05	< 0.001	< 0.1	0.0416	0.6	< 1	0.6	< 0.2	< 1	< 1.0
0801	N	7/7/2003	6,856.35	6.20	7.18	6880	517	694	316	15.4	1550	3350	200	5.3	1.2	3.7	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	5.25	< 0.1	< 0.05	< 0.001	< 0.1	0.0385	0.4	< 1	0.4	< 0.2	< 1	< 1.0
0801	N	10/6/2003	6,855.82	6.21	7.54	6730	585	764	364	12.7	1520	3640	219	5.2	1.2	2.9	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	4.65	< 0.1	< 0.05	< 0.001	< 0.1	0.0453	0.6	< 1	0.6	< 0.2	< 1	< 1.0
0801	N	1/5/2004	6,856.04	6.45	7.48	6640	554	721	320	12.3	1500	3460	224	5.2 D	1.09	3	0.2	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	5.16	< 0.1	< 0.05	< 0.001	< 0.1	0.0381 D	0.4	< 1.0	0.4	< 0.2	< 1.0	< 1.0
0801	N	4/5/2004	6,856.07	6.80	6.75	6680	554	719	356	13	2220	3360 D	206	4.5 D	0.75	3.1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	4.26	< 0.1	< 0.05	< 0.001	< 0.1	0.0422 D	1.3	< 1	1.3	< 0.2	< 1	< 1
0801	N	7/12/2004	6,855.86	6.17	6.87	6690	574	714	374	13.8	1450	3360 D	212	3.3 D	0.69	2.3	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	3.94	< 0.1	< 0.05	< 0.001	< 0.1	0.0400 D	0.4	< 1.0	0.4	< 0.2	< 1.0	< 1.0
0801	N	10/4/2004	6,855.47	6.27	6.97	6670	565 D	727 D	379	12.6	1470	3390 D	221	4.0 D	0.7	3.1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	4.15	< 0.1	< 0.05	< 0.001	< 0.1	0.0370 D	1.1	< 1.0	1.1	< 0.2	< 1.0	< 1.0
0801	N	1/3/2005	6,855.82	6.54	6.93	6700	574 D	729 D	353	12.3	1450	3300 D	198	3.9 D	0.6	2.6	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	3.82	< 0.1	< 0.05	< 0.001	< 0.1	0.0442	0.8	< 1.0	0.8	< 0.2	< 1.0	1.8
0801	N	4/4/2005	6,855.77	6.45	7.07	6300	564	697	344	11.4	1480	3310	194	3.5	0.3	2.9	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	3.93	< 0.1	< 0.05	< 0.001	< 0.1	0.041	0.7	< 1.0	0.7	< 0.2	< 1.0	< 1.0
0801	N	7/11/2005	6,855.42	6.37	7.28	6520	567 D	723 D	359	12.3	1350	3360 D	201	3.7 D	0.2	3.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	3.92	< 0.1	< 0.05	< 0.001	< 0.1	0.0416	0.4	< 1.0	0.4	< 0.2	< 1.0	< 1.0
0801	N	10/3/2005	6,855.15	6.49	7.05	6380	547 D	676 D	355	12.2	1450	3280 D	208	2.9 D	0.2	2.9	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	3.62	< 0.1	< 0.05	< 0.001	< 0.1	0.0419	< 0.2	2.4	2.4	< 0.2	< 1.0	1
0801	N	1/9/2006	6,855.08	6.58	7.57	6340	514	618 D	331	11.1	1490	2940 D	196	3.6 D	0.2	2.6	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	3.97	< 0.1	< 0.05	< 0.001	< 0.1	0.0382	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
0801	N	4/3/2006	6,855.22	6.36	7.05	6170	579 D	693 D	333	12.5	1430	3200 D	210	4.85	0.1	2.2	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	3.68	< 0.1	< 0.05	< 0.001	< 0.1	0.0374 D	0.4	1.5	1.9	< 0.2	< 1.0	< 1.0
0801	N	7/17/2006	6,854.87	6.31	6.68	6270	577 D	687 D	352	12.5	1420	3360 D	204	2.86	0.3	2.8	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	3.64	< 0.1	< 0.05	< 0.001	< 0.1	0.042	0.6	< 1.0	0.6	< 0.2	< 1.0	1.1
0801	N	10/2/2006	6,855.19	6.43	6.96	6180	583 D	692 D	343	12.4	1810	3270 D	192	3.15	1	2.17	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	3.65	< 0.1	< 0.05	< 0.001	< 0.1	0.0407	0.5	2.5	3	< 0.2	< 1	< 1
0801	N	1/8/2007	6,854.77	6.49	6.81	6420	557 D	681 D	307	12.8	1430	3220 D	191	2.7 D	1.4	2.33	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	3.69	<0.1	<0.05	<0.001	<0.1	0.0395	0.5	1.6	2.1	<0.2	<1	<1
0801	N	4/9/2007	6,854.82	6.52	6.70	5950	539 D	663 D	304	14	1430	3170 D	199	3.1	1	2.06	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	3.63	<0.1	<0.05	<0.001	<0.1	0.0404	<0.2	<1	0	<0.2	<1	1.2
0801	N	7/9/2007	6,854.52	6.33	6.75	6200	573 D	726 D	352	13.3	1510	3500 D	179	2.77	0.8	2.84	<0.1	0.01	<0.01	<0.005	<0.01	<0.05	3.43	<0.1	<0.05	<0.001	<0.1	0.0423	<0.2	<1	0	<0.2	<1	<1
0801	N	10/1/2007	6,854.29	6.46	6.65	6470	514 D	661 D	338 D	13.5	1490	3200 D	223 D	3.37	0.8	2.96	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	4.25	<0.1	<0.05	<0.001	<0.1	0.0431	0.5	<1	0.5	1.5	<1	1.3
0801	N	1/14/2008	6,854.17	6.49	6.65	6580	528 D	669 D	334 D	13	1440	3100 D	209 D	3.55	0.9	2.68	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	3.81	< 0.1	< 0.05	< 0.001	< 0.1	0.0366	< 0.2	< 1	0	< 0.2	< 1	< 1
0801	N	4/7/2008	6,854.47	6.40	6.75	6190	578 D	763 D	375 D	14.4 D	1380	3610 D	197	3.3 D	0.9	2.78	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	4.01	< 0.1	< 0.05	< 0.001	< 0.1	0.0395	0.5	1.2	1.7	0.2	-4.5 U	1.5
0801	N	7/7/2008	6,854.22	6.18	6.67 H	6300 H	530	693	314 D	11	1460	3610 D	206	3	1.1	3.49	< 0.1	< 0.003	< 0.01	< 0.005	< 0.01	< 0.05	4.81	< 0.1	< 0.05	< 0.001	< 0.1	0.0387	0.34	2.5	2.84	0.3	-0.3 U	1.2
0801	N	10/6/2008	6,853.82	6.30	6.75	6490	549	729	336 D	12	1430	3790 D	191	3.7	1.1	2.84	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	3.86	< 0.1	< 0.05	< 0.001	< 0.1	0.0382	0.52	0.14 U	0.66	0.4	-2 U	1.6
0801	N	1/12/2009	6,853.77	6.39	6.70	6760	537	730	351	11	1450	2970 D	183	1.19	1.5	2.82	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	2.64	<0.1	<0.05	<0.001	<0.1	0.0198	0.07 U	0.68 U	0.75	0.4 U	-2 U	1.4
0801	N	4/6/2009	6,853.57	6.36	6.51	6700	524 D	714 D	359 D	12	1490	3530 D	198	2.25	1.8	3.45	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	4.32	<0.1	<0.05	<0.001	<0.1	0.0347	0.43	0.60 U	1.03	0.07 U	-0.1 U	0.8
0801	N	7/6/2009	6,853.47	6.27	6.63	6550 H	567 D	738	343 D	13	1460	3420 D	208	3.91	1.8	2.49	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	5.12	<0.1	<0.05	<0.001	<0.1	0.0367	0.99	1.9	2.89	0.2 U	-0.5 U	1.5
0801	N	10/5/2009	6,852.97	6.47	7.10	6530	540 D	701	329 D	12	1510	3420 D	215	4.0 D	2.2	2.21	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	4.67	<0.1	<0.05	<0.001	<0.1	0.0393	0.91	1.2 U	2.11	0.002 U	1.4 U	0.6 U
0801	N	1/4/2010	6,852.82	6.54	6.84	6580 D	552 D	682	338 D	12	1540	3540 D	203	2.98	2.2	2.51	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	4.2	<0.1	<0.05	<0.001	<0.1	0.035	0.44	1.1 U	1.54	-0.03 U	0.3 U	1
0801	N	4/5/2010	6,852.92	6.42	6.75	6550 DH	585 D	709	368 D	12	1590	3510 D	191	3.64	2.8	2.17	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	3.98	<0.1	<0.05	<0.001	<0.1	0.0396	0.41	0.80 U	1.21	0.08 U	1.9 U	0.7
0801	N	7/12/2010	6,852.67	6.43	7.05	6420 D	578 D	690	344 D	12	1570	3390 D	200 D	3.85	2.9 D	2.56	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	4.41	<0.1	<0.05	<0.001	<0.1	0.0423	0.67	0.78 U	1.45	0.01 U	0.7 U	0.5 U
0801	N	10/4/2010	6,852.32	6.45	7.48	6510 D	540	638	344	12	1570	3410 D	197 D	3.54	5.0 D	2.65	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	4.17	<0.1	<0.05	<0.001	<0.1	0.0396	0.38	0.59 U	0.97	0.02 U	1.9	0.4 U
0801	N	1/3/2011	6,852.17	6.41	7.45	5940 D	572 D	676	348 D	12	1500	3290 D	207 D	1.93	5.3 D	2.14	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	3.98	<0.1	<0.05	<0.001	<0.1	0.0407	0.25	0.73 U	0.98	0.01 U	0.6 U	0.8 U
0801	N	4/5/2011	6,852.04	6.51	6.69	6370 D	566	645	371 D	13	1500	3290 D	206 D	3.36 D	7.9 D	2.76	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	4.05	<0.1	<0.05	<0.001	<0.1	0.0357	0.29	0.96 U	1.25	0.02 U	-0.2 U	0.4

TABLE A.1

Southwest Alluvium Data Summary, 1989-2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

[redacted]cation ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
0801	N	7/11/2011	6,851.87	6.43	7.23	6040 D	576	660	364	12	1490	3170 D	198 D	3.4 D	9.7 D	2.22	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	3.98	<0.1	<0.05	<0.001	<0.1	0.04	0.37	1.2	1.57	0.02 U	-0.8 U	1
0801	N	10/3/2011	6,851.52	6.51	7.19	6000 D	552	644	354	12	1400	3290 D	204 D	2.8 D	11.2 D	2.39	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	4.13	<0.1	<0.05	<0.001	<0.1	0.037	0.47	0.66 U	1.13	0.01 U	0.4 U	0.8
0801	N	1/2/2012	6,851.41	6.59	6.80 H	6040 D	567	610	331	13	1360	3150 D	200 D	3.2 D	11.9 D	2.68	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	3.62	<0.1	<0.05	<0.001	<0.1	0.0375	0.59	0.44 U	1.47	0.02 U	0.9 U	0.7
0801	N	4/2/2012	6,851.39	6.72	6.57 H	6220 D	576	622	332	13	1470	3180 D	200 D	3.2 D	14.5 D	2.76	<0.1	<0.01	<0.01	<0.005	<0.01	<0.05	3.76	<0.1	<0.05	<0.001	<0.1	0.0407	0.4	0.65 U	1.7	-0.04 U	-0.1 U	0.1 U
0801	N	7/9/2012	6,851.12	6.52	6.58 H	6390	584	708	362 D	13	1470	3090 D	193 D	3.3	18 D	1.89	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	4.21	<0.1	<0.05	<0.001	<0.1	0.037	0.55	0.59 U	1.73	-0.01 U	0.5 U	0.5
0801	N	10/8/2012	6,850.82	6.57	6.62 H	6120	592	652	352 D	14	1520	3270 D	211 D	3.8 D	20 D	1.81	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	5.01	<0.1	<0.05	<0.001	<0.1	0.0387	0.42	2.5	2.92	0.02 U	0.5 U	0.7
0801	N	1/7/2013	6,850.81	6.51	6.63 H	6100	594	732	387 D	13	1520	3360 D	203 D	3.23	24 D	1.88	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	5.09	<0.1	<0.05	<0.001	<0.1	0.0399	0.62	1.0 U	0.62	0.03 U	0.6 U	0.4 U
0801	N	4/1/2013	6,850.64	6.55	6.69 H	6350	576	767	378	14	1550	3420 D	213 D	4.15	27 D	2.02	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	5.46	<0.1	<0.05	<0.001	<0.1	0.0418	0.25	0.11 U	0.25	0.005 U	-0.3 U	0.6
0801	N	7/8/2013	6,850.39	6.41	6.70 H	7190	568	793	366	12	1570	3610 D	211 D	3.98	37 D	1.86	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	6.16	<0.1	<0.05	<0.001	<0.1	0.0447	0.36	0.69 U	0.36	0.04 U	0.2 U	1.1
0801	N	9/30/2013	6,850.40	6.51	6.63 H	7120 H	551	802	368	12	1600	3520 D	206 D	4.4	40 D	1.64	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	6.72	<0.1	<0.05	<0.001	<0.1	0.0491	0.6	0.18 U	0.6	0.06 U	-0.02 U	0.4 U
0801	N	1/6/2014	6,850.20	6.73	6.65	6780	552	798	370	13	1590	3670	210	3.97	38	2.12	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	6.58	<0.1	<0.05	<0.001	<0.1	0.0447	0.51	1.2 U	0.51	0.03	0.6 U	0.8
0801	N	3/31/2014	6,850.14	6.70	6.57 H	7090	568	817	385 D	13	1590	3700 D	220 D	4.13	41 D	1.92	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	6.82	<0.1	<0.05	<0.001	<0.1	0.0488	0.47	1.0 U	0.47	0.07 U	-0.9 U	0.6 U
0801	N	7/7/2014	6,849.95	6.60	6.64 H	7260	544	817	371 D	13	1610	3850 D	206 D	4.52	42 D	2.28	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	7	<0.1	<0.05	<0.001	<0.1	0.034	0.38	1.0 U	0.38	0.02 U	0.5 U	0.3 U
0801	N	10/6/2014	6,849.74	6.65	6.60 H	7300	545	853	371	12	1620	3900 D	213 D	5.7 D	47 D	2.17	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	6.6	<0.1	<0.05	<0.001	<0.1	0.0435	0.6	0.99 U	0.6	-0.03 U	0.6 U	0.5 U
0801	N	1/5/2015	6,850.00	6.76	6.69 H	7470	550	851	381	13	1580	3620 D	202 D	3.77	52 D	1.95	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	6.52	<0.1	<0.05	<0.001	<0.1	0.0416	0.59	1.1 U	0.59	-0.01 U	1.7	1.4 U
0801	N	4/6/2015	6,849.51	6.30	6.75 H	7170	543	822	364	12	1530	3860 D	237 D	2.55	48 D	1.85	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	5.02	<0.1	<0.05	<0.001	<0.1	0.0365	0.76	0.41 U	0.76	0.007 U	0.3 U	3.4
0801	N	7/6/2015	6,849.34	6.51	6.59 H	7330	485	784	362	13	1650	3810 D	219 D	4.33	47 D	1.73	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	2.5	<0.1	<0.05	<0.001	<0.1	0.0397	0.3	0.75 U	0.3	0.06 U	0.1 U	1.5 U
0801	N	10/5/2015	6,849.10	6.61	6.61 H	7180	547	808	361	12	1520	3860 D	236 D	4.5 D	48 D	1.57	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	6.52	<0.1	<0.05	<0.001	<0.1	0.0348	0.32	0.11 U	0.32	0.01 U	0.01 U	2.3
0801	N	1/4/2016	6,848.95	6.74	6.69 H	7080	557	808	358	12	1600	3750 D	226 D	4.5 D	50 D	1	<0.1	<0.001	<0.001	<0.005	<0.01	0.003	5.09	<0.1	<0.05	<0.001	<0.1	0.0408	0.22	0.46 U	0.22	0.05 U	-0.1 U	1.3
0801	N	4/4/2016	6,848.77	6.58	6.72 H	6900	557	782	368	13	1570	3590 D	221 D	4.2 D	49 D	1.58	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	5.55	<0.1	<0.05	<0.001	<0.1	0.0408	0.39	2	2.39	0.1	0.3 U	1 U
0801	N	7/11/2016	6,848.58	6.60	6.74 H	6670 D	563	767	366	12	1490	3390 D	220 D	2.9 D	54 D	1.53	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	3.97	<0.1	<0.05	<0.001	<0.1	0.0341	0.41	2.5	2.91	0.005 U	0.6 U	0.6 U
0801	N	10/3/2016	6,848.36	6.70	6.69 H	6970 H	485	734	341	12	1580	3560 D	210 D	6.3 D	53 D	1.2	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	3.54	<0.1	<0.05	<0.001	<0.1	0.0315	0.54	-4 U	0.54	0.006 U	0.1 U	5.9
0801	N	1/9/2017	6,848.22	6.68	6.67 H	6570 D	527	750	347	12	1580	3720 D	226 D	3.6 D	57 D	0.68	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	5.79	<0.1	<0.05	<0.001	<0.1	0.0359	0.32	0.63 U	0.32	0.05 U	-0.06 U	0.06 U
0801	N	4/3/2017	6,848.07	6.54	6.69 H	6590 D	576	719	362 D	13	1580	3730 D	227 D	3.9 D	56 D	0.64	<0.1	<0.001	<0.001	<0.005	<0.01	0.001	5.82	<0.1	<0.05	<0.001	<0.1	0.0346	0.41	2.2	2.61	0.07 U	-0.6 U	0.6 U
0801	N	7/10/2017	6,847.85	6.58	6.67 H	6520 D	583	769	372 D	12	1560	3210 D	204 D	3.9 D	50.5 D	0.53	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	6.73	<0.1	<0.05	<0.001	<0.1	0.0371	0.6	1.1 U	0.6	-0.02 U	0.8 U	-0.2 U
0801	N	10/2/2017	6,847.53	6.61	6.72 H	6520 D	570	782	368 D	12	1600	3250 D	200 D	4.4 D	58.5 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	6.27	<0.1	<0.05	<0.001	<0.1	0.0407	0.2	0.8 U	0	-0.008 U	1.1 U	0.2 U
[redacted]01	N	1/8/2018	6,847.37	6.75	6.69 H	6840 D	541	722	346 D	12	1460	3550 D	212 D	4.3 D	58.5 D	<0.50	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	6.58 D	0.001	0.015	<0.001	<0.01	0.04	0.3	-0.3 U	0.3	0.07 U	-0.2 U	0.4 U
[redacted]01	N	4/2/2018	6,847.33	6.64	6.65 H	6820 D	625 D	672	347 D	12	1490	3550 D	226 D	3.2 D	59 D	<0.50	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	6.31	0.001	0.014	<0.001	<0.01	0.0398	0.6	1.4	2	0.1 U	6.8	1.2
0801	N	7/9/2018	6,847.06	6.56	6.69 H	6730 D	538	683	329	11	1520	3340 D	213 D	4.0 D	61.0 D	<0.50	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	5.92	0.002	0.014	<0.001	<0.01	0.0392	0.4	1.5	1.9	0.1 U	0.9 U	0.5 U
0801	N	10/1/2018	6,846.73	6.69	6.64 H	6720 D	561	696	338 D	12	1520	3500 D	218 D	3.3 D	55 D	<0.50	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	6.12	0.001	0.015	<0.001	<0.01	0.0366	0.6	-0.3 U	0.6	0.09 U	0.4 U	0.4 U
0801	N	1/7/2019	6,846.51	6.59	6.71 H	6460 D	563	745	374 D	13	1490	3380 D	206 D	1.8 D	46.2 D	<0.50	<0.03	no data	<0.001	<0.001	<0.005	<0.001	3.93	0.001	0.013	no data	<0.01	0.0348	0.2	0.9 U	1.1	-0.02 U	0.6 U	1.5
0801	N	4/8/2019	6,846.41	6.46	6.64 H	6440 D	573	686	352	13	1510	3390 D	210 D	2.8 D	39.2 D	<0.50 J	<0.03	0.002	<0.001	<0.001	<0.005	<0.001	5.38	<0.001	0.016	0.002	0.04	0.0312	0.3	1.3 U	1.6	0.01 U	0.5 U	0.7
0801	N	7/15/2019	6,846.27	6.76	6.68 H	6390 D	545	653	327	12	1520	3230 D	207 D	2.5 D	36.9 D	<0.50 J	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	4.45 L	0.001	0.013	0.002	<0.01	0.0372	0.4	-0.1 U	0.3	0.02 U	0.3 U	0.2 U
0801	N	10/9/2019	6,845.88	6.75	6.76 H	6430 DH	546	679	353	13	1490	3330 D	213 D	3.6 D	37 D	<0.50 J	0.12	<0.001	<0.001	<0.001	<0.005	<0.001	3.1 D	0.001	0.012	0.002	<0.01	0.0373	0.4	0.5 U	0.9	0.02 U	0.1 U	1.3
0802	N	10/17/1989	6,874.80	6.50	6.89	6744	944	519	374	6.7	2288	2371	221	0.22	113	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.01	< 0.05	0.2	< 0.01	< 0.05	< 0.001	< 0.1	0.154	0.6	< 1	0.6	< 0.2	< 1	1.5
0802	N	1/11/1990	no data	6.50	6.98	6978	849	530	350	5.08	2547	2663	229	0.17	124	1.9	< 0.1	< 0.001	< 0.05	< 0.01	0.04	< 0.05	0.21	< 0.1	< 0.05	< 0.001	< 0.1	0.164	0.3	< 1	0.3	1.3	< 1	1.8
0802	N	4/5/1990	no data	6.50	6.80	6854	877	570	380	5.2	2416	2528	230	0.12	128	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.02	< 0.05	0.21	< 0.1	< 0.05	< 0.001	< 0.1	0.128	0.7	< 1	0.7	< 0.2	1.2	1.1
0802	N	7/9/1990	no data	6.60	7.02	6937	866	605	378	5.6	2347	2625	213	< 0.05	133	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.23	< 0.1	< 0.05	0.001	< 0.1	0.123	< 0.2	< 1	0	< 0.2	< 1	< 1
0802	N	10/3/1990	no data	6.60	7.18	6698	944	586	383	5.6	1940	2606	224	< 0.05	89.7	< 1	< 0.1	0.001	< 0.05	< 0.01	0.02	< 0.05	0.2	< 0.1	< 0.05	< 0.001	< 0.1	0.1812	0.4	1	1.4	< 0.2	1.4	< 1
0802	N	1/3/1991	no data	6.50	7.22	6727	898	649	397	8.6	2318	2691	230	0.08	152	< 1	< 0.1	< 0.001	< 0.01	0.01	0.01	< 0.05	0.23	< 0.1	0.05	0.001	< 0.1	0.0218	0.7	1.3	2	< 0.2	< 1	< 1
0802	N	4/11/1991	no data	6.30	7.65	6711	893	615	382	6.1	2171	2561	240	< 0.05	165	< 1	< 0.1	< 0.001	< 0.01	0.03	0.01	< 0.05	0.18	< 0.1	< 0.05	< 0.001	< 0.1	0.1568	< 0.2	< 1	0	< 0.2	2.1	< 1
0802	N	7/11/1991	no data	6.40	7.21	7065	829	624	335	4.6	1940	2857	218	< 0.08	127	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.01	< 0.05	0.24	< 0.1	< 0.05	0.001	< 0.1	0.1983	< 0.2	< 1	0	< 0.2	2.1	< 1
0802	N	10/23/1991	no data	6.40	7.41	6795	800	543	362	4.6	2250	2775	237	0.36	99	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.02	no data	0.28	< 0.1	< 0.05	< 0.001	< 0.1	0.22	< 0.2	2.1	2.1	< 0.2	< 1	< 1
0802	N	1/16/1992	no data	6.30	7.10	6541	765	657	363	4.4	1662	2916	235	0.57	117	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.02	< 0.05	0.35	< 0.1	< 0.05	< 0.001	< 0.1	0.144	0.5	< 1	0.5	< 0.2	< 1	< 1
0802	N	4/13/1992	no data	6.20	6.84	7383	852	592	393	5.5	2404	2730	234	0.09	81.3	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.44	< 0.1	< 0.05	0.004	< 0.1	0.045	0.2	< 1	0.2	< 0.2	2.7	< 1
0802	N	7/8/1992	no data	6.20	7.32	5929	841	608	445	6.2	1777	2615	235	0.16	100	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.4	< 0.1	< 0.05	0.001	< 0.1	0.14	1.2	4.4	5.6	< 0.2	< 1	1.5
0802	N	10/8/1992	no data	6.80	7.21	7274	809	648	456	8.2	2245	3057	228	< 0.05	136	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.4	< 0.1	< 0.05	0.002	< 0.1	0.124	0.8	< 1	0.8	< 0.2	< 1	< 1
0802	N	1/7/1993	no data	6.80	7.46	6306	782	660	397	6	2150	2980	236	0.14	105	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.01	< 0.05	0.44	< 0.1	< 0.05	0.006	< 0.1	0.127	< 0.2	< 1	0	< 0.2	< 1	< 1
0802	N	4/7/1993	no data	6.50	7.15	6486	732	644	421	4.1	2223	3023	237	0.5	93.9	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.57	< 0.1	< 0.05	0.001	< 0.1	0.249	< 0.2	< 1	0	< 0.2	< 1	< 1
0802	N	7/14/1993	no data	6.40	7.00	7413	861	720	393	4.6	2208	3183	241	0.32	78.3	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.53	< 0.1	< 0.05	0.003	< 0.1	0.154	0.5	< 1	0.5	< 0.2	< 1	< 1
0802	N	10/7/1993	no data	6.40	6.98	6416	659	700	354	4.2	1972	2935	218	0.39	110	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.52	< 0.1	< 0.05	0.004	< 0.1	0.143	0.7	4.1	4.8	< 0.2	1.6	< 1
0802	N	1/6/1994	no data	6.40	6.75	6614	749	641	389	4	2125	3228	224	1	80.3	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.55	< 0.1	< 0.05	< 0.001	< 0.1	0.148	0.5	1.6	2.1	< 0.2	< 1	3.9
0802	N	4/12/1994	no data	6.30	6.99	7568	731	706	367	4.7	2047	3596	184	1.24	96.2	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.72	< 0.1	< 0.05	0.001	< 0.1	0.176	< 0.2	< 1	0	< 0.2	< 1	< 1
0802	N	7/27/1994	no data	6.40	7.35	7680	866	715	355	5.3	2237	3484	217	1.03	106	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.57	< 0.1	< 0.05	0.003	< 0.1	0.165	0.8	< 1	0.8	< 0.2	< 1	< 1
0802	N	10/5/1994	no data	6.30	7.45	7578	790	826	389	5.8	2288	3277	225	1.47	97.3	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.57	< 0.1	< 0.05	< 0.001	< 0.1	0.153	0.8	< 1	0.8	< 0.2	< 1	< 1
0802	N	1/4/1995	no data	6.60	7.29	7845	853	756	376	6.5	2323	3436	240	1.66	86.1	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.78	< 0.1	< 0.05	< 0.001	< 0.1	0.142	0.4	2.2	2.6	< 0.2	< 1	3.9
0802	N	4/6/1995	no data	6.50	6.75	7761	786	714	380	5.2	2269	3551	268	1.82	93	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.76	< 0.1	< 0.05	< 0.001	< 0.1	0.159	< 0.2	< 1	0	< 0.2	2.6	< 1
0802	N	7/6/1995	no data	6.40	7.43	7216	750	735	375	5.8	2257	3310	236	1.83	84.6	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.69	< 0.1	< 0.05	0.002	< 0.1	0.1883	0.3	< 1	0.3	< 0.2	< 1	1.5
[redacted]02	N	10/4/1995	no data	6.50	7.56	7003	738	754	369	5.3	2208	3301	190	2.23	88.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.73	< 0.1	< 0.05	0.024	< 0.1	0.157	0.3	< 1	0.3	< 0.2	< 1	1.4

TABLE A.1

Southwest Alluvium Data Summary, 1989-2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
0802	N	1/3/1996	no data	6.40	7.92	7477	817	805	361	5.5	2166	3530	222	1.84	85.8	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.09	< 0.1	< 0.05	0.022	< 0.1	0.168	0.4	< 1	0.4	< 0.2	3.6	< 1
0802	N	4/2/1996	no data	6.40	7.37	7595	796	845	380	11.4	2250	3560	227	1.88	88.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.8	< 0.1	< 0.05	< 0.001	< 0.1	0.167	< 0.2	< 1	0	< 0.2	< 1	1.2
0802	N	7/17/1996	no data	6.30	6.96	7488	701	723	366	6	2196	3164	236	1.6	91.2	1.21	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.81	< 0.1	< 0.05	< 0.001	< 0.1	0.086	< 0.2	< 1	0	< 0.2	< 1	< 1
0802	N	10/8/1996	no data	6.70	7.25	7600	756	778	357	6.4	2200	3291	220	1.7	76.5	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.06	< 0.1	< 0.05	< 0.001	< 0.1	0.171	0.5	< 1	0.5	< 0.2	< 1	< 1
0802	N	1/28/1997	no data	6.50	7.84	7350	745	720	301	6	2142	3215	317	1.23	79.1	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.93	< 0.1	< 0.05	< 0.001	< 0.1	0.171	< 0.2	< 1	0	< 0.2	< 1	< 1
0802	N	4/8/1997	no data	6.40	7.44	7270	756	740	336	6.6	2090	3190	240	1.53	80.1	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.98	< 0.1	< 0.05	0.021	< 0.1	0.181	1.4	< 1	1.4	< 0.2	< 1	1.9
0802	N	7/8/1997	no data	6.70	7.38	7430	786	759	335	6.7	2140	2930	236	1.37	82	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.97	< 0.1	< 0.05	< 0.001	< 0.1	0.018	0.6	< 1	0.6	< 0.2	< 1	< 1
0802	N	10/8/1997	no data	6.50	7.45	7330	789	750	336	6.35	2160	3050	252	1.38	82.8	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.26	< 0.1	< 0.05	< 0.001	< 0.1	0.176	< 0.2	< 1	0	< 0.2	< 1	< 1
0802	N	1/20/1998	no data	6.20	7.72	7320	766	721	356	7.6	2120	3350	242	1.49	83.3	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.25	< 0.1	< 0.05	< 0.001	< 0.1	0.198	< 0.2	< 1	0	< 0.2	< 1	< 1
0802	N	4/7/1998	no data	6.60	7.30	7310	776	723	340	6.7	2120	3010	212	1.2	90.8	1.2	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.18	< 0.1	< 0.05	< 0.001	< 0.1	0.186	< 0.2	< 1	0	< 0.2	< 1	< 1
0802	N	7/7/1998	no data	6.80	7.42	7350	758	726	348	6.6	2180	2900	224	1.26	86.6	1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.19	< 0.1	< 0.05	< 0.001	< 0.1	0.208	0.6	< 1	0.6	< 0.2	< 1	< 1
0802	N	10/6/1998	no data	6.43	7.64	7340	796	757	361	7.2	2110	3230	210	1.13	85.4	1.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.2	< 0.1	< 0.05	0.001	< 0.1	0.207	< 0.2	< 1	0	< 0.2	< 1	< 1
0802	N	1/12/1999	no data	6.60	7.55	7190	734	686	298	7.4	2110	3260	207	1.28	88.1	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.29	< 0.1	< 0.05	< 0.001	< 0.1	0.211	< 0.2	< 1	0	< 0.2	< 1	< 1
0802	N	4/13/1999	no data	6.40	7.65	7320	783	732	323	6.8	2090	3060	205	1.23	86.2	1.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.48	< 0.1	< 0.05	< 0.001	< 0.1	0.19	< 0.2	< 1	0	< 0.2	< 1	< 1
0802	N	7/20/1999	no data	6.50	7.58	7350	760	743	370	9.8	2120	3160	207	1.18	76.2	1.4	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.13	< 0.1	< 0.05	< 0.001	< 0.1	0.196	0.5	< 1	0.5	< 0.2	< 1	1
0802	N	10/12/1999	no data	6.62	7.66	7360	703	695	311	6.4	2120	2920	194	1.09	76.9	1.4	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.37	< 0.1	< 0.05	< 0.001	< 0.1	0.203	< 0.2	< 1	0	< 0.2	< 1	< 1
0802	N	1/11/2000	no data	6.50	7.73	7350	732	734	298	9.5	2100	3120	195	1.06	119	1.6	0.12	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.83	< 0.1	0.05	0.001	< 0.1	0.18	< 0.2	< 1	0	< 0.2	< 1	< 1
0802	N	5/2/2000	no data	6.70	7.55	7170	651	643	290	9.1	2047	2920	174	1.24	81.2	1.5	0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.27	< 0.1	< 0.05	0.001	< 0.1	0.193	< 0.2	2.1	2.1	< 0.2	< 1	< 1
0802	N	7/12/2000	6,841.60	6.55	7.33	7030	699	700	297	12.1	2020	2870	174	0.91	42	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.52	< 0.1	< 0.05	< 0.001	< 0.1	0.098	< 0.2	< 1	0	< 0.2	< 1	< 1
0802	N	10/4/2000	6,842.00	6.37	7.01	7250	732	758	327	9	2050	3170	201	1.06	79.7	2	< 0.1	0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.97	< 0.1	< 0.05	< 0.001	< 0.1	0.168	< 0.2	< 1	0	< 0.2	< 1	< 1
0802	N	1/8/2001	6,857.50	6.43	7.69	7360	751	758	300	8.2	2180	3190	203	1.2	89.3	2.2	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	2.73	< 0.1	< 0.05	0.004	< 0.1	0.193	< 0.2	3.6	3.6	< 0.2	< 1	< 1
0802	N	2/5/2001	6,860.50	6.49	7.10	6910	739	834	348	8.2	2050	3160	200	1.02	93.8	2.6	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	3.34	< 0.1	< 0.05	0.001	< 0.1	0.159	0.4	< 1	0.4	< 0.2	< 1	< 1
0802	N	3/5/2001	6,861.00	6.64	7.17	6120	737	661	370	8	2000	2850	158	0.12	103	1.5	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	0.96	< 0.1	< 0.05	0.001	< 0.1	0.165	< 0.2	2.9	2.9	< 0.2	< 1	< 1
0802	N	4/9/2001	6,861.60	6.86	7.24	6400	847	671	263	6.6	2050	2840	180	0.06	111	< 1	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	0.64	< 0.1	< 0.05	< 0.001	< 0.1	0.17	< 0.2	< 1	0	< 0.2	< 1	< 1
0802	N	5/7/2001	6,861.65	6.42	7.23	6660	737	608	257	6	2020	2420	193	0.08	102	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.6	< 0.1	< 0.05	0.001	< 0.1	0.181	< 0.2	< 1	0	< 0.2	< 1	< 1
0802	N	6/4/2001	6,861.95	6.46	7.16	6200	729	591	231	6.3	1960	2520	190	0.1	101	1.3	< 0.1	0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.62	< 0.1	< 0.05	0.011	< 0.1	0.214	< 0.2	< 1	0	< 0.2	< 1	< 1
0802	N	7/9/2001	6,862.10	7.07	7.06	6580	794	651	274	5.4	2060	2520	216	0.07	114	1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.6	< 0.1	< 0.05	0.001	< 0.1	0.221	< 0.2	< 1	0	< 0.2	< 1	< 1
0802	N	8/6/2001	6,862.08	6.43	7.20	6630	740	620	260	8	2050	2500	240	< 0.05	97.5	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.65	< 0.1	< 0.05	< 0.001	< 0.1	0.23	< 0.2	< 1	0	< 0.2	< 1	< 1
0802	N	9/10/2001	6,862.30	6.37	6.90	6400	770	600	284	5.6	2100	2400	216	< 0.05	100	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.68	< 0.1	< 0.05	< 0.001	< 0.1	0.25	0.3	2.7	3	< 0.2	< 1	< 1
0802	N	10/1/2001	6,862.35	6.44	7.40	6620	730	590	290	6.4	2080	2400	225	0.06	97.5	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.57	< 0.1	< 0.05	< 0.001	< 0.1	0.244	0.6	1.2	1.8	< 0.2	< 1	< 1
0802	N	11/5/2001	6,862.55	6.44	7.50	6660	786	618	304	6.3	2050	2640	227	< 0.05	114	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.62	< 0.1	< 0.05	< 0.001	< 0.1	0.219	0.3	< 1	0.3	< 0.2	< 1	< 1
0802	N	12/3/2001	6,862.65	6.56	7.50	6710	750	587	256	5.9	2060	2450	214	0.09	121	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.55	< 0.1	< 0.05	< 0.001	< 0.1	0.222	< 0.2	1.6	1.6	< 0.2	< 1	< 1
0802	N	1/7/2002	6,862.70	6.56	7.10	6750	874	646	226	8.2	2030	2850	232	0.05	98	1.2	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.58	< 0.1	< 0.05	< 0.001	< 0.1	0.225	0.4	< 1	0.4	< 0.2	< 1	< 1
0802	N	2/4/2002	6,862.80	6.50	7.20	6820	849	626	284	7	2070	2750	239	0.13	100	1.1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.63	< 0.1	< 0.05	< 0.001	< 0.1	0.222	< 0.2	< 1	0	< 0.2	< 1	< 1
0802	N	3/4/2002	6,862.75	6.48	7.10	6800	806	633	323	6	2030	2880	217	0.08	108	1.3	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.71	< 0.1	< 0.05	< 0.001	< 0.1	0.249	< 0.2	1.7	1.7	< 0.2	< 1	< 1
0802	N	4/1/2002	6,862.98	6.38	7.08	6900	840	648	326	7.7	2080	2980	212	0.06	98.1	1.6	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.7	< 0.1	< 0.05	< 0.001	< 0.1	0.223	< 0.2	< 1	0	< 0.2	< 1	< 1
0802	N	5/6/2002	6,862.02	6.36	7.24	7050	815	643	302	7.8	2090	2790	215	0.05	107	1.9	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.7	< 0.1	< 0.05	< 0.001	< 0.1	0.227	< 0.2	< 1	0	< 0.2	< 1	< 1
0802	N	6/3/2002	6,863.05	6.34	7.94	7430	859	705	299	6.6	2160	3090	196	0.08	103	3	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.53	< 0.1	< 0.05	< 0.001	< 0.1	0.199	< 0.2	< 1	0	< 0.2	< 1	< 1
0802	N	7/8/2002	6,862.81	6.41	7.84	7470	830	720	265	7.7	2190	3150	227	0.2	99.1	2.6	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.55	< 0.1	< 0.05	< 0.001	< 0.1	0.248	0.5	< 1	0.5	< 0.2	< 1	< 1
0802	N	10/7/2002	6,862.55	6.33	7.99	5680	774	710	317	6.2	2140	3060	187	0.08	95.2	3.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.65	< 0.1	< 0.05	< 0.001	< 0.1	0.205	< 0.2	< 1	0	< 0.2	< 1	< 1
0802	N	1/6/2003	6,861.34	6.64	7.52	7840	843	873	393	12.5	2310	3620	228	0.16	88	4.1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.64	< 0.1	< 0.05	< 0.001	< 0.1	0.218	< 0.2	< 1	0	< 0.2	< 1	< 1.0
0802	N	4/7/2003	6,861.54	6.43	7.34	7890	759	810	335	9.2	2300	3050	210	0.14	103	5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.63	< 0.1	< 0.05	< 0.001	< 0.1	0.24	0.4	< 1	0.4	< 0.2	< 1	< 1.0
0802	N	7/7/2003	6,861.49	6.27	7.90	8150	712	792	327	9.4	2300	3260	195	0.11	97	6.6	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.7	< 0.1	< 0.05	< 0.001	< 0.1	0.223	< 0.2	< 1	0	< 0.2	< 1	< 1.0
0802	N	10/6/2003	6,861.20	6.30	7.45	8140	765	927	376	7.1	2440	3710	211	0.24	88	6.2	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.77	< 0.1	< 0.05	< 0.001	< 0.1	0.254	0.4	< 1	0.4	< 0.2	< 1	< 1.0
0802	N	1/5/2004	6,861.21	6.45	7.92	8160	726	925	326	8.7	2440	3670	257	0.12	95.1 D	7.2	0.2	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.79	< 0.1	< 0.05	< 0.001	< 0.1	0.209 D	< 0.2	2.4	2.4	< 0.2	< 1.0	< 1.0
0802	N	4/5/2004	6,861.39	6.65	6.78	8310	693	931	368	7.8	2400	3580 D	209	0.09	96.2 D	7.4	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.65	< 0.1	< 0.05	0.002	< 0.1	0.207 D	< 0.2	< 1	0	< 0.2	< 1	< 1
0802	N	7/12/2004	6,861.15	6.28	6.90	8390	695	910	403	8.2	2370	3510 D	214	0.13	93.2 D	6.6	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.83	< 0.1	< 0.05	< 0.001	< 0.1	0.221 D	< 0.2	2.2	2.2	< 0.2	< 1.0	< 1.0
0802	N	10/4/2004	6,860.76	6.33	7.04	8200	666 D	955 D	397	6.8	2350	3580 D	215	< 0.05	83 D	8.4	< 0.1	< 0.001	< 0.01	0.006	< 0.01	< 0.05	0.8	< 0.1	< 0.05	0.001	< 0.1	0.194 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
0802	N	1/3/2005	6,860.89	6.57	6.93	8490	687 D	998 D	374	7.4	2370	3620 D	202	0.12	100 D	7.9	< 0.1	< 0.001	< 0.01	0.012	< 0.01	< 0.05	0.74	< 0.1	< 0.05	< 0.001	< 0.1	0.194 D	0.8	< 1.0	0.8	< 0.2	< 1.0	2.6
0802	N	4/4/2005	6,861.00	6.52	7.11	8100	669	957	365	6.1	2370	3710	190	< 0.05	83	9.6	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.72	< 0.1	< 0.05	< 0.001	< 0.1	0.18	0.7	< 1.0	0.7	< 0.2	< 1.0	< 1.0
0802	N	7/11/2005	6,860.64	6.43	7.25	8210	676 D	1010 D	363	6.6	2370	3780 D	225	0.09	93 D	12.3	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.79	< 0.1	< 0.05	< 0.001	< 0.1	0.187 D	0.4	< 1.0	0.4	< 0.2	< 1.0	< 1.0
0802	N	10/3/2005	6,860.41	6.44	7.17	8290	672 D	1050 D	366	6.8	2280	3620 D	199	0.09	90 D	10.6	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.82	< 0.1	< 0.05	< 0.001	< 0.1	0.181 D	< 0.2	< 1.0	0	< 0.2	< 1.0	1.2
0802	N	1/9/2006	6,860.26	6.56	7.29	8250	620 D	954 D	310	7.1	2270	3560 D	179	< 0.05	102 D	10.9	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.84	< 0.1	< 0.05	< 0.001	< 0.1	0.165	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
0802	N	4/3/2006	6,860.24	6.40	7.06	8210	681 D	1030 D	320	6.8	2290	3700 D	192	0.16	99 D	9.8	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.8	< 0.1	< 0.05	0.002	< 0.1	0.152 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
0802	N	7/17/2006	6,860.04	6.35	6.95	8210	648 D	1080 D	388	7.8	2250	4330 D	215	0.06	100 D	11.6	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.84	< 0.1	< 0.05	< 0.001	< 0.1	0.167	0.3	< 1.0	0.3	< 0.2	< 1.0	< 1.0
0802	N	10/2/2006	6,859.94	6.44	6.72	8050	657 D	988 D	354	7.4	2320	3750 D	160	0.13	108 D	9.6	0.2	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.82	< 0.1	< 0.05	< 0.001	< 0.1	0.146 D	0.4	< 1	0.4	< 0.2	< 1	< 1
0802	N	1/8/2007	6,859.87	6.55	6.72	8250	621 D	936 D	327	8.1	2150	3610 D	189	1.68	102 D	11.2	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.81	<0.1	<0.05	<0.001	<0.1	0.146	0.3	<1	0.3	<0.2	<1	<1
0802	N	4/9/2007	6,860.04	6.58	6.75	7690	624 D	946 D	326	9.2	2180	3610 D	197	<0.05	103 D	15.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.87	<0.1	<0.05	<0.001	<0.1	0.148 D	<0.2	<1	0	<0.2	<1	<1
0802	N	7/9/2007	6,859.74	6.39	6.79	8050	651 D	1010 D	375	7	2280	3900 D	169	0.06	106 D	11.9	<0.1	0.008	<0.01	<0.005	<0.01	<0.05	0.79	<0.1	<0.05	<0.001	<0.1	0.153	<0.2	<1	0	<0.2	<1	<1

TABLE A.1

Southwest Alluvium Data Summary, 1989-2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
0802	N	10/1/2007	6,859.48	6.49	6.57	8080	593 D	923 D	348 D	7	2260	3490 D	209 D	<0.05	101 D	13.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.91	<0.1	<0.05	<0.001	<0.1	0.152	<0.2	<1	0	<0.2	<1	1.1
0802	N	1/14/2008	6,859.39	6.47	6.60	8170	622 D	961 D	344 D	7.6	2160	3530 D	219 D	< 0.05	97 D	14	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.8	< 0.1	< 0.05	< 0.001	< 0.1	0.128 D	< 0.2	< 1	0	< 0.2	< 1	< 1
0802	N	4/7/2008	6,859.69	6.41	6.77	7710	638 D	1010 D	386 D	8.1 D	2040	3980 D	192	< 0.1	158 D	13.7	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.9	< 0.1	< 0.05	< 0.001	< 0.1	0.143	0.1 U	0.3 U	0.4	-1.8 U	0 U	1 U
0802	N	7/7/2008	6,859.34	6.25	6.72 H	8000 H	640	986	336 D	6	2150	3800 D	195	< 0.05	105 D	15.2	< 0.1	< 0.003	< 0.01	< 0.005	< 0.01	< 0.05	0.9	< 0.1	< 0.05	< 0.001	< 0.1	0.132	-0.02 U	1.2	1.18	1	6.6 U	1.7
0802	N	10/6/2008	6,858.94	6.32	6.76	8140	619	950	342 D	6	2100	3980 D	181	0.2	148 D	13.8	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.71	< 0.1	< 0.05	< 0.001	< 0.1	0.132	0.16 U	0.44 U	0.6	0 U	-0.5 U	1.9
0802	N	1/12/2009	6,858.89	6.29	6.66	8300	619	974	365	6	2120	3290 D	183	<0.05	151 D	16.7	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.05	<0.1	<0.05	<0.001	<0.1	0.129	0.14 U	1.2 U	1.34	-0.1 U	-2 U	1.3
0802	N	4/6/2009	6,858.79	6.40	6.53	7830	581 D	951 D	371 D	6	2170	3900 D	191	<0.05	104 D	16.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.04	<0.1	<0.05	0.001	<0.1	0.127	0.34	0.71 U	1.05	0.5 U	-1 U	0.2 U
0802	N	7/6/2009	6,858.69	6.30	6.60	8100 H	654 D	975	359 D	6	2110	3840 D	208	<0.05	98 D	15.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.19	<0.1	<0.05	<0.001	<0.1	0.136	0.31	0.74 U	1.05	0.07 U	-2 U	1.1
0802	N	10/5/2009	6,858.24	6.51	7.13	7180	593 D	941	345 D	6	2160	3700 D	208	0.07	105 D	17.2	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.01	<0.1	<0.05	<0.001	<0.1	0.143	0.67	0.78 U	1.45	0.0004 U	0.2 U	0.6 U
0802	N	1/4/2010	6,857.99	6.46	6.75	8290 D	617 D	939	352 D	6	2200	4260 D	194	<0.05	110 D	15.7	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.05	<0.1	<0.05	<0.001	<0.1	0.123	0.11 U	1.3 U	1.41	0.09 U	0.1 U	0.5 U
0802	N	4/5/2010	6,858.09	6.45	6.59	8100 DH	679	1070	426 D	7	2280	3920 D	191	<0.05	106 D	16.8	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.05	<0.1	<0.05	<0.001	<0.1	0.145	0.16	1.3	1.46	0.04 U	3.6	0.1 U
0802	N	7/12/2010	6,857.84	6.37	6.88	8090 D	654 D	978	366 D	6	2210	3720 D	183 D	<0.05	103 D	17.8	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.19	<0.1	<0.05	<0.001	<0.1	0.15	0.51	0.32 U	0.83	0.07 U	0.2 U	0.3 U
0802	N	10/4/2010	6,857.54	6.46	7.31	8080	604	926	366	6	2200	3780 D	174 D	<0.05	97 D	18	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.27	<0.1	<0.05	<0.001	<0.1	0.138	0.18	0.89 U	1.07	0.06 U	0.8 U	0.2 U
0802	N	1/3/2011	6,857.44	6.39	7.03	7550 D	643 D	956	360 D	6	2080	3710 D	193 D	<0.05	92 D	15.9	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.15	<0.1	<0.05	<0.001	<0.1	0.136	0.07 U	1.5	1.57	-0.02 U	0.7 U	0.6 U
0802	N	4/5/2011	6,857.32	6.53	6.69	7840 D	616	911	385 D	6	2040	3690 D	189 D	0.39 DH	108 D	19	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.18	<0.1	<0.05	<0.001	<0.1	0.122	0.03 U	0.79 U	0.82	0.07 U	0.4 U	0.2 U
0802	N	7/11/2011	6,857.14	6.38	6.97	7780 D	632	926	378 D	6	2020	3560 D	184 D	<0.1	113 D	15.9	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.2	<0.1	<0.05	<0.001	<0.1	0.132	0.06 U	1.6	1.66	0.07 U	-0.04 U	0.9 U
0802	N	10/3/2011	6,856.82	6.49	7.52	7470 D	618	892	362 D	6	1900	3560 D	185 D	<0.1	107 D	17.2	0.2	0.002	<0.01	<0.005	<0.01	<0.05	1.18	<0.1	<0.05	<0.001	<0.1	0.119	0.14 U	0.50 U	0.64	-0.007 U	-0.2 U	0.4 U
0802	N	1/2/2012	6,856.69	6.58	6.75 H	7500 D	634	907	366	7	1840	3410 D	185 D	<0.05	114 D	18.2	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.2	<0.1	<0.05	<0.001	<0.1	0.123	0.33	0.48 U	1.29	-0.004 U	0.0 U	0.6
0802	N	4/2/2012	6,856.74	6.69	6.56 H	7540 D	636	858	339	6	1990	3490 D	202 D	<0.05	116 D	16.8	<0.1	<0.01	<0.01	<0.005	<0.01	<0.05	1.17	<0.1	<0.05	<0.001	<0.1	0.137	0.15	0.43 U	1.01	0.03 U	-0.4 U	-0.2 U
0802	N	7/9/2012	6,856.43	6.49	6.59 H	7800	609	930	347	5	1970	3260 D	175 D	0.27	113 D	13.4	<0.1	<0.001	<0.001	<0.005	<0.01	0.002	1.22	<0.1	<0.05	<0.001	<0.1	0.119	0.35	-0.02 U	0.35	0.0007 U	-0.06 U	0.3
0802	N	10/8/2012	6,856.14	6.55	6.58 H	7130	642	849	350 D	6	2010	3420 D	193 D	<0.05	110 D	12.6	<0.1	<0.001	<0.001	<0.005	<0.01	0.001	1.24	<0.1	<0.05	<0.001	<0.1	0.121	0.19	1.2 U	0.19	-0.02 U	0.008 U	0.8
0802	N	1/7/2013	6,856.12	6.42	6.57 H	6870	629	889	365 D	6	1980	3350 D	177 D	<0.05	112 D	12.6	<0.1	<0.001	<0.001	<0.005	<0.01	0.001	1.11	<0.1	<0.05	<0.001	<0.1	0.125	0.48	1.2	1.68	0.02 U	0.2 U	0.4 U
0802	N	4/1/2013	6,855.95	6.56	6.61 H	6920	620	865	349	6	2020	3190 D	185 D	<0.05	115 D	13.8	<0.1	<0.001	<0.001	<0.005	<0.01	0.001	1.23	<0.1	<0.05	<0.001	<0.1	0.132	0.17	0.61 U	0.17	0.07 U	0.2 U	0.8
0802	N	7/8/2013	6,855.72	6.47	6.68 H	7170	594	808	322	5	2000	3120 D	169 D	<0.05	105 D	11.1	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.27	<0.1	<0.05	<0.001	<0.1	0.135	0.09 U	0.88 U	0	0.01 U	0.1 U	0.6
0802	N	9/30/2013	6,855.69	6.47	6.58 H	7050 H	604	807	329	5	2050	3070 D	177 D	<0.05	110 D	10.6	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.21	<0.1	<0.05	<0.001	<0.1	0.14	0.28	0.25 U	0.28	0.03 U	0.3 U	0.2 U
0802	N	1/6/2014	6,855.53	6.70	6.58	6540	600	769	322	5	2040	3010	180	<0.05	101	10.4	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.25	<0.1	<0.05	<0.001	<0.1	0.129	0.47	1.1 U	0.47	-0.02 U	0.3 U	0.4 U
0802	N	3/31/2014	6,855.47	6.67	6.52 H	6700	584	752	338 D	5	2040	2990 D	185 D	<0.05	102 D	10.2	<0.1	<0.001	<0.001	<0.005	<0.01	0.001	1.24	<0.1	<0.05	<0.001	<0.1	0.134	0.38	2	2.38	-0.02 U	-0.6 U	1.2
0802	N	7/7/2014	6,855.29	6.58	6.63 H	6770	630	755	320 D	5	2080	3100 D	184 D	<0.05	96 D	11.6	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.19	<0.1	<0.05	<0.001	<0.1	0.104	0.11 U	0.72 U	0	0.01 U	0.4 U	-0.05 U
0802	N	10/6/2014	6,855.09	6.59	6.58 H	6850	626	777	334	5	2070	3050 D	184 D	<0.05	110 D	7.96	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.23	<0.1	<0.05	<0.001	<0.1	0.135	0.31	0.33 U	0.31	0.04 U	0.3 U	0.1 U
0802	N	1/5/2015	6,855.00	6.73	6.69 H	7000	618	767	332	5	2010	2910 D	171 D	0.1	96 D	8.88	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.16	<0.1	<0.05	<0.001	<0.1	0.131	0.4	1.2	1.6	0.05 U	0.01 U	0.4 U
0802	N	4/6/2015	6,854.87	6.56	6.6 H	6870	642	758	324	5	2130	3050 D	203 D	<0.05	84 D	9.96	<0.1	<0.001	<0.001	<0.005	<0.01	0.001	1.19	<0.1	<0.05	<0.001	<0.1	0.129	0.46	0.69 U	0.46	0.04 U	-0.3 U	3.5
0802	N	7/6/2015	6,854.67	6.41	6.53 H	6980	614	764	335	6	2180	3160 D	188 D	<0.05	102 D	7.84	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.18	<0.1	<0.05	<0.001	<0.1	0.131	0.27	1.6	1.87	0.04 U	0.3 U	1.6
0802	N	10/5/2015	6,854.45	6.58	6.57 H	6840	621	738	316	5	2000	3140 D	222 D	<0.05	81 D	7.48	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.24	<0.1	<0.05	<0.001	<0.1	0.112	0.49	1.3	1.79	-0.02 U	-0.1 U	2.6
0802	N	1/4/2016	6,854.31	6.67	6.53 H	6740	644	751	327	5	2180	3090 D	191 D	<0.05	83 D	6.4	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.14	<0.1	<0.05	<0.001	<0.1	0.131	0.45	-0.2 U	0.45	0.02 U	0.1 U	1.7
0802	N	4/4/2016	6,854.12	6.49	6.68 H	6880	640	747	340	5	2080	3050 D	185 D	<0.05	82 D	5.68	<0.1	<0.001	<0.001	<0.005	<0.01	0.001	1.22	<0.1	<0.05	<0.001	<0.1	0.134	0.3	2.3	2.6	0.008 U	0.09 U	1.2 U
0802	N	7/11/2016	6,853.99	6.53	6.56 H	6860 D	647	759	330	5	2130	2930 DH	202 D	<0.05	86 D	5.2	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.1	<0.1	<0.05	<0.001	<0.1	0.126	0.23	3.5	3.73	0.04 U	0.3 U	0.3 U
0802	N	10/3/2016	6,853.78	6.63	6.57 H	6990 H	641	761	337	5	1780	3470 D	234 D	<0.05	76 DH	3.9	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.15	<0.1	<0.05	<0.001	<0.1	0.118	0.38	0.35 U	0.38	-0.005 U	0.8 U	4.7
0802	N	1/9/2017	6,853.60	6.60	6.58 H	6530 D	648	778	339	5	2100	3110 D	188 D	<0.05	86 D	3.4	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.16	<0.1	<0.05	<0.001	<0.1	0.135	0.28	0.50 U	0.28	0.05 U	0.3 U	0.7 U
0802	N	4/3/2017	6,853.50	6.43	6.60 H	6470 D	673	737	336 D	6	2120	3220 D	198 D	<0.05	79 D	3.4	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.25	<0.1	<0.05	<0.001	<0.1	0.135	0.31	2.6	2.91	0.07 U	-0.4 U	1.3 U
0802	N	7/10/2017	6,853.24	6.48	6.60 H	6500 D	664	754	330 D	5	2080	2900 D	188 D	<0.05	75.5 D	2.4	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.18	<0.1	<0.05	0.001	<0.1	0.122	0.3	1.1 U	0.3	0.0007 U	0.3 U	0.4 U
0802	N	10/2/2017	6,852.99	6.52	6.62 H	6450 DH	638	740	332 D	6	2140	2880 D	173 D	<0.05	73.5 D	2.1	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.31	<0.1	<0.05	<0.001	<0.1	0.149	0.2	2.8	3	0.07 U	0.6 U	0.4 U
0802	N	1/8/2018	6,852.78	6.64	6.57 H	6780 D	639	714	330 D	5	1950	3190 D	184 D	0.6 D	73.8 D	2.2	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	1.26	<0.001	<0.005	<0.001	<0.01	0.126	0.2	0.3 U	0.2	0.02 U	-0.2 U	0.2 U
0802	N	4/2/2018	6,852.77	6.55	6.57 H	6880 D	686	770	331 D	6	1990	3240 D	201 D	<0.05	74 D	1.8	<0.03	<0.001	<0.001	<0.001	<0.005	0.004	1.27	0.002	0.012	<0.001	<0.01	0.141	0.4	1.4	1.8	-0.03 U	0 U	0.1 U
0802	N	7/9/2018	6,852.48	6.50	6.58 H	6710 D	616	686	313 D	5 D	2010	2970 D	186 D	<0.05	83.5 D	1.6	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	1.31	<0.001	0.007	<0.001	<0.01	0.139	0.5	2.7	3.2	-0.002 U	-0.01 U	1.2
0802	N	10/1/2018	6,852.15	6.56	6.56 H	6870 D	652	700	320 D	5	2010	3170 D	192 D	<0.05	75 D	1.6	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	1.32	<0.001	0.007	<0.001	<0.01	0.133	0.4	2.2	2.6	0.009 U	0.04 U	1.2
0802	N	1/7/2019	6,853.23	6.46	6.57 H	6590 D	648	757	348 D	6	2000	3120 D	184 D	<0.05	68.5 D	1.4	<0.03	no data	<0.001	<0.001	<0.005	<0.001	1.04	<0.001	0.006	no data	<0.01	0.126	0.2	0.4 U	0.6	0.06 U	-0.1 U	0.8
0802	N	4/8/2019	6,853.13	6.49	6.56 H	6650 D	678	643	350	6	2030	3180 D	189 D	<0.05	67.8 D	1.4	<0.03	0.003	<0.001	<0.001	<0.005	<0.001	1.47	<0.001	0.011	<0.001	0.01	0.13	0.3	2.3	2.6	0.02 U	0.4 U	0.8
0802	N	7/15/2019	6,852.96	6.54	6.6 H	6680 D	618	691	309	5	2040	3160 D	183 D	<0.05	74.5 D	1.2	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	1.37 D	<0.001	0.006	<0.001	<0.01	0.134 D	0.3	1.2 U	1.5	0.06 U	-0.2 U	0.1
0802	N	10/9/2019	6,852.62	6.69	6.6 H	6670 DH	680	728	337	6	2010	3110 D	188 D	<0.2 D	70.5 D	1.3	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	1.32 D	<0.001	0.007	<0.001	<0.01	0.136	0.2	0.3 U	0.5	0.07 U	0.2 U	1.3
0803	N	10/17/1989	6,880.40	6.70	6.91	4852	722	337	208	12.2	1379	2258	108	1.75	34	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	1.8	< 0.01	< 0.05	< 0.001	< 0.1	0.206	< 0.2	< 1	0	< 0.2	< 1	1
0803	N	1/11/1990	no data	6.60	7.16	5212	769	371	241	9.75	1647	2387	133	1.29	36	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	1.5	< 0.1	< 0.05	< 0.001	< 0.1	0.116	< 0.2	1.9	1.9	1.3	< 1	1.6
0803	N	4/5/1990	no data	6.70	7.02	5394	822	410	245	9.4	1696	2321	138	1.35	42	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	1	< 0.1	< 0.05	< 0.001	< 0.1	0.09	0.5	< 1	0.5	< 0.2	< 1	0.9
0803	N	7/9/1990	no data	6.60	7.18	5416	891	417	233	9.8	1625	2382	127	0.92	42.2	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.98	< 0.1	< 0.05	< 0.001	< 0.1	0.135	< 0.2	< 1	0	< 0.2	< 1	< 1
0803	N	10/3/1990	no data	6.50	7.29	5618	861	336	245	12	1659	2299	151	0.36	40	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.01	< 0.05	0.9	< 0.1	< 0.05	< 0.001	< 0.1	0.1711	< 0.2	< 1	0	< 0.2	< 1	< 1
0803	N	1/3/1991	no data	6.60	7.25	5305	779	384	256	31.8	1598	2439	144	1.41	57.5	< 1	< 0.1	< 0.001	< 0.01	0.01	0.01	< 0.05	1	< 0.1	< 0.05	< 0.001	< 0.1	0.1292	0.9	< 1	0.9	< 0.2	< 1	< 1
0803	N	4/11/1991	no data	6.50	7.65	5244	820	416	263	11.3	1702	2376	158	0.85	63	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.02	< 0.05	0.82	< 0.1	< 0.05	< 0.001	< 0.1	0.0853	0.6	< 1	0.6	< 0.2	< 1	< 1
0803	N	7/11/1991	no data	6.50	7.27	5616	745	349	219	9.1	1690	2547	195	0.89	71.3	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.58	< 0.1	< 0.05	0.007	< 0.1	0.1322	0.3	< 1	0.3	< 0.2	< 1	< 1
0803	N	10/23/1991	no data	6.60	7.39	5402	786	448	263	9.5	1273	2446	174	1.25	35.3	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.02	no data	0.57	< 0.1	< 0.05	< 0.001	< 0.1	0.135	< 0.2	2.4	2.4	< 0.2	< 1	< 1
0803	N	1/16/1992	no data	6.50	7.19	5155	706	398	255	9.8	1375	2451	160	1.66	51.8	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.47	< 0.1	< 0.05	0.003	< 0.1	0.056	0.3	< 1	0.3	< 0.2	< 1	< 1

TABLE A.1

Southwest Alluvium Data Summary, 1989-2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
0803	N	4/13/1992	no data	6.30	7.01	5265	685	360	242	10.3	1571	2346	180	1.87	19.1	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.43	< 0.1	< 0.05	0.002	< 0.1	0.138	< 0.2	< 1	0	< 0.2	< 1	< 1
0803	N	7/8/1992	no data	6.20	7.46	4617	804	384	272	11.5	1611	2192	137	1.9	25.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.3	< 0.1	< 0.05	< 0.001	< 0.1	0.04	0.3	< 1	0.3	< 0.2	< 1	< 1
0803	N	10/8/1992	no data	6.50	7.79	5982	827	464	347	14	1952	2661	185	0.75	15.7	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.01	< 0.05	0.61	< 0.1	< 0.05	< 0.001	< 0.1	0.068	0.8	< 1	0.8	< 0.2	< 1	< 1
0803	N	1/7/1993	no data	6.30	7.32	5851	851	430	305	12.1	1879	2522	185	1.08	38.8	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.64	< 0.1	< 0.05	0.003	< 0.1	0.085	< 0.2	< 1	0	< 0.2	1.2	< 1
0803	N	4/7/1993	no data	6.40	7.14	5631	773	481	324	8.7	1806	2666	176	0.9	45.3	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.98	< 0.1	< 0.05	< 0.001	< 0.1	0.17	0.3	< 1	0.3	< 0.2	< 1	< 1
0803	N	7/14/1993	no data	6.60	7.24	5726	895	452	303	9.8	1878	2833	178	1.09	21.7	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.03	< 0.1	< 0.05	< 0.001	< 0.1	0.062	< 0.2	1.4	1.4	< 0.2	< 1	< 1
0803	N	10/7/1993	no data	6.50	7.20	5445	821	451	262	10.2	2000	2482	174	1.12	33.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.12	< 0.1	< 0.05	< 0.001	< 0.1	0.069	0.3	7.9	8.2	< 0.2	< 1	< 1
0803	N	1/6/1994	no data	6.70	7.12	5648	776	460	307	9.2	1656	2754	170	0.92	31.6	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.92	< 0.1	< 0.05	< 0.001	< 0.1	0.07	0.5	< 1	0.5	< 0.2	< 1	< 1
0803	N	4/12/1994	no data	6.50	7.10	6510	770	519	292	9.9	1743	3205	175	1.03	28	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.72	< 0.1	< 0.05	< 0.001	< 0.1	0.1	0.6	< 1	0.6	< 0.2	3.2	< 1
0803	N	7/27/1994	no data	6.50	7.41	6003	909	456	303	11.3	1890	2956	172	0.74	24	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.17	< 0.1	< 0.05	0.004	< 0.1	0.108	0.9	5.4	6.3	< 0.2	< 1	1.4
0803	N	10/5/1994	no data	6.30	7.49	5943	846	503	302	10.6	1845	2713	163	1.28	31.3	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.34	< 0.1	< 0.05	< 0.001	< 0.1	0.068	< 0.2	< 1	0	< 0.2	2.2	< 1
0803	N	1/4/1995	no data	6.40	7.16	6350	928	539	300	12.1	1948	2885	184	1.12	34.3	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.08	< 0.1	< 0.05	< 0.001	< 0.1	0.071	0.8	< 1	0.8	< 0.2	< 1	< 1
0803	N	4/6/1995	no data	6.40	6.73	6220	810	498	281	10.1	1935	3018	196	1.03	22.7	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.1	< 0.1	< 0.05	< 0.001	< 0.1	0.074	< 0.2	< 1	0	< 0.2	1.1	< 1
0803	N	7/6/1995	no data	6.50	7.41	6150	840	535	305	11.2	1848	2870	198	0.88	30.7	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.16	< 0.1	< 0.05	0.001	< 0.1	0.086	< 0.2	< 1	0	< 0.2	< 1	1.3
0803	N	10/4/1995	no data	6.80	7.36	6000	786	556	284	9.9	2017	2840	180	1.09	33.6	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.07	< 0.1	< 0.05	0.002	< 0.1	0.079	< 0.2	< 1	0	< 0.2	< 1	< 1
0803	N	1/3/1996	no data	6.50	7.16	6427	893	609	307	10.3	1929	3160	174	0.62	30.6	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.17	< 0.1	< 0.05	0.002	< 0.1	0.083	0.2	1	1.2	0.3	1.5	1
0803	N	4/2/1996	no data	6.60	7.43	6557	831	639	310	10.8	2014	3160	198	0.66	32.5	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.14	< 0.1	< 0.05	< 0.001	< 0.1	0.082	< 0.2	< 1	0	< 0.2	< 1	< 1
0803	N	7/17/1996	no data	6.30	6.70	6277	735	490	287	11.2	1967	2869	184	0.98	29	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.52	< 0.1	< 0.05	< 0.001	< 0.1	0.068	0.4	< 1	0.4	< 0.2	< 1	< 1
0803	N	10/8/1996	no data	6.40	7.03	6930	809	675	310	11.5	2022	3202	173	0.52	33.2	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.14	< 0.1	< 0.05	< 0.001	< 0.1	0.079	< 0.2	< 1	0	< 0.2	< 1	< 1
0803	N	1/28/1997	no data	6.50	7.87	6250	795	550	251	10.9	1847	3178	229	0.99	25.6	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.53	< 0.1	< 0.05	< 0.001	< 0.1	0.056	< 0.2	< 1	0	< 0.2	< 1	< 1
0803	N	4/8/1997	no data	6.40	7.52	6130	804	559	258	11.2	1800	2914	181	1.21	25.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.7	< 0.1	< 0.05	0.002	< 0.1	0.069	< 0.2	< 1	0	< 0.2	< 1	< 1
0803	N	7/8/1997	no data	6.60	7.39	6240	830	575	335	6.7	1790	2930	236	1.15	24.9	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.97	< 0.1	< 0.05	< 0.001	< 0.1	0.067	0.9	< 1	0.9	< 0.2	< 1	< 1
0803	N	10/8/1997	no data	6.30	7.60	6760	821	649	298	11.7	1990	2970	168	0.58	33.9	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.38	< 0.1	< 0.05	< 0.001	< 0.1	0.081	< 0.2	< 1	0	< 0.2	< 1	< 1
0803	N	1/20/1998	no data	6.30	7.75	6840	798	648	309	13	2000	3400	218	0.76	38.7	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.59	< 0.1	< 0.05	< 0.001	< 0.1	0.094	< 0.2	< 1	0	< 0.2	< 1	< 1
0803	N	4/7/1998	no data	6.50	7.40	6870	802	657	296	11.5	1990	3010	181	0.56	35.8	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.43	< 0.1	< 0.05	0.001	< 0.1	0.0901	< 0.2	< 1	0	< 0.2	< 1	< 1
0803	N	7/7/1998	no data	6.40	7.40	6940	785	667	310	11.9	2020	3000	198	0.64	51.8	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.52	< 0.1	< 0.05	< 0.001	< 0.1	0.0974	< 0.2	< 1	0	< 0.2	< 1	< 1
0803	N	10/6/1998	no data	6.44	7.56	6880	818	695	302	12.5	1980	3200	193	0.6	39.4	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.42	< 0.1	< 0.05	< 0.001	< 0.1	0.0976	< 0.2	< 1	0	< 0.2	< 1	< 1
0803	N	1/12/1999	no data	6.60	7.63	6980	745	642	272	11.9	1990	3300	184	0.71	39.1	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.47	< 0.1	< 0.05	< 0.001	< 0.1	0.0984	< 0.2	< 1	0	< 0.2	< 1	< 1
0803	N	4/13/1999	no data	6.50	7.65	6910	801	692	280	11.5	1960	3100	178	0.77	40.9	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.55	< 0.1	< 0.05	< 0.001	< 0.1	0.0889	< 0.2	< 1	0	< 0.2	< 1	< 1
0803	N	10/12/1999	no data	6.58	7.78	6990	731	671	260	11.5	2000	3040	175	0.78	37.5	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.62	< 0.1	< 0.05	< 0.001	< 0.1	0.0919	< 0.2	< 1	0	< 0.2	< 1	< 1
0803	N	1/11/2000	no data	6.60	7.66	7020	750	693	262	14.4	2000	3180	176	0.8	35.7	< 1	0.12	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.69	< 0.1	0.05	0.001	< 0.1	0.0891	0.6	< 1	0.6	< 0.2	< 1	< 1
0803	N	5/2/2000	no data	6.70	7.58	7050	670	637	256	13.5	2000	3030	161	0.86	42.8	< 1	0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.27	< 0.1	< 0.05	< 0.001	< 0.1	0.193	0.6	2.5	3.1	< 0.2	< 1	< 1
0803	N	7/12/2000	6,835.50	6.71	7.40	7250	712	737	328	6.76	2050	2890	184	1.24	77.5	1.7	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.95	< 0.1	< 0.05	< 0.001	< 0.1	0.197	0.4	< 1	0.4	< 0.2	< 1	< 1
0803	N	10/4/2000	6,834.50	6.65	7.31	7060	742	750	296	14.1	2010	3260	175	0.85	45.6	< 1	< 0.1	< 0.001	< 0.01	< 0.005	0.02	< 0.05	1.76	< 0.1	< 0.05	< 0.001	< 0.1	0.0841	0.5	1.3	1.8	< 0.2	< 1	< 1
0803	N	1/8/2001	6,839.90	6.50	7.78	7010	739	730	277	12.5	1970	3240	178	1.06	46.3	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.91	< 0.1	< 0.05	0.001	< 0.1	0.09	< 0.2	2.8	2.8	< 0.2	< 1	< 1
0803	N	2/5/2001	6,863.35	6.38	7.11	6820	826	784	268	13	1830	3380	163	0.67	40.7	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.37	< 0.1	< 0.05	0.001	< 0.1	0.1	0.6	< 1	0.6	< 0.2	no data	< 1
0803	N	3/5/2001	6,863.60	6.67	7.14	6810	726	716	320	12.4	1770	3320	129	0.73	39.1	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.75	< 0.1	0.05	0.001	< 0.1	0.0874	< 0.2	2.2	2.2	< 0.2	< 1	< 1
0803	N	4/9/2001	6,864.10	6.40	7.01	6630	798	768	222	12.1	1790	3460	149	0.81	43.9	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.29	< 0.1	< 0.05	< 0.001	< 0.1	0.1	< 0.2	< 1	0	< 0.2	< 1	< 1
0803	N	5/7/2001	6,863.95	6.43	7.30	7040	696	713	217	11.5	1760	2980	159	0.74	46.9	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.13	< 0.1	< 0.05	< 0.001	< 0.1	0.093	< 0.2	< 1	0	< 0.2	< 1	< 1
0803	N	6/4/2001	6,864.40	6.45	7.17	6750	700	723	202	11.6	1790	3280	164	0.84	47.8	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.34	< 0.1	< 0.05	0.004	< 0.1	0.086	0.4	< 1	0.4	< 0.2	< 1	< 1
0803	N	7/9/2001	6,864.30	6.95	6.96	6980	751	793	217	11.5	1820	3160	190	0.49	66	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.69	< 0.1	< 0.05	< 0.001	< 0.1	0.136	< 0.2	< 1	0	< 0.2	< 1	< 1
0803	N	8/6/2001	6,864.25	6.38	7.20	6950	690	730	220	12	1820	3000	200	0.4	57.6	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.1	< 0.1	< 0.05	< 0.001	< 0.1	0.16	< 0.2	< 1	0	< 0.2	< 1	< 1
0803	N	9/10/2001	6,864.40	6.49	7.30	6910	700	750	241	11.6	1900	3100	186	0.39	57.4	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.8	< 0.1	< 0.05	< 0.001	< 0.1	0.125	0.3	< 1	0.3	< 0.2	< 1	< 1
0803	N	10/1/2001	6,864.45	6.40	7.20	6940	670	710	231	12	1880	2800	215	0.45	56.4	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.6	< 0.1	< 0.05	< 0.001	< 0.1	0.148	0.8	< 1	0.8	< 0.2	< 1	< 1
0803	N	11/5/2001	6,864.75	6.40	7.40	7030	730	765	236	12.7	1830	3310	218	0.54	64	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.61	< 0.1	< 0.05	< 0.001	< 0.1	0.134	< 0.2	< 1	0	< 0.2	< 1	< 1
0803	N	12/3/2001	6,864.75	6.41	7.40	7120	688	726	221	11.9	1870	3020	191	0.65	62	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.4	< 0.1	< 0.05	< 0.001	< 0.1	0.128	< 0.2	< 1	0	< 0.2	< 1	< 1
0803	N	1/7/2002	6,864.75	6.46	7.00	6920	799	744	170	11.8	1830	3350	181	0.56	53.5	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.57	< 0.1	< 0.05	< 0.001	< 0.1	0.167	1	< 1	1	< 0.2	< 1	< 1
0803	N	2/4/2002	6,864.80	6.46	7.30	7000	775	738	246	11.9	1900	3250	191	0.7	51.1	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.63	< 0.1	< 0.05	< 0.001	< 0.1	0.149	< 0.2	< 1	0	< 0.2	< 1	< 1
0803	N	3/4/2002	6,864.70	6.42	7.20	7030	734	745	271	11.9	1880	3390	190	0.64	55.3	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.97	< 0.1	< 0.05	< 0.001	< 0.1	0.166	< 0.2	2.5	2.5	< 0.2	< 1	< 1
0803	N	4/1/2002	6,864.92	6.34	7.85	7070	770	761	274	13.7	1880	3480	197	0.73	51.2	1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.77	< 0.1	< 0.05	< 0.001	< 0.1	0.152	< 0.2	2.2	2.2	< 0.2	< 1	< 1
0803	N	5/6/2002	6,864.95	6.37	7.13	7010	734	718	259	12.5	1890	3140	182	0.72	55.4	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.87	< 0.1	< 0.05	< 0.001	< 0.1	0.174	< 0.2	< 1	0	< 0.2	< 1	< 1
0803	N	6/3/2002	6,865.10	6.32	7.44	7130	749	743	240	11	1910	3250	165	0.86	52.7	1.2	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.8	< 0.1	< 0.05	< 0.001	< 0.1	0.153	< 0.2	< 1	0	< 0.2	< 1	< 1
0803	N	7/8/2002	6,864.68	6.38	7.60	7110	711	725	214	10.9	1890	3150	148	0.78	51.3	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.77	< 0.1	< 0.05	< 0.001	< 0.1	0.201	0.4	< 1	0.4	< 0.2	< 1	< 1
0803	N	10/8/2002	6,864.60	6.33	7.44	5300	678	690	244	11.3	1880	3060	163	1.04	55.2	1.1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.6	< 0.1	< 0.05	< 0.001	< 0.1	0.132	< 0.2	< 1	0	< 0.2	< 1	< 1
0803	N	1/6/2003	6,864.48	6.47	7.27	6900	630	668	261	13.3	1870	2920	143	0.87	54	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.94	< 0.1	< 0.05	< 0.001	< 0.1	0.161	< 0.2	< 1	0	< 0.2	< 1	< 1.0
0803	N	4/7/2003	6,864.63	6.37	7.13	7000	693	732	269	15.3	1860	2940	174	0.74	51	1.2	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.98	< 0.1	< 0.05	< 0.001	< 0.1	0.126	0.5	< 1	0.5	< 0.2	< 1	< 1.0
0803	N	7/7/2003	6,864.01	6.22	7.37	6940	653	670	246	12.2	1850	2980	148	0.93	52	1.4	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.91	< 0.1	< 0.05	< 0.001	< 0.1	0.138	0.3	< 1	0.3	< 0.2	< 1	< 1.0
0803	N	10/6/2003	6,864.22	6.27	7.96	6860	724	776	287	11.5	1870	3370	165	1.05	49	1.2	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.34	< 0.1	< 0.05	< 0.001	< 0.1	0.164	< 0.2	< 1	0	< 0.2	< 1	< 1.0
0803	N	1/5/2004	6,864.16	6.46	7.25	6840	716	757	250	11.6	1900	3260	196	0.92	52.6 D	1.8	0.2	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.58	< 0.1	< 0.05	< 0.001	< 0.1	0.153 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0

TABLE A.1

Southwest Alluvium Data Summary, 1989-2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
0803	N	4/5/2004	6,864.43	6.58	6.80	6870	677	734	270	12.2	1890	3140 D	170	1.06	52.3 D	2	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.89	< 0.1	< 0.05	< 0.001	< 0.1	0.133 D	< 0.2	< 1	0	< 0.2	< 1	< 1
0803	N	7/12/2004	6,864.08	6.20	6.77	6980	694	717	295	12.4	1780	3090 D	170	1.03	51.2 D	1.5	< 0.1	< 0.001	< 0.01	< 0.005	0.02	< 0.05	1.83	< 0.1	< 0.05	< 0.001	< 0.1	0.141 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
0803	N	10/4/2004	6,863.76	6.30	7.01	7200	695 D	741 D	307	11.1	1830	3140 D	171	0.95	44 D	2	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.99	< 0.1	< 0.05	< 0.001	< 0.1	0.133 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
0803	N	1/3/2005	6,863.88	6.51	6.93	6890	691 D	735 D	272	11.3	1830	2970 D	159	1.01	49 D	1.9	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.84	< 0.1	< 0.05	< 0.001	< 0.1	0.144	0.4	1.8	2.2	< 0.2	< 1.0	1.9
0803	N	4/4/2005	6,863.99	6.48	7.21	6640	677	726	276	11.3	1860	3120	159	1.24	31	2.8	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.76	< 0.1	< 0.05	< 0.001	< 0.1	0.118	1	< 1.0	1	< 0.2	< 1.0	< 1.0
0803	N	7/11/2005	6,863.59	6.42	7.27	6690	725 D	774 D	274	11.9	1700	3310 D	182	1.19	53.9 D	2.9	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.08	< 0.1	< 0.05	< 0.001	< 0.1	0.136	0.3	< 1.0	0.3	< 0.2	< 1.0	< 1.0
0803	N	10/3/2005	6,863.27	6.45	7.08	6730	672 D	768 D	271	11.6	2070	2950 D	172	1.19	49.2 D	2.6	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.96	< 0.1	< 0.05	< 0.001	< 0.1	0.14	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
0803	N	1/9/2006	6,863.10	6.56	7.61	6640	658 D	742 D	260	11.4	1910	3280 D	152	1.02	49.0 D	2.6	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.36	< 0.1	< 0.05	< 0.001	< 0.1	0.125	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
0803	N	4/3/2006	6,863.08	6.39	7.02	6610	702 D	757 D	243	11.6	1800	3040 D	171	1.64	52 D	2.4	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.12	< 0.1	< 0.05	< 0.001	< 0.1	0.129 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
0803	N	7/17/2006	6,862.83	6.32	6.83	6490	655 D	776 D	298	12.6	1810	3520 D	174	1.33	50.3 D	2.8	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.05	< 0.1	< 0.05	< 0.001	< 0.1	0.139	0.5	2	2.5	< 0.2	< 1.0	1
0803	N	10/2/2006	6,862.68	6.37	6.66	6770	662 D	710 D	261	11.6	1860	3070 D	134	1.41	51.8 D	2.51	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.08	< 0.1	< 0.05	< 0.001	< 0.1	0.125	< 0.2	< 1	0	< 0.2	< 1	< 1
0803	N	1/8/2007	6,862.58	6.43	6.96	6800	646 D	689 D	248	11.8	1780	3000 D	156	1.66	52 D	3.09	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.94	<0.1	<0.05	<0.001	<0.1	0.126	<0.2	<1	0	<0.2	<1	<1
0803	N	4/9/2007	6,862.78	6.53	6.67	6460	652 D	720 D	257	13.3	1830	3110 D	167	1.47	52 D	3.15	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	2.16	<0.1	<0.05	<0.001	<0.1	0.124	<0.2	<1	0	<0.2	<1	1.1
0803	N	7/9/2007	6,862.48	6.33	6.82	6630	691 D	773 D	303	13.1	1900	3360 D	147	1.35	51 D	3.02	<0.1	0.01	<0.01	<0.005	<0.01	<0.05	1.9	<0.1	<0.05	<0.001	<0.1	0.123	<0.2	<1	0	<0.2	<1	<1
0803	N	10/1/2007	6,862.11	6.44	6.62	6670	635 D	700 D	276 D	12.9	1880	3080 D	169 D	1.64	47.7 D	3.9	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	2.13	<0.1	<0.05	<0.001	<0.1	0.129	<0.2	<1	0	<0.2	<1	1.3
0803	N	1/14/2008	6,861.93	6.47	6.61	6780	609 D	664 D	260 D	12.6	1810	2810 D	178 D	1.61	47 D	4.24	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.95	< 0.1	< 0.05	< 0.001	< 0.1	0.115	< 0.2	< 1	0	< 0.2	< 1	1
0803	N	4/7/2008	6,862.33	6.38	6.73	6460	678 D	777 D	310 D	15.2 D	1720	3310 D	135	2.0 D	68.1	3.89	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.01	< 0.1	< 0.05	< 0.001	< 0.1	0.118	-0.001 U	0.5 U	0.499	-0.05 U	0 U	1.1
0803	N	7/7/2008	6,861.98	6.22	6.74 H	6480 H	650	711	254 D	12	1840	3280 D	165	1.76	49.4 D	4.52	< 0.1	< 0.003	< 0.01	< 0.005	< 0.01	< 0.05	2.02	< 0.1	< 0.05	< 0.001	< 0.1	0.0994	-0.04 U	2.3	2.26	0 U	1.2 U	0.9
0803	N	10/6/2008	6,861.58	6.33	6.81	6740	671	721	276 D	12	1790	3410 D	163	1.9	48.6	5.88	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.66	< 0.1	< 0.05	< 0.001	< 0.1	0.11	-0.04 U	-0.04 U	-0.08	0.3	-6 U	1
0803	N	1/12/2009	6,861.43	6.37	6.66	6940	627	698	265	11	1810	3040 D	148	1	70.6 D	5.56	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.76	<0.1	<0.05	<0.001	<0.1	0.115	0.17 U	1.6	1.77	0.1 U	0 U	1.7
0803	N	4/6/2009	6,861.23	6.39	6.52	6470	641 D	714 D	297 D	12	1830	3190 D	155	1.33	52.2 D	5.64	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.78	<0.1	<0.05	<0.001	<0.1	0.125	0.22	0.55 U	0.77	0.01 U	-0.7 U	0.7
0803	N	7/6/2009	6,861.23	6.28	6.69	6820 H	671 D	731	296 D	14	1820	3360 D	173	2.13	47.8 D	4.52	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.48	<0.1	<0.05	<0.001	<0.1	0.0966	0.51	1.2 U	1.71	0.1 U	-0.4 U	1.1
0803	N	10/5/2009	6,860.88	6.43	7.09	6950	622 D	751	275 D	13	1820	3450 D	159	3.09	43 D	11.3	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	2.15	<0.1	<0.05	<0.001	<0.1	0.078	0.47	1.3 U	1.77	0.04 U	-0.8 U	0.9
0803	N	1/4/2010	6,860.48	6.46	7.09	7060 D	681 D	726	296	13	1910	3230 D	168	2.16	48 D	6.68	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.8	<0.1	<0.05	<0.001	<0.1	0.103	0.19	1.0 U	1.19	0.02 U	0.2 U	0.5 U
0803	N	4/5/2010	6,860.68	6.38	6.55	6810 DH	708 D	776	308 D	14	1990	3410 D	163	2.73	47.1 D	6.6	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.63	<0.1	<0.05	<0.001	<0.1	0.101	0.22	0.92 U	1.14	-0.04 U	2.1 U	0.2 U
0803	N	7/12/2010	6,860.33	6.34	6.97	7020 D	712 D	768	299 D	14	1960	3430 D	168 D	2.86	46 D	8.04	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.72	<0.1	<0.05	<0.001	<0.1	0.114	0.38	-0.1 U	0.28	0.1 U	-0.6 U	0.2 U
0803	N	10/4/2010	6,860.03	6.41	7.02	6920 D	648	710	294	14	1950	3410 D	163 D	2.86	45 D	7.52	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.97	<0.1	<0.05	<0.001	<0.1	0.118	0.18	0.71 U	0.89	0.08 U	0.7 U	0.03 U
0803	N	1/3/2011	6,859.98	6.34	6.62	6700 D	678 D	758	291 D	14	1850	3320 D	173 D	2.89	40 D	7.64	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	2.23	<0.1	<0.05	<0.001	<0.1	0.124	0.04 U	1.1	1.14	0.4	0.4 U	0.6 U
0803	N	4/4/2011	6,859.67	6.54	6.71	6670 D	686	744	310 D	14	1870	3380 D	173 D	2.66 D	47 D	7.24	<0.1	0.002	<0.01	<0.005	<0.01	<0.05	1.98	<0.1	<0.05	<0.001	<0.1	0.115	0.03 U	0.33 U	0.36	-0.003 U	-0.4 U	0.6
0803	N	7/11/2011	6,859.58	6.48	7.53	6530 D	670	756	313	14	1860	3310 D	168 D	3.0 D	47 D	8.08	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	2.22	<0.1	<0.05	<0.001	<0.1	0.115	0.05 U	0.68 U	0.73	-0.01 U	-0.3 U	1.8
0803	N	10/3/2011	6,859.28	6.51	6.79	6450 D	664	755	301	14	1750	3350 D	166 D	2.5 D	44 D	9.64	<0.1	0.003	<0.01	<0.005	<0.01	<0.05	2.12	<0.1	<0.05	<0.001	<0.1	0.11	0.08 U	1.1	1.18	0.0006 U	0.5 U	0.08 U
0803	N	1/2/2012	6,858.95	6.54	6.70 H	6790 D	680	742	300	15	1700	3300 D	171 D	3.1 D	48 D	9.92	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	2.01	<0.1	<0.05	<0.001	<0.1	0.118	0.51	0.56 U	1.63	0.003 U	0.5 U	0.5
0803	N	4/2/2012	6,859.28	6.67	6.52 H	7000 D	701	750	288	14	1780	3420 D	163 D	1.57	41 D	15.6	<0.1	<0.01	<0.01	<0.005	<0.01	<0.05	2.48	<0.1	<0.05	<0.001	<0.1	0.111	0.27	0.93	2.13	-0.008 U	0.5 U	0.1 U
0803	N	7/9/2012	6,858.70	6.40	6.61 H	6630	653	796	297	13	1810	3230 D	164 D	2.78	50 D	8.92	<0.1	<0.001	<0.001	<0.005	<0.01	0.002	2.31	<0.1	<0.05	<0.001	<0.1	0.102	0.37	0.38 U	1.13	-0.01 U	0.5 U	0.3 U
0803	N	10/8/2012	6,858.53	6.53	6.54 H	6590	678	723	283 D	14	1750	3300 D	160 D	1.8 D	38 D	8	<0.1	<0.001	<0.001	<0.005	<0.01	0.002	3.14	<0.1	<0.05	<0.001	<0.1	0.0781	0.14 U	1.3	1.3	0.009 U	0.04 U	0.7
0803	N	1/7/2013	6,858.57	6.46	6.57 H	6430	685	803	316 D	15	1850	3410 D	174 D	2.42	21 D	11	<0.1	<0.001	<0.001	<0.005	<0.01	0.001	2.15	<0.1	<0.05	<0.001	<0.1	0.0957	0.39	1.3	1.69	0.04 U	-0.1 U	0.5 U
0803	N	4/1/2013	6,858.32	6.50	6.57 H	6530	661	790	309	15	1870	3280 D	172 D	2.86	44 D	14.8	<0.1	<0.001	<0.001	<0.005	<0.01	0.002	2.34	<0.1	<0.05	<0.001	<0.1	0.106	0.22	0.64 U	0.22	0.05 U	-0.2 U	0.3 U
0803	N	7/8/2013	6,857.94	6.42	6.66 H	6780	624	736	276	12	1820	3320 D	166 D	1.84	38 D	9.04	<0.1	<0.001	<0.001	<0.005	<0.01	0.002	2.71	<0.1	<0.05	<0.001	<0.1	0.112	0.09 U	0.98	0.98	0.06 U	-0.04 U	0.3 U
0803	N	9/30/2013	6,857.92	6.51	6.60 H	6520 H	639	707	271	12	1720	3170 D	143 D	1.15	36 D	8.96	<0.1	<0.001	<0.001	<0.005	<0.01	0.001	2.92	<0.1	<0.05	<0.001	<0.1	0.104	0.23	0.55 U	0.23	0.07 U	0.2 U	-0.2 U
0803	N	1/6/2014	6,857.67	6.65	6.54	6460	594	708	270	12	1780	3230	159	1.79	38	1.23	<0.1	<0.001	<0.001	<0.005	<0.01	0.002	2.82	<0.1	<0.05	<0.001	<0.1	0.0922	0.37	1.8	2.17	0.06 U	-0.03 U	0.8
0803	N	3/31/2014	6,857.70	6.67	6.50 H	6570	565	668	261 D	12	1800	3220 D	166 D	2.43	38 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	0.001	2.5	<0.1	<0.05	<0.001	<0.1	0.0944	0.4	1.4	1.8	0.03 U	-0.7 U	1.2
0803	N	7/7/2014	6,857.50	6.65	6.64 H	6590	654	697	284 D	14	1870	3270 D	171 D	2.45	42 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	2.3	<0.1	<0.05	<0.001	<0.1	0.0842	0.27	0.83 U	0.27	0.03 U	0.5 U	0.4 U
0803	N	10/6/2014	6,857.24	6.59	6.56 H	6300	633	714	273	12	1710	3130 D	146 D	1.35	34 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	0.001	2.95	<0.1	<0.05	<0.001	<0.1	0.0783	0.2	0.87 U	0.2	0.002 U	0.08 U	0.3 U
0803	N	1/5/2015	6,856.96	6.72	6.67 H	6660	634	713	287	13	1720	3200 D	159 D	1.3	42 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	0.001	2.54	<0.1	<0.05	<0.001	<0.1	0.089	0.62	1.0 U	0.62	0.006 U	0.5 U	2
0803	N	4/6/2015	6,857.16	6.52	6.62 H	6380	627	712	275	12	1730	3290 D	171 D	1.49	79 D	<0.5	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	3.04	<0.1	<0.05	<0.001	<0.1	0.0805	0.41	0.97 U	0.41	-0.009 U	-0.1 U	1.8
0803	N	7/6/2015	6,856.84	6.42	6.57 H	6580	612	713	283	13	1840	3340 D	167 D	2.04	36 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	0.001	2.77	<0.1	<0.05	<0.001	<0.1	0.0943	0.19	1.6	1.79	0.04 U	0.1 U	1.2 U
0803	N	10/5/2015	6,856.61	6.67	6.60 H	6160 H	598	629	236	11	1500	3140 D	148 D	0.43	27 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	0.001	3.45	<0.1	<0.05	<0.001	<0.1	0.06	0.23	1.4	1.63	0.005 U	0.2 U	1.6
0803	N	1/4/2016	6,856.46	6.67	6.51 H	6530	636	709	275	13	1790	3300 D	166 D	1.0 D	16 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	2.67	<0.1	<0.05	<0.001	<0.1	0.0802	0.27	0.55 U	0.27	0.02 U	0.6 U	1.3
0803	N	4/4/2016	6,856.19	6.48	6.64 H	6560	641	713	294	12	1750	3290 D	166 D	0.94	36 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	2.27	<0.1	<0.05	<0.001	<0.1	0.0862	0.16 U	2.1	2.1	-0.02 U	0.5 U	3.9
0803	N	7/11/2016	6,856.18	6.54	6.60 H	6420 D	628	701	267	12	1700	3150 DH	153 DH	0.76	34 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	2.6	<0.1	<0.05	<0.001	<0.1	0.104	0.28	2.3	2.58	-0.001 U	0.1 U	1.1 U
0803	N	10/3/2016	6,856.12	6.68	6.61 H	6230 H	612	685	263	11	1640	3340 D	156 D	0.4	32 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	0.001	3.1	<0.1	<0.05	<0.001	<0.1	0.0653	0.23	0.27 U	0.23	0.0008 U	-0.2 U	7.1
0803	N	1/9/2017	6,855.72	6.67	6.57 H	6370 D	609	729	280	13	1750	3340 D	164 D	1.1	34 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	0.001	2.63	<0.1	<0.05	<0.001	<0.1	0.0752	0.32	0.92 U	0.32	0.05 U	-0.4 U	0.6 U
0803	N	4/3/2017	6,855.73	6.45	6.63 H	6020 D	637	643	253 D	13	1630	3320 D	159 D	0.5	31 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	0.001	3.41	<0.1	<0.05	<0.001	<0.1	0.073	0.21	2	2.21	0.1 U	-0.2 U	0.2 U
0803	N	7/10/2017	6,855.43	6.52	6.60 H	6510 D	597	680	273 D	13	1770	3100 D	162 D	1.72	32.8 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	0.003	2.69	<0.1	<0.05	<0.001	<0.1	0.0778	0.4	1.6	2	0.07 U	0.08 U	0.6 U
0803	N	10/2/2017	6,855.24	6.55	6.65 H	5870 DH	614	661	249 D	11	1590	2840 D	142 D	0.13	29.5 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	0.002	3.23	<0.1	<0.05	<0.001	<0.1	0.0696	0.03 U	0.8 U	0	0.002 U	1.5	0.8
0803	N	1/8/2018	6,854.94	6.64	6.60 H	6290 D	631	694	277 D	11	1590	3350 D	164 D	2.3 D	31.7 D	<0.50	0.04	<0.001	<0.001	<0.001	0.005	0.001	3.51 D	<0.001	0.006	<0.001	<0.01	0.0838	0.2	0.5 U	0.2	0.02 U	-0.2 U	1.1
0803	N	4/2/2018	6,855.02	6.54	6.60 H	6530 D	693 D	648	265 D	12	1650	3390 D	172 D	1.07	34.1 D	<0.50	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	3.11	<0.001	0.006	<0.001	<0.01	0.084	0.3	1.5	1.8	0.05 U	0.4 U	0.8
0803	N	7/9/2018	6,854.56	6.46	6.61 H	6390 D	593	678	289 D	13 D	1790	3160 D	174 D	1.53	38.6 D	<0.50	<0.03	<0.001	<0.001	<0.001	<0.005	0.002	2.52	<0.001	0.007	<0.001	<0.01	0.0965	0.4	1.2 U	0.4	0.02 U	0.2 U	0.8
0803	N	10/1/2018	6,854.32	6.60	6.58 H	6210 D	627	624	251 D	12	1570	3190 D	154 D	0.28	29.1 D	<0.50	0.04	<0.001	<0.001	<0.001	<0.005	0.001	3.55	<0.001	0.006	<0.001	<0.01	0.068	0.09 U	2.3	2.3	0.03 U	-0.1 U	0.3 U

TABLE A.1

Southwest Alluvium Data Summary, 1989-2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
0803	N	1/7/2019	6,854.14	6.51	6.62 H	6360 D	650	681	273	12	1640	3240 D	155 D	0.35	26.5 D	<0.50	<0.03	no data	<0.001	<0.001	<0.005	0.001	2.17	<0.001	<0.005	no data	<0.01	0.0717	0.1	1.6	1.7	0.05 U	0.5 U	0.9
0803	N	4/8/2019	6,853.98	6.50	6.62 H	6470 D	639	710	281	14	1750	3320 D	167 D	1.09	29.7 D	<0.50	<0.03	0.002	<0.001	<0.001	<0.005	0.002	2.64	<0.001	0.009	<0.001	0.02	0.0824	0.3	2	2.3	0.04 U	0.2 U	0.3 U
0803	N	7/15/2019	6,853.92	6.54	6.64 H	6640 D	584	677	270	13	1770	3370 D	172 D	1.37	29.2 D	<0.50	<0.03	<0.001	<0.001	<0.001	0.005	<0.001	2.62 D	<0.001	0.006	<0.001	<0.01	0.0839	0.4	1.2 U	1.6	0.04 U	0.1 U	0.8
0803	N	10/9/2019	6,853.73	6.72	6.63 H	3270 DH	631	667	269	12	1600	3220 D	156 D	0.37	27.7 D	<0.50	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	2.75 D	<0.001	0.007	<0.001	<0.01	0.0736	0.3	0.3	0.6	0.04 U	0.4 U	1.1
0808	N	1/8/2001	6,853.00	6.34	7.14	7470	720	721	382	14.5	2080	3400	233	16	26	1.4	6.02	0.001	< 0.01	< 0.005	0.13	< 0.05	18.1	< 0.1	0.09	0.001	< 0.1	0.082	< 0.2	< 1	0	< 0.2	< 1	< 1
0808	N	2/5/2001	6,863.60	6.46	7.04	5820	879	489	295	13.2	2040	2740	185	4.99	< 0.1	< 1	0.11	< 0.001	< 0.01	< 0.005	0.02	< 0.05	2.61	< 0.1	< 0.05	< 0.001	< 0.1	0.0338	0.4	2.1	2.5	< 0.2	< 1	< 1
0808	N	3/5/2001	6,863.85	6.65	7.43	5480	879	482	377	12.1	2100	2580	213	5.01	< 0.1	< 1	< 0.1	< 0.001	< 0.01	< 0.005	0.02	< 0.05	3.18	< 0.1	< 0.05	< 0.001	< 0.1	0.0338	< 0.2	< 1	0	< 0.2	< 1	< 1
0808	N	4/9/2001	6,864.40	6.65	7.04	6030	841	468	312	11.6	2130	2480	247	6.39	< 0.1	< 1	0.11	< 0.001	< 0.01	< 0.005	0.03	< 0.05	4	< 0.1	< 0.05	< 0.001	< 0.1	0.034	0.4	< 1	0.4	< 0.2	< 1	< 1
0808	N	5/7/2001	6,864.20	6.44	7.40	6600	797	577	359	8.6	2210	2540	216	1.66	60.2	< 1	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	1.91	< 0.1	< 0.05	< 0.001	< 0.1	0.074	< 0.2	< 1	0	< 0.2	< 1	< 1
0808	N	6/5/2001	no data	6.54	6.95	6680	843	582	361	9.2	2280	2790	238	2.11	32.4	1.8	0.2	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.47	< 0.1	< 0.05	< 0.001	< 0.1	0.059	< 0.2	< 1	0	< 0.2	< 1	< 1
0808	Filt	6/5/2001	6,864.50	6.46	6.90	6900	841	580	361	9.4	2270	2780	244	2.13	34.6	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.49	< 0.1	< 0.05	< 0.001	< 0.1	0.06	0.4	< 1	0.4	< 0.2	< 1	< 1
0808	N	7/9/2001	6,864.70	7.05	7.17	6870	830	710	320	6.3	1940	2800	246	0.16	119	3.3	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.69	< 0.1	< 0.05	0.001	< 0.1	0.165	< 0.2	< 1	0	< 0.2	< 1	< 1
0808	N	8/6/2001	6,864.55	6.40	7.20	6860	700	620	290	7.5	1950	2500	210	0.09	116	2.9	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.71	< 0.1	< 0.05	< 0.001	< 0.1	0.194	< 0.2	< 1	0	< 0.2	< 1	< 1
0808	N	9/10/2001	6,864.75	6.40	7.20	6750	720	610	300	6.1	1960	2500	150	0.41	140	2.9	0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.97	< 0.1	< 0.05	< 0.001	< 0.1	0.253	0.9	2.8	3.7	< 0.2	< 1	< 1
0808	N	10/1/2001	6,864.80	6.47	7.40	6780	720	630	214	6.5	1970	2400	165	0.08	122	2.4	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.55	< 0.1	< 0.05	< 0.001	< 0.1	0.157	0.3	< 1	0.3	< 0.2	< 1	< 1
0808	N	11/5/2001	6,865.00	6.48	7.50	6800	782	656	280	7.6	1900	2750	237	0.06	142	3.1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.61	< 0.1	< 0.05	< 0.001	< 0.1	0.14	< 0.2	< 1	0	< 0.2	< 1	< 1
0808	N	12/3/2001	6,865.10	6.53	7.50	6780	726	605	244	6.7	1940	2460	212	0.11	147	2.4	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.56	< 0.1	< 0.05	< 0.001	< 0.1	0.147	< 0.2	< 1	0	< 0.2	< 1	< 1
0808	N	1/7/2002	6,865.05	6.53	7.20	6810	854	670	232	8.7	1910	2870	230	0.05	117	3.4	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.59	< 0.1	< 0.05	< 0.001	< 0.1	0.138	< 0.2	< 1	0	< 0.2	< 1	< 1
0808	N	2/4/2002	6,865.10	6.52	7.30	6830	829	649	265	7.7	1960	2750	226	0.08	118	3.3	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.64	< 0.1	< 0.05	< 0.001	< 0.1	0.145	< 0.2	< 1	0	< 0.2	< 1	< 1
0808	N	3/4/2002	6,865.05	6.49	7.30	6710	788	652	308	6.4	1920	2890	207	0.08	122	3.6	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.69	< 0.1	< 0.05	< 0.001	< 0.1	0.162	< 0.2	< 1	0	< 0.2	< 1	< 1
0808	N	4/1/2002	6,865.31	6.36	7.84	6820	810	663	310	7.4	1930	2930	207	0.07	117	4.1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.7	< 0.1	< 0.05	< 0.001	< 0.1	0.15	< 0.2	< 1	0	< 0.2	< 1	< 1
0808	N	5/6/2002	6,865.34	6.39	7.15	6900	773	644	287	7.6	1950	2690	208	0.16	125	4	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.71	< 0.1	< 0.05	< 0.001	< 0.1	0.148	< 0.2	< 1	0	< 0.2	< 1	< 1
0808	N	6/3/2002	6,865.45	6.35	7.36	6810	781	655	270	5.9	1960	2750	173	0.09	120	4.8	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.65	< 0.1	< 0.05	< 0.001	< 0.1	0.142	< 0.2	< 1	0	< 0.2	< 1	< 1
0808	N	7/8/2002	6,865.08	6.46	7.63	6950	782	682	230	7.3	1960	2850	173	0.15	115	4.2	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.64	< 0.1	< 0.05	< 0.001	< 0.1	0.169	0.3	< 1	0.3	< 0.2	< 1	< 1
0808	N	10/7/2002	6,864.81	6.38	7.19	5260	705	620	290	5.2	1970	2630	168	< 0.05	113	5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.65	< 0.1	< 0.05	< 0.001	< 0.1	0.115	< 0.2	< 1	0	< 0.2	< 1	< 1
0808	N	1/6/2003	6,864.89	6.64	7.32	6900	655	609	283	9.7	1910	2510	144	0.12	131	5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.65	< 0.1	< 0.05	< 0.001	< 0.1	0.138	< 0.2	< 1	0	< 0.2	< 1	< 1.0
0808	N	4/7/2003	6,865.02	6.43	6.71	6870	753	657	308	7.9	1910	2600	194	0.13	125	5.1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.68	< 0.1	< 0.05	< 0.001	< 0.1	0.126	< 0.2	< 1	0	< 0.2	< 1	< 1.0
0808	N	7/7/2003	6,864.94	6.24	7.61	7130	720	640	267	7.9	1900	2740	170	0.3	122	6.8	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.6	< 0.1	< 0.05	< 0.001	< 0.1	0.115	< 0.2	< 1	0	< 0.2	< 1	< 1.0
0808	N	10/6/2003	6,864.67	6.25	7.52	7000	784	719	326	5.2	1880	3030	180	0.16	127	6.3	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.74	< 0.1	< 0.05	< 0.001	< 0.1	0.15	< 0.2	< 1	0	< 0.2	< 1	< 1.0
0808	N	1/5/2004	6,864.60	6.51	7.40	6810	768	705	269	6.2	1900	2950	200	0.1	123 D	6.5	0.2	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.7	< 0.1	< 0.05	< 0.001	< 0.1	0.122 D	< 0.2	2.5	2.5	< 0.2	< 1.0	< 1.0
0808	N	4/5/2004	6,864.98	6.69	6.83	6850	730	669	304	5.8	1880	2760 D	182	0.2	135 D	6.7	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.62	< 0.1	< 0.05	0.002	< 0.1	0.135 D	< 0.2	< 1	0	< 0.2	< 1	< 1
0808	N	7/12/2004	6,864.56	6.23	6.85	7030	751	663	323	6.4	1850	2760 D	186	0.12	128 D	5.3	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.58	< 0.1	< 0.05	0.001	< 0.1	0.131 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
0808	N	10/4/2004	6,864.17	6.30	7.05	7070	742 D	681 D	334	4.6	1840	2840 D	185	0.13	118 D	7.2	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.62	< 0.1	< 0.05	0.001	< 0.1	0.116 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
0808	N	1/3/2005	6,864.32	6.58	6.92	6880	739 D	663 D	301	5.6	1800	2620 D	174	0.08	110 D	6.6	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.58	< 0.1	< 0.05	< 0.001	< 0.1	0.135	0.3	< 1.0	0.3	< 0.2	< 1.0	< 1.0
0808	N	4/4/2005	6,864.50	6.53	7.23	6460	728	641	304	4.5	1850	2700	168	< 0.05	94	6.8	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.62	< 0.1	< 0.05	< 0.001	< 0.1	0.125	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
0808	N	7/11/2005	6,864.03	6.44	7.19	6680	750 D	676 D	286	5.2	1670	2820 D	198	0.09	125 D	8.7	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.62	< 0.1	< 0.05	< 0.001	< 0.1	0.124	0.3	< 1.0	0.3	< 0.2	< 1.0	< 1.0
0808	N	10/3/2005	6,863.82	6.45	7.09	6700	730 D	695 D	306	4.8	1840	2610 D	169	0.13	120 D	7.3	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.61	< 0.1	< 0.05	< 0.001	< 0.1	0.134	< 0.2	1.7	1.7	< 0.2	< 1.0	< 1.0
0808	N	1/9/2006	6,863.57	6.63	7.55	6510	705 D	649 D	276	5.3	1850	2840 D	159	0.84	128 D	6.7	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.67	< 0.1	< 0.05	0.002	< 0.1	0.121	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
0808	N	4/3/2006	6,863.57	6.39	7.03	6580	767 D	676 D	264	4.9	1780	2650 D	171	0.14	128 D	5.8	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.63	< 0.1	< 0.05	0.002	< 0.1	0.131 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
0808	N	7/17/2006	6,863.32	6.33	6.97	6460	732 D	693 D	324	5.9	1800	3080 D	180	< 0.05	126 D	6.8	0.3	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.66	< 0.1	< 0.05	< 0.001	< 0.1	0.13	0.3	2.1	2.4	< 0.2	< 1.0	< 1.0
0808	N	10/2/2006	6,863.22	6.40	6.55	6450	733 D	639 D	271	5.4	1780	2710 D	131	0.11	129 D	6.08	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.63	< 0.1	< 0.05	< 0.001	< 0.1	0.12	< 0.2	< 1	0	< 0.2	< 1	< 1
0808	N	1/8/2007	6,863.07	6.57	6.77	6060	614 D	539 D	258	5.2	1760	2310 D	141	0.12	124 D	6.24	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.54	<0.1	<0.05	<0.001	<0.1	0.0992	<0.2	<1	0	<0.2	<1	<1
0808	N	4/9/2007	6,863.37	6.59	6.72	6220	725 D	645 D	274	6.6	1780	2740 D	182	0.05	138 D	7.08	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.65	<0.1	<0.05	<0.001	<0.1	0.126	<0.2	<1	0	<0.2	<1	<1
0808	N	7/9/2007	6,863.07	6.41	6.70	6560	744 D	674 D	313	5	1890	2920 D	152	<0.05	123 D	6.8	<0.1	0.01	<0.01	<0.005	<0.01	<0.05	0.55	<0.1	<0.05	<0.001	<0.1	0.126	<0.2	<1	0	<0.2	<1	<1
0808	N	10/1/2007	6,862.70	6.49	6.69	6620	681 D	609 D	300 D	5.3	1840	2610 D	187 D	<0.05	122 D	6.88	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.69	<0.1	<0.05	<0.001	<0.1	0.128	<0.2	<1	0	<0.2	<1	<1
0808	N	1/14/2008	6,862.53	6.53	6.56	6650	698 D	620 D	292 D	5.6	1800	2590 D	191 D	< 0.05	116 D	7	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.66	< 0.1	< 0.05	< 0.001	< 0.1	0.119	< 0.2	< 1	0	< 0.2	< 1	< 1
0808	N	4/7/2008	6,862.97	6.43	6.79	6210	739 D	679 D	330 D	7.0 D	1690	2840 D	162	< 0.05	134 D	6.6	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.66	< 0.1	< 0.05	< 0.001	< 0.1	0.124	-0.2 U	0.4 U	0.2	0.5	0 U	1.2
0808	N	7/7/2008	6,862.72	6.26	6.77 H	6240 H	712	633	279 D	4	1800	2900 D	167	< 0.05	124 D	7.6	< 0.1	< 0.003	< 0.01	< 0.005	< 0.01	< 0.05	0.72	< 0.1	< 0.05	< 0.001	< 0.1	0.119	-0.08 U	1.9	1.82	0.4	2 U	1
0808	N	10/6/2008	6,862.47	6.33	6.70	6500	729	644	296 D	4	1760	3010 D	166	< 0.1	159 D	9.44	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.53	< 0.1	< 0.05	< 0.001	< 0.1	0.115	-0.2 U	0.34 U	0.14	0.1 U	-2 U	1
0808	N	1/12/2009	6,862.07	6.36	6.72	6800	709	652	303	4	1800	2600 D	155	<0.05	123 D	7.68	0.2	<0.001	<0.01	<0.005	<0.01	<0.05	0.67	<0.1	<0.05	<0.001	<0.1	0.136	0.17 U	0.89 U	1.06	0.1 U	-2 U	1.1
0808	N	4/6/2009	6,861.87	6.42	6.49	6360	708 D	659 D	326 D	4	1850	2910 D	162	0.06	117 D	6.4	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.74	<0.1	<0.05	<0.001	<0.1	0.119	0.15	0.42 U	0.57	-0.008 U	-0.9 U	0.5 U
0808	N	7/6/2009	6,861.87	6.31	6.63	6800 H	769 D	673	313 D	5	1840	3020 D	180	<0.05	114 D	6.16	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.78	<0.1	<0.05	<0.001	<0.1	0.126	0.6	2.2	2.8	-0.2 U	0.2 U	3
0808	N	10/6/2009	6,861.37	6.34	7.09	6740	739 D	639	322	4	1880	3180 D	169	0.16	126 D	7	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.77	<0.1	<0.05	<0.001	<0.1	0.123	0.61	-0.3 U	0.31	-0.008 U	-0.6 U	0.1 U
0808	N	1/4/2010	no data	no data	6.84	6920 D	713 D	643	302	4	1940	3320 D	173	<0.05	129 D	5.24	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.79	<0.1	<0.05	<0.001	<0.1	0.115	0.17	1.3 U	1.47	0.02 U	-1 U	0.3 U
0808	N	4/5/2010	6,861.32	6.44	6.58	6740 DH	802	759	362 D	5	2050	3030 D	174	0.21	111 D	5.56	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.78	<0.1	<0.05	<0.001	<0.1	0.126	0.21	1.5	1.71	0.04 U	1.2 U	0.2 U
0808	N	7/12/2010	6,861.02	6.34	6.80	6800 D	751 D	680	321 D	5	2020	2870 D	167 D	0.24	101 D	5.8	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.99	<0.1	<0.05	<0.001	<0.1	0.134	0.3	0.39 U	0.69	0.06 U	-0.6 U	0.2 U
0808	N	10/4/2010	6,860.77	6.43	7.46	6840 D	710	638	320	5	2030	3030 D	171 D	0.32	101 D	4.92	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.02	<0.1	<0.05	<0.001	<0.1	0.121	0.07 U	0.05 U	0.12	0.1 U	-0.02 U	-0.1 U
0808	N	1/3/2011	6,860.67	6.37	7.30	6360 D	759 D	693	315 D	5	1950	2870 D	178 D	<0.05	90 D	4.8	0.2	<0.001	<0.01	<0.005	<0.01	<0.05	1.02	<0.1	<0.05	<0.001	<0.1	0.126	0.008 U	0.80 U	0.808	0.08 U	0.2 U	0.6 U
0808	N	4/5/2011	6,860.39	6.53	6.73	6960 D	742	674	342 D	5	2010	2920 D	179 D	0.18	96 D	4.44	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.93	<0.1	<0.05	<0.001	<0.1	0.115	-0.06 U	0.69 U	0.63	0.005 U	-0.1 U	0.4

TABLE A.1

Southwest Alluvium Data Summary, 1989-2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
0808	N	7/11/2011	6,860.27	6.31	7.26	6640 D	714	682	341	5	2040	2960 D	179 D	0.4 D	95 D	4.52	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.06	<0.1	<0.05	<0.001	<0.1	0.128	-0.08 U	0.48 U	0.4	-0.004 U	0.2 U	0.1 U
0808	N	10/3/2011	6,860.00	6.46	6.77	6550 D	729	680	338	6	1920	3000 D	178 D	0.6 D	83 D	4.16	<0.1	0.003	<0.01	<0.005	<0.01	<0.05	1.2	<0.1	<0.05	<0.001	<0.1	0.122	0.15	0.71 U	0.86	0.02 U	-0.5 U	0.04 U
0808	N	1/2/2012	6,859.64	6.52	6.67 H	6790 D	761	718	336	6	1920	3020 D	183 D	0.14	88 D	4.28	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.97	<0.1	<0.05	<0.001	<0.1	0.128	0.21	0.49 U	1.19	0.03 U	0.1 U	0.1 U
0808	N	4/2/2012	6,859.97	6.63	6.55 H	6890 D	747	686	324	7	2070	3130 D	186 D	0.81	70 D	3.92	<0.1	<0.01	<0.01	<0.005	<0.01	<0.05	1.3	<0.1	<0.05	<0.001	<0.1	0.135	0.01 U	0.45 U	0.91	-0.005 U	0.008 U	0.07 U
0808	N	7/9/2012	6,859.42	6.46	6.61 H	7200	756	784	353 D	6	2100	3060 D	180 D	0.35	70 D	2.57	<0.1	<0.001	<0.001	<0.005	<0.01	0.002	1.25	<0.1	<0.05	<0.001	<0.1	0.126	0.4	-0.08 U	0.4	0.06 U	0.3 U	0.4
0808	N	10/8/2012	6,859.27	6.50	6.56 H	6630	765	713	349 D	7	2150	3150 D	193 D	1.24	57 D	2.04	<0.1	<0.001	<0.001	<0.005	<0.01	0.002	1.62	<0.1	<0.05	<0.001	<0.1	0.12	0.07 U	0.53 U	0	0.04 U	0.3 U	0.4 U
0808	N	1/7/2013	6,859.32	6.43	6.57 H	6490	727	728	370 D	8	2090	3160 D	184 D	0.94	48 D	1.9	<0.1	<0.001	<0.001	<0.005	<0.01	0.002	1.65	<0.1	<0.05	<0.001	<0.1	0.116	0.47	0.69 U	0.47	0.03 U	-0.07 U	0.005 U
0808	N	4/1/2013	6,859.07	6.49	6.71 H	6600	715	738	357	8	2120	3190 D	188 D	1.35	43 D	2.28	<0.1	<0.001	<0.001	<0.005	<0.01	0.002	1.68	<0.1	<0.05	<0.001	<0.1	0.116	0.03 U	0.49 U	0	0.02 U	0.1 U	0.5 U
0808	N	7/8/2013	6,858.70	6.41	6.64 H	7220	681	721	326	6	2130	3220 D	184 D	0.73	50 D	2.08	<0.1	<0.001	<0.001	<0.005	<0.01	0.004	1.59	<0.1	<0.05	<0.001	<0.1	0.132	0.10 U	1.4	1.4	-0.004 U	0.03 U	0.3 U
0808	N	9/30/2013	6,858.74	6.47	6.60 H	6700 H	661	678	348	9	2100	3070 D	171 D	2.47	26 D	1.11	<0.1	<0.001	<0.001	<0.005	<0.01	0.002	1.74	<0.1	<0.05	<0.001	<0.1	0.112	0.39	0.46 U	0.39	0.02 U	0.2 U	0.002 U
0808	N	1/6/2014	6,858.46	6.65	6.54	6680	682	750	346	7	2140	3260	179	0.94	42	1.4	<0.1	<0.001	<0.001	<0.005	<0.01	0.002	1.88	<0.1	<0.05	<0.001	<0.1	0.113	0.36	0.23 U	0.59	-0.01 U	0.3 U	0.6 U
0808	N	3/31/2014	6,858.53	6.61	6.48 H	6920	699	787	350 D	7	2130	3240 D	189 D	0.83	46 D	2.35	<0.1	<0.001	<0.001	<0.005	<0.01	0.002	1.74	<0.1	<0.05	<0.001	<0.1	0.126	0.22	1.8	2.02	-0.02 U	-0.6 U	0.2 U
0808	N	7/7/2014	6,858.31	6.53	6.60 H	7140	673	761	328 D	6	2160	3430 D	181 D	0.11	56 D	2.9	<0.1	<0.001	<0.001	<0.005	<0.01	0.002	1.42	<0.1	<0.05	<0.001	<0.1	0.113	0.06 U	0.32 U	0	-0.005 U	0.2 U	0.1 U
0808	N	10/6/2014	6,858.08	6.55	6.60 H	6750	669	725	356	8	2090	3220 D	182 D	1.73	31 D	1.85	<0.1	<0.001	<0.001	<0.005	<0.01	0.002	1.71	<0.1	<0.05	<0.001	<0.1	0.098	0.33	1.1 U	0.33	-0.004 U	0.2 U	0.4 U
0808	N	1/5/2015	6,857.72	6.68	6.65 H	6970	656	731	350	8	2000	3180 D	180 D	0.85	39 D	1.78	<0.1	<0.001	<0.001	<0.005	<0.01	0.001	1.64	<0.1	<0.05	<0.001	<0.1	0.113	0.52	0.80 U	0.52	-0.008 U	0.9 U	0.4 U
0808	N	4/6/2015	6,857.99	6.49	6.56 H	6970	669	790	346 D	7	2100	3530 D	212 D	0.78	45 D	2.61	<0.1	<0.001	<0.001	<0.005	<0.01	0.002	1.65	<0.1	<0.05	<0.001	<0.1	0.106	0.44	0.77 U	0.44	0.06 U	0.2 U	1.5 U
0808	N	7/6/2015	6,857.71	6.39	6.54 H	7050	645	784	342	8	2160	3440 D	196 D	0.78	47 D	2.78	<0.1	<0.001	<0.001	<0.005	<0.01	0.002	1.52	<0.1	<0.05	<0.001	<0.1	0.114	0.25	0.79 U	0.25	0.01 U	0.6 U	-0.1 U
0808	N	10/5/2015	6,857.34	6.52	6.56 H	6880 H	647	748	334	7	1960	3480 D	203 D	1.29	35 D	3.02	1.1	<0.001	<0.001	<0.005	<0.01	0.002	1.76	<0.1	<0.05	<0.001	<0.1	0.108	0.09 U	1.3	1.3	0.03 U	0.5 U	1.5
0808	N	1/4/2016	6,857.29	6.59	6.48 H	7020	640	790	338	7	2120	3440 D	196 D	0.7 D	36 D	2.51	<0.1	<0.001	<0.001	<0.005	<0.01	0.001	1.57	<0.1	<0.05	<0.001	<0.1	0.103	0.19	0.36 U	0.19	-0.008 U	-0.5 U	0.9 U
0808	N	4/4/2016	6,857.01	6.52	6.66 H	7140	636	817	355	6	2020	3390 D	191 D	0.12	49 D	2.51	<0.1	<0.001	<0.001	<0.005	<0.01	0.001	1.43	<0.1	<0.05	<0.001	<0.1	0.114	0.25	1.6	1.85	0.03 U	-0.4 U	-0.3 U
0808	N	7/11/2016	6,857.03	6.48	6.58 H	6910 D	646	775	350	8	2090	3130 D	184 DH	0.56	37 D	1.79	<0.1	<0.001	<0.001	<0.005	<0.01	0.002	1.68	<0.1	<0.05	<0.001	<0.1	0.0894	0.28	2.6	2.88	-0.003 U	-0.2 U	0.8 U
0808	N	10/3/2016	6,856.98	6.59	6.53 H	6650 H	635	697	355	9	2000	3340 D	184 D	0.57	22 D	1.2	<0.1	<0.001	<0.001	<0.005	<0.01	0.001	1.9	<0.1	<0.05	<0.001	<0.1	0.0729	0.37	1.4 U	0.37	-0.009 U	-0.2 U	3.8
0808	N	1/9/2017	6,856.55	6.56	6.56 H	6860 D	631	811	346	7	2050	3420 D	188 D	0.16	53 D	1.3	<0.1	<0.001	<0.001	<0.005	<0.01	0.001	1.62	<0.1	<0.05	<0.001	<0.1	0.108	0.26	0.32 U	0.26	0.04 U	0 U	0.6 U
0808	N	4/3/2017	6,856.55	6.39	6.53 H	6770 D	628	773	336 D	8	2060	3550 D	200 D	0.37	46 D	1.8	<0.1	<0.001	<0.001	<0.005	<0.01	0.001	1.64	<0.1	<0.05	<0.001	<0.1	0.102	0.2	0.75 U	0.2	0.07 U	-0.7 U	0.2 U
0808	N	7/10/2017	6,856.28	6.44	6.53 H	6850 D	597	754	311 D	7	2020	3210 D	192 D	0.1	47.8 D	1.5	<0.1	<0.001	<0.001	<0.005	<0.01	0.002	1.66	<0.1	<0.05	<0.001	<0.1	0.107	0.2	-0.6 U	0.2	0.09 U	0.1 U	0.6 U
0808	N	10/2/2017	6,856.19	6.52	6.62 H	6020 DH	645	641	337 D	9	1930	2820 D	172 D	1.21	18.7 D	0.58	<0.1	<0.001	<0.001	<0.005	<0.01	0.001	2.1	<0.1	<0.05	<0.001	<0.1	0.0841	0.3	0.8 U	0	0.07 U	0.3 U	0.6 U
0808	N	1/8/2018	6,855.80	6.63	6.56 H	6420 D	633	636	341 D	9	1780	3190 D	179 D	2.5 D	22.3 D	0.74	<0.03	<0.001	<0.001	<0.001	<0.005	0.001	2.24 D	<0.001	<0.005	<0.001	<0.01	0.0922	0.3	0.6 U	0.3	-0.02 U	-0.5 U	0.3 U
0808	N	4/2/2018	6,855.89	6.55	6.57 H	6630 D	714 D	621	333 D	9	1870	3340 D	189 D	2.2 D	19.3 D	0.5	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	2.28	<0.001	<0.005	<0.001	<0.01	0.0812	0.5	1.1	1.6	0.04 U	0.5 U	0.6
0808	N	7/9/2018	6,855.41	6.41	6.59 H	6900 D	598	711	335 D	9 D	1930	3230 D	184 D	1.4 D	38.7 D	0.62	<0.03	0.001	<0.001	<0.001	<0.005	0.002	1.92	<0.001	0.005	<0.001	<0.01	0.0931	0.3	1.6	1.9	0.08 U	-0.3 U	0.8
0808	N	10/1/2018	6,855.17	6.58	6.58 H	6520 D	643	635	348 D	10	1870	3290 D	179 D	1.18	13.5 D	<0.50	0.03	<0.001	<0.001	<0.001	<0.005	0.001	2.33	<0.001	<0.005	<0.001	<0.01	0.0739	0.3	1.7	2	0.008 U	0.05 U	0.6 U
0808	N	1/7/2019	6,854.99	6.47	6.53 H	6990 D	622	727	367 D	10	1990	3400 D	185 D	0.35	21.5 D	0.71	<0.03	no data	<0.001	<0.001	<0.005	0.002	1.49	<0.001	<0.005	no data	<0.01	0.0744	0.2	1.2	1.4	-0.0009 U	0.4 U	1.5
0808	N	4/8/2019	6,854.84	6.47	6.56 H	6830 D	651	744	322	8	1970	3430 D	186 D	0.24	34.4 D	0.6	0.48	0.003	<0.001	<0.001	<0.005	0.002	1.97	<0.001	0.009	<0.001	<0.01	0.0906	0.2	0.5 U	0.7	0.05 U	0.7 U	0.9
0808	N	7/15/2019	6,854.76	6.48	6.62 H	6950 D	597	737	314	8	1970	3440 D	183 D	0.28	39 D	0.55	0.04	<0.001	<0.001	<0.001	<0.005	0.002	1.91 D	<0.001	<0.005	<0.001	<0.01 D	0.0923	0.4	0.6 U	1	0.03 U	-0.2 U	0.6
0808	N	10/9/2019	6,854.62	6.64	6.64 H	6480 DH	621	698	345	11	1880	3290 D	180 D	0.79	24.5 D	<0.50 J	<0.03	<0.001	<0.001	<0.001	<0.005	0.001	1.68 D	<0.001	0.006	<0.001	<0.01	0.0802	0.3	1.3	1.6	0.1 U	0.4 U	1.4
0029 A	N	7/20/1989	6,879.40	7.20	7.04	4870	570	250	538	1.2	102	2362	38.3	0.15	183	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.02	< 0.05	0.08	< 0.1	< 0.05	0.002	< 0.1	0.0556	0.4	< 1	0.4	5.9	< 1	0.6
0029 A	N	10/16/1989	6,879.10	7.10	7.60	5144	518	240	662	1.3	546	2176	30.4	0.24	189	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	< 0.05	< 0.1	< 0.05	0.003	< 0.1	0.0396	0.3	< 1	0.3	1.1	< 1	1.5
0029 A	N	1/4/1990	6,878.60	6.90	7.28	5080	554	233	607	0.9	528	2333	42.5	0.09	190	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.039	< 0.2	< 1	0	< 0.2	1.9	< 1
0029 A	N	4/3/1990	no data	7.00	7.50	4981	567	240	573	0.9	582	2244	41.9	0.09	147	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.09	< 0.1	< 0.05	0.002	< 0.1	0.036	0.3	< 1	0.3	< 0.2	1.9	0.9
0029 A	N	7/2/1990	no data	7.00	7.48	5000	632	266	463	3.7	596	2268	38	< 0.05	172	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.11	< 0.1	< 0.05	< 0.001	< 0.1	0.0302	0.3	1.4	1.7	0.6	< 1	1
0029 A	N	10/2/1990	6,877.40	7.10	7.73	4778	520	231	472	0.8	558	2367	39.1	< 0.05	118	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.02	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.031	< 0.2	2.5	2.5	< 0.2	< 1	< 1
0029 A	N	1/15/1991	6,877.00	7.10	7.65	4825	580	242	516	3.5	494	2474	42.8	< 0.05	166	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.0416	< 0.2	< 1	0	< 0.2	< 1	< 1
0029 A	N	4/2/1991	6,876.80	6.90	7.49	4775	592	239	351	0.5	538	2368	39.6	< 0.05	160	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.02	< 0.1	< 0.05	0.002	< 0.1	0.0459	< 0.2	1.2	1.2	< 0.2	< 1	< 1
0029 A	N	7/16/1991	6,876.20	6.90	7.50	4595	579	221	347	1.1	598	2487	37.2	< 0.05	147	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.02	< 0.1	< 0.05	< 0.01	< 0.1	0.037	< 0.2	< 1	0	< 0.2	< 1	< 1
0029 A	N	10/14/1991	6,875.40	6.80	7.34	4672	490	204	365	1.1	571	2197	45.2	< 0.05	111	< 1	< 0.1	0.001	< 0.01	0.02	0.02	< 0.05	0.02	< 0.1	< 0.05	0.001	< 0.1	0.05	< 0.2	< 1	0	< 0.2	< 1	< 1
0029 A	N	1/14/1992	6,875.00	6.80	7.38	4512	560	239	329	0.7	607	2110	36.4	< 0.05	125	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.01	< 0.1	0.05	0.001	< 0.1	0.032	< 0.2	< 1	0	< 0.2	1.8	< 1
0029 A	N	4/9/1992	6,874.80	6.80	7.26	4656	574	235	432	1.6	531	2421	39	6.08	70.2	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	0.021	< 0.1	0.039	2.1	4.7	6.8	< 0.2	1.5	2.4
0029 A	N	7/14/1992	6,873.50	6.50	7.58	4599	644	242	419	1.4	518	2358	37.7	5	129	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.02	< 0.1	< 0.05	0.002	< 0.1	0.04	9.4	1.5	10.9	< 0.2	< 1	9.5
0029 A	N	10/13/1992	6,872.30	6.90	7.55	4147	584	267	417	1.7	588	2568	36.5	0.16	105	< 1	0.1	< 0.001	< 0.01	0.01	0.01	< 0.05	0.01	< 0.1	< 0.05	< 0.001	< 0.1	0.027	3.1	< 1	3.1	< 0.2	< 1	< 1
0029 A	N	1/12/1993	6,872.10	7.00	7.60	4274	591	219	415	3.2	558	2520	36.7	< 0.05	91.8	< 1	< 0.1	< 0.001	< 0.01	0.03	0.03	< 0.05	< 0.01	< 0.1	< 0.05	0.011	< 0.1	0.034	< 0.2	< 1	0	< 0.2	< 1	< 1
0029 A	N	4/14/1993	6,872.20	7.00	7.62	4349	569	212	373	3.1	568	2349	39.8	0.95	96.6	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.053	0.4	< 1	0.4	< 0.2	< 1	< 1
0029 A	N	7/15/1993	6,865.90	7.10	6.93	4135	591	201	342	8.6	589	2195	37.1	< 0.05	81.6	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.01	< 0.1	< 0.05	< 0.001	< 0.1	0.158	0.3	< 1	0.3	< 0.2	< 1	< 1
0029 A	N	10/7/1993	6,868.30	7.10	7.70	4425	586	212	345	< 0.1	549	2120	35.9	< 0.05	120	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.04	< 0.1	< 0.05	< 0.001	< 0.1	0.04	0.8	2.9	3.7	< 0.2	< 1	< 1
0029 A	N	1/6/1994	6,870.30	7.10	7.57	4264	567	206	370	0.3	544	2376	35.8	< 0.05	51.8	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.035	0.6	< 1	0.6	< 0.2	1.4	< 1
0029 A	N	4/14/1994	6,870.20	7.20	7.26	4070	557	207	344	0.5	576	2339	36	0.21	72.8	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.043	1	1.5	2.5	< 0.2	< 1	3.4
0029 A	N	7/21/1994	6,869.50	7.00	7.56	4233	678	229	324	< 0.1	630	2625	33	< 0.05	70.5	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.03	< 0.1	< 0.05	0.002	< 0.1	0.043	< 0.2	< 1	0	< 0.2	< 1	< 1
0029 A	N	10/5/1994	6,869.10	6.90	7.81	4347	641	221	344	0.8	593	2365	36.2	0.11	86	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.04	< 0.2	3.9	3.9	< 0.2	1.9	6.2
0509 D	N	7/19/1989	6,916.60	6.40	7.07	4652	819	290	198	10	1525	2017	176	0.06	50	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.29	< 0.1	< 0.05	< 0.001	< 0.1	0.111	0.6	1.5	2.1	6.9	2.8	6.8
0509 D	N	10/12/1989	6,915.80	6.40	6.98	4860	854	332	201	13.5	1703	2053	197	0.13	58	< 1	0.12	0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.39	< 0.1	< 0.05	0.001	< 0.1	0.105	0.8	< 1	0.8	< 0.2	2.3	1.2
0509 D	N	1/4/1990	6,915.30	6.10	6.54	4986	833	403	214	10.7	1745	2024	202	0.1	43	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.38	< 0.1	< 0.05	< 0.001	< 0.1	0.107	0.9	< 1	0.9	< 0.2	3.4	2.5

TABLE A.1

Southwest Alluvium Data Summary, 1989-2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
0509 D	N	4/3/1990	6,914.30	6.20	6.70	5192	794	411	210	11.2	1877	1996	220	0.1	39	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.43	< 0.1	< 0.05	< 0.001	< 0.1	0.106	0.7	< 1	0.7	< 0.2	< 1	1.4
0509 D	N	7/3/1990	6,913.40	6.30	6.74	5278	909	348	203	12	1898	2026	209	< 0.05	53.4	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.02	< 0.05	0.48	< 0.1	< 0.05	< 0.001	< 0.1	0.126	0.4	< 1	0.4	< 0.2	< 1	< 1
0509 D	N	10/3/1990	6,912.60	6.20	7.24	5373	847	358	252	12.2	1819	2118	221	< 0.05	38	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.02	< 0.05	0.55	< 0.1	< 0.05	0.002	< 0.1	0.074	< 0.2	< 1	0	< 0.2	1.9	< 1
0509 D	N	1/15/1991	6,908.00	6.30	7.15	5428	851	379	273	15.1	1463	2355	226	0.05	56.4	< 1	< 0.1	< 0.001	< 0.01	0.01	< 0.01	< 0.05	0.44	< 0.1	< 0.05	< 0.001	< 0.1	0.1202	0.8	< 1	0.8	1	< 1	< 1
0509 D	N	4/9/1991	6,907.50	6.60	7.25	4208	923	292	192	9.2	1218	1958	178	0.05	37	< 1	< 0.1	< 0.001	< 0.01	0.02	< 0.01	< 0.05	0.91	< 0.1	< 0.05	0.001	< 0.1	0.1274	0.5	< 1	0.5	< 0.2	2.9	< 1
0509 D	N	7/17/1991	6,906.80	6.30	7.35	5554	905	365	225	11	1826	2303	237	0.07	56.8	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.46	< 0.1	< 0.05	< 0.001	< 0.1	0.136	0.4	< 1	0.4	< 0.2	< 1	< 1
0509 D	N	10/15/1991	6,906.20	6.20	6.97	5616	917	432	253	12.3	1813	2407	239	< 0.05	22.5	< 1	< 0.1	0.001	< 0.01	< 0.01	0.01	< 0.05	0.5	< 0.1	< 0.05	0.001	< 0.1	0.132	0.5	7.6	8.1	< 0.2	< 1	< 1
0509 D	N	1/15/1992	6,905.50	6.10	7.16	4832	782	378	228	10.2	1206	2226	215	< 0.05	42.3	< 1	0.26	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.7	< 0.1	< 0.05	0.002	< 0.1	0.22	< 0.2	< 1	0	< 0.2	< 1	< 1
0509 D	N	4/8/1992	6,904.80	6.10	7.41	5122	822	437	258	11.6	1763	2392	227	< 0.05	33.3	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.61	< 0.1	< 0.05	0.004	< 0.1	0.124	< 0.2	1.1	1.1	< 0.2	1.9	< 1
0509 D	N	7/7/1992	6,904.00	6.00	7.80	5151	791	413	319	16.1	1253	2379	182	0.15	55.6	< 1	0.12	< 0.001	< 0.01	< 0.01	< 0.01	0.07	0.72	< 0.1	< 0.05	0.002	< 0.1	0.12	1	< 1	1	< 0.2	< 1	1.2
0509 D	N	10/6/1992	6,903.40	6.20	8.15	5913	913	451	293	12.1	1946	2358	230	< 0.05	62.5	< 1	0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.66	< 0.1	< 0.05	0.005	< 0.1	0.119	0.7	2.2	2.9	< 0.2	2.3	< 1
0509 D	N	1/6/1993	6,902.90	6.30	7.26	5281	453	995	156	8	2013	2878	262	0.81	84	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.86	< 0.1	< 0.05	0.005	< 0.1	0.003	1.5	4.9	6.4	< 0.2	< 1	1.7
0509 D	N	4/7/1993	6,902.30	6.30	7.00	5254	786	389	319	10.5	1797	2393	251	0.06	51.6	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.68	< 0.1	< 0.05	< 0.001	< 0.1	0.142	0.3	1.9	2.2	< 0.2	2.9	< 1
0509 D	N	7/14/1993	6,901.30	6.30	7.04	5055	810	402	283	11.4	1961	2101	257	< 0.05	47.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.74	< 0.1	< 0.05	< 0.001	< 0.1	0.082	0.5	2	2.5	< 0.2	< 1	< 1
0509 D	N	10/6/1993	6,900.60	6.50	7.00	5090	830	424	271	11.3	1787	2476	231	< 0.05	56.9	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.75	< 0.1	< 0.05	< 0.001	< 0.1	0.043	0.9	< 1	0.9	< 0.2	< 1	< 1
0509 D	N	1/6/1994	6,900.20	6.50	6.83	5480	814	438	293	10.6	1726	2583	240	0.16	39.6	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.81	< 0.1	< 0.05	< 0.001	< 0.1	0.081	0.4	< 1	0.4	< 0.2	1.1	< 1
0509 D	N	4/12/1994	6,899.50	6.50	6.75	5766	780	452	277	11.3	1660	2729	256	0.51	59.3	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.81	< 0.1	< 0.05	< 0.001	< 0.1	0.082	< 0.2	< 1	0	< 0.2	< 1	< 1
0509 D	N	7/21/1994	6,898.90	6.40	7.34	6216	918	487	295	11.7	1817	3043	246	0.39	54.1	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.88	< 0.1	< 0.05	0.004	< 0.1	0.075	0.4	4.7	5.1	< 0.2	y	5.5
0509 D	N	10/5/1994	6,898.60	6.20	7.59	6177	901	522	319	12.8	1800	2749	259	0.93	54.8	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.88	< 0.1	< 0.05	< 0.001	< 0.1	0.084	0.5	1.8	2.3	< 0.2	2.7	3.4
0509 D	N	1/5/1995	6,898.00	6.40	7.12	6296	880	542	298	14	1898	2693	271	1.05	49.7	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.85	< 0.1	< 0.05	< 0.001	< 0.1	0.084	0.6	1.6	2.2	< 0.2	< 1	3.2
0509 D	N	4/5/1995	6,897.30	6.50	6.92	6165	814	494	276	12	1856	2766	302	1.63	63	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.44	< 0.1	< 0.05	< 0.001	< 0.1	0.084	0.2	1.6	1.8	< 0.2	< 1	2.8
0509 D	N	7/6/1995	6,896.60	6.40	7.60	6186	835	510	300	13.5	1841	2602	299	1.54	46.5	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.91	< 0.1	< 0.05	0.001	< 0.1	0.0816	< 0.2	< 1	0	0.4	< 1	< 1
0509 D	N	10/3/1995	6,896.20	6.30	7.41	6534	820	545	296	13.6	1928	2825	292	2.22	50.5	< 1	< 0.1	0.003	< 0.01	< 0.01	< 0.01	< 0.05	0.82	< 0.1	< 0.05	0.002	< 0.1	0.084	0.8	< 1	0.8	< 0.2	< 1	1.7
0509 D	N	1/3/1996	6,895.70	6.50	6.96	5314	760	490	287	13.3	1903	2229	227	2.22	50.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.79	< 0.1	< 0.05	0.002	< 0.1	0.09	0.4	< 1	0.4	< 0.2	1.5	2
0509 D	N	4/2/1996	6,895.10	6.50	7.67	6804	800	610	324	15	1979	3030	342	3.86	53.6	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.86	< 0.1	< 0.05	< 0.001	< 0.1	0.101	< 0.2	< 1	0	< 0.2	< 1	< 1
0509 D	N	7/7/1996	6,890.10	6.20	7.04	6283	805	495	300	14.7	1769	2580	255	2.45	44.5	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.97	< 0.1	< 0.05	< 0.001	< 0.1	0.143	0.5	< 1	0.5	< 0.2	< 1	< 1
0509 D	N	10/1/1996	6,889.60	6.40	6.80	6440	818	578	308	15.2	1900	2795	297	3.97	86.1	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.9	< 0.1	< 0.05	0.007	< 0.1	0.088	0.6	< 1	0.6	< 0.2	< 1	< 1
0509 D	N	1/22/1997	6,889.20	6.30	7.21	6140	820	545	277	14.4	1900	2789	337	3.56	43.2	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.85	< 0.1	< 0.05	< 0.001	< 0.1	0.087	< 0.2	< 1	0	< 0.2	< 1	< 1
0509 D	N	4/8/1997	6,888.50	6.50	7.64	6430	825	581	328	15.7	1910	2869	345	5.09	48.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.97	< 0.1	< 0.05	0.028	< 0.1	0.099	0.5	< 1	0.5	< 0.2	< 1	< 1
0509 D	N	7/8/1997	6,888.00	6.80	7.61	6640	827	599	293	16.1	1900	2650	337	6.19	44.8	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.84	< 0.1	< 0.05	< 0.001	< 0.1	0.094	1.6	< 1	1.6	< 0.2	< 1	< 1
0509 D	N	10/7/1997	6,887.80	6.20	7.42	6530	807	584	302	16.2	1920	2850	350	6.7	44.5	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.21	< 0.1	< 0.05	< 0.001	< 0.1	0.089	< 0.2	< 1	0	< 0.2	< 1	1
0509 D	N	1/16/1998	6,887.20	6.60	7.75	6640	768	602	319	17.3	1930	3000	343	9.43	47.3	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.2	< 0.1	< 0.05	< 0.001	< 0.1	0.102	0.7	< 1	0.7	< 0.2	< 1	2.5
0509 D	N	4/7/1998	6,887.00	6.40	7.24	6390	805	610	310	16.2	1910	2950	274	8.49	46	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.8	< 0.1	< 0.05	< 0.001	< 0.1	0.101	0.6	< 1	0.6	< 0.2	< 1	< 1
0509 D	N	7/7/1998	6,886.60	6.70	7.64	6320	800	548	305	16.1	1890	2500	322	7.32	42.3	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.98	< 0.1	< 0.05	< 0.001	< 0.1	0.115	0.6	< 1	0.6	< 0.2	< 1	< 1
0509 D	N	10/6/1998	6,886.20	6.60	7.78	6960	815	689	353	19.9	1910	3050	312	13.8	44.4	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.83	< 0.1	< 0.05	< 0.001	< 0.1	0.105	0.6	< 1	0.6	< 0.2	< 1	< 1
0509 D	N	1/5/1999	6,885.70	6.60	7.76	6830	761	609	289	17.1	1970	3100	317	12.9	41.1	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.78	< 0.1	< 0.05	< 0.001	< 0.1	0.103	1	< 1	1	< 0.2	< 1	< 1
0509 D	N	4/6/1999	6,885.40	6.50	7.60	3780	805	630	289	17.6	1950	2830	345	13.1	9.53	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.89	< 0.1	< 0.05	< 0.001	< 0.1	0.104	1.1	< 1	1.1	< 0.2	< 1	< 1
0509 D	N	7/13/1999	6,884.84	6.50	7.72	6620	762	644	314	25.1	1540	3000	312	17.6	36.6	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.56	< 0.1	< 0.05	0.003	< 0.1	0.104	1.9	< 1	1.9	< 0.2	< 1	9.3
0509 D	N	10/5/1999	6,884.60	6.56	7.40	6290	847	664	307	18.6	1990	3070	317	0.05	35.4	< 1	< 0.1	< 0.001	< 0.01	0.008	< 0.01	< 0.05	1.05	< 0.1	< 0.05	< 0.001	< 0.1	0.108	0.5	< 1	0.5	< 0.2	< 1	< 1
0509 D	N	1/4/2000	6,884.20	6.70	7.59	6090	798	529	232	17.5	1980	2520	278	11.7	36.6	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.09	< 0.1	0.05	0.001	< 0.1	0.134	0.5	< 1	0.5	< 0.2	< 1	< 1
0509 D	N	5/3/2000	6,883.70	6.30	7.12	4990	859	337	241	13.2	2010	1570	293	0.6	32.7	1.9	0.2	< 0.001	< 0.01	0.005	< 0.01	< 0.05	1.6	< 0.1	< 0.05	< 0.001	< 0.1	0.176	< 0.2	2.6	2.6	< 0.2	< 1	< 1
0509 D	N	7/12/2000	6,883.30	6.31	7.18	4920	866	306	228	10.3	2110	1380	324	0.24	31.3	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.89	< 0.1	< 0.05	< 0.001	< 0.1	0.226	0.6	2.8	3.4	< 0.2	< 1	< 1
0509 D	N	10/3/2000	6,883.10	6.21	7.14	5090	893	372	240	13.5	2050	1990	350	1.9	31.2	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	0.07	2.05	< 0.1	< 0.05	< 0.001	< 0.1	0.184	0.7	< 1	0.7	< 0.2	< 1	< 1
0509 D	N	1/8/2001	6,882.70	6.46	7.47	5010	924	331	220	11.1	2200	1610	317	0.94	30.6	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.08	< 0.1	< 0.05	< 0.001	< 0.1	0.211	0.5	< 1	0.5	< 0.2	< 1	< 1
0509 D	N	2/5/2001	6,882.35	6.50	7.03	5090	1000	384	265	13.5	2090	1860	365	1.75	29.5	< 1	0.2	0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.2	< 0.1	< 0.05	< 0.001	< 0.1	0.197	0.6	< 1	0.6	< 0.2	< 1	< 1
0509 D	N	3/5/2001	6,882.10	6.65	7.41	5110	901	347	310	13.9	2100	1850	279	0.91	28.4	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.51	< 0.1	< 0.05	0.001	< 0.1	0.186	< 0.2	2.3	2.3	< 0.2	< 1	< 1
0509 D	N	4/3/2001	6,882.30	6.42	6.76	5120	984	366	211	11.8	2080	1800	311	0.82	31.8	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.53	< 0.1	< 0.05	< 0.001	< 0.1	0.183	0.5	< 1	0.5	< 0.2	< 1	< 1
0509 D	N	5/7/2001	6,881.90	6.46	7.01	5240	864	338	221	12.5	2060	1700	322	1.56	27.3	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.5	< 0.1	< 0.05	< 0.001	< 0.1	0.188	0.4	< 1	0.4	< 0.2	< 1	< 1
0509 D	N	6/4/2001	6,882.10	6.46	6.97	4860	848	336	232	12.7	2070	1760	318	1.92	30.2	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.42	< 0.1	< 0.05	< 0.001	< 0.1	0.186	0.9	< 1	0.9	< 0.2	< 1	< 1
0509 D	N	7/9/2001	6,881.80	6.36	6.84	5210	956	369	293	12.6	2180	1730	326	0.8	29.2	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.71	< 0.1	< 0.05	< 0.001	< 0.1	0.217	< 0.2	< 1	0	< 0.2	< 1	< 1
0509 D	N	8/6/2001	6,881.60	6.36	7.30	5210	890	340	230	13	2130	1500	370	0.61	26.6	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.8	< 0.1	< 0.05	< 0.001	< 0.1	0.22	0.7	< 1	0.7	< 0.2	< 1	< 1
0509 D	N	9/10/2001	6,881.40	6.38	7.20	5130	940	340	246	11.4	2210	1600	297	0.42	26	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.7	< 0.1	< 0.05	< 0.001	< 0.1	0.222	0.5	< 1	0.5	< 0.2	< 1	< 1
0509 D	N	10/1/2001	6,881.35	6.43	7.20	5190	920	320	234	12.1	2250	1570	411	0.37	25	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.46	< 0.1	< 0.05	< 0.001	< 0.1	0.225	0.5	< 1	0.5	< 0.2	< 1	< 1
0509 D	N	11/5/2001	6,881.30	6.47	7.40	5300	930	348	258	13.6	2300	1770	401	1.37	26.4	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.41	< 0.1	< 0.05	< 0.001	< 0.1	0.197	< 0.2	3.9	3.9	< 0.2	< 1	< 1
0509 D	N	12/3/2001	6,881.20	6.44	7.30	5370	875	338	237	12.3	2280	1590	357	2.14	29	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.33	< 0.1	< 0.05	0.001	< 0.1	0.252	< 0.2	< 1	0	< 0.2	< 1	< 1
0509 D	N	1/7/2002	6,881.00	6.41	6.80	5220	1040	354	229	11.8	2290	1840	383	1.1	23	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.49	< 0.1	< 0.05	< 0.001	< 0.1	0.206	1.2	< 1	1.2	< 0.2	< 1	< 1
0509 D	N	2/4/2002	6,880.80	6.48	7.10	5290	994	358	274	13.1	2170	1760	362	1.11	23.9	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.41	< 0.1	< 0.05	< 0.001	< 0.1	0.189	0.4	< 1	0.4	< 0.2	< 1	< 1
0509 D	N	3/4/2002	6,880.70	6.45	6.90	5220	934	342	262	12.6	2240	1790	376	0.9	24.4	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.91	< 0.1	< 0.05	< 0.001	< 0.1	0.228	< 0.2	< 1	0	< 0.2	< 1	< 1
0509 D	N	4/1/2002	6,880.68	6.36	7.69	5260	974	337	262	13.3	2250	1750	380	0.4	23.5	< 1	< 0.1	< 0.001	< 0.01	0.007	< 0.01	< 0.05	2.95	< 0.1	0.05	< 0.001	< 0.1	0.213	< 0.2	< 1	0	< 0.2	< 1	< 1

TABLE A.1
Southwest Alluvium Data Summary, 1989-2019
United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
0509 D	N	5/6/2002	6,880.55	6.38	7.74	5390	916	361	279	14.5	2120	1850	344	2.76	27.3	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.48	< 0.1	< 0.05	< 0.001	< 0.1	0.198	< 0.2	< 1	0	< 0.2	< 1	< 1
0509 D	N	6/3/2002	6,880.50	6.36	7.87	5200	949	331	244	11.1	2240	1500	318	0.32	24.5	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.99	< 0.1	0.05	< 0.001	< 0.1	0.192	< 0.2	2.7	2.7	< 0.2	< 1	< 1
0509 D	N	7/8/2002	6,880.17	6.57	7.83	5470	925	381	306	13.4	2160	1900	308	4.08	25	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.34	0.3	< 0.05	< 0.001	< 0.1	0.229	0.3	< 1	0.3	< 0.2	< 1	< 1
0509 D	N	10/7/2002	6,879.78	6.12	7.82	4290	856	333	254	11.9	2100	1750	300	1.17	26.4	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.47	< 0.1	< 0.05	< 0.001	< 0.1	0.159	< 0.2	< 1	0	< 0.2	< 1	< 1
0509 D	N	1/6/2003	6,879.36	6.53	6.84	5260	840	309	240	12.4	2150	1640	291	1.1	23.7	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.9	< 0.1	< 0.05	< 0.001	< 0.1	0.19	< 0.2	< 1	0	< 0.2	< 1	1.5
0509 D	N	4/7/2003	6,879.09	6.33	6.77	5320	887	344	275	18.6	2160	1700	330	2.1	23.3	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.45	< 0.1	< 0.05	< 0.001	< 0.1	0.19	< 0.2	< 1	0	< 0.2	< 1	< 1.0
0509 D	N	7/7/2003	6,878.81	6.20	7.28	5350	816	316	280	22.8	2120	1670	344	1.46	23.3	< 1	< 0.1	< 0.001	< 0.01	< 0.005	0.02	< 0.05	3.46	< 0.1	< 0.05	< 0.001	< 0.1	0.22	< 0.2	< 1	0	< 0.2	< 1	< 1.0
0509 D	N	10/6/2003	6,878.52	6.24	7.97	5360	901	362	297	13.6	2160	1840	338	2.21	21.4	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	3.1	< 0.1	< 0.05	< 0.001	< 0.1	0.231	< 0.2	< 1	0	< 0.2	< 1	< 1.0
0509 D	N	1/5/2004	6,877.96	6.38	7.86	5610	883	435	267	15.7	2270	2170	404	8.37	22.5 D	< 1.0	0.2	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.1	< 0.1	< 0.05	< 0.001	< 0.1	0.161 D	0.5	< 1.0	0.5	< 0.2	< 1.0	< 1.0
0509 D	N	4/5/2004	6,877.89	6.62	6.67	5300	912	344	291	12.3	2120	1710 D	350	1	20 D	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	3.26	< 0.1	< 0.05	0.001	< 0.1	0.24 D	< 0.2	< 1	0	< 0.2	< 1	< 1
0509 D	N	7/12/2004	6,877.38	6.22	6.67	5540	934	366	327	13.6	2380	1850 D	345	2.48	18.9 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	2.9	< 0.1	< 0.05	< 0.001	< 0.1	0.219 D	0.5	< 1.0	0.5	< 0.2	< 1.0	< 1.0
0509 D	N	10/4/2004	6,877.03	6.31	6.96	5430	853 D	322 D	308	11.7	2310	1660	349	0.59	17.1 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	3.13	< 0.1	< 0.05	< 0.001	< 0.1	0.211 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
0509 D	N	1/3/2005	6,876.74	6.51	6.89	5380	925 D	335 D	311	12.9	2360	1610 D	367	0.76	17.5 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	3.47	< 0.1	< 0.05	< 0.001	< 0.1	0.231	0.4	< 1.0	0.4	< 0.2	< 1.0	1.7
0509 D	N	4/4/2005	6,876.54	6.48	6.87	6050	906	360	329	12.3	2370	1810	344	0.47	14.7	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	3.1	< 0.1	< 0.05	< 0.001	< 0.1	0.215	0.9	< 1.0	0.9	< 0.2	< 1.0	< 1.0
0509 D	N	7/11/2005	6,876.04	6.38	7.10	5260	881 D	360 D	332	12.6	2330	1840 D	355	0.53	15.1 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	3.03	< 0.1	< 0.05	< 0.001	< 0.1	0.209	0.4	< 1.0	0.4	< 0.2	< 1.0	< 1.0
0509 D	N	10/3/2005	6,875.84	6.38	7.01	5460	875 D	430 D	323	13.7	2250	1890 D	327	3.93	14.9 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.36	< 0.1	< 0.05	< 0.001	< 0.1	0.197	< 0.2	1.7	1.7	< 0.2	< 1.0	< 1.0
0509 D	N	1/9/2006	6,875.35	6.51	7.42	5080	868 D	380 D	290	11.6 D	1600	2080 D	345	1.57	14.7 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.79	< 0.1	< 0.05	< 0.001	< 0.1	0.189	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
0509 D	N	4/3/2006	6,875.04	6.37	7.06	5260	817	356	296	12.6	1710	1820 D	323	1.28	13.8 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.91	< 0.1	< 0.05	< 0.001	< 0.1	0.187 D	0.6	< 1.0	0.6	< 0.2	< 1.0	< 1.0
0509 D	N	7/17/2006	6,874.74	6.28	6.78	5120	926 D	365 D	330	13.2	2210	1920 D	351	0.28	13.1 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	3.3	< 0.1	< 0.05	< 0.001	< 0.1	0.222	0.6	2.2	2.8	< 0.2	< 1.0	< 1.0
0509 D	N	10/2/2006	6,874.54	6.35	6.69	5180	816 D	350 D	312 D	14.1	2330	1760 D	297	2.15	13.7 D	< 0.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	3.03	< 0.1	< 0.05	< 0.001	< 0.1	0.227	< 0.2	< 1	0	< 0.2	< 1	< 1
0509 D	N	1/8/2007	6,874.05	6.44	6.40	5340	914 D	355 D	294	12.4	2260	1580	344	0.23	13.2 D	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	3.97	<0.1	<0.05	<0.001	<0.1	0.229	0.3	<1	0.3	<0.2	<1	<1
0509 D	N	4/9/2007	6,873.82	6.46	6.62	5280	925 D	342 D	326	12.8	2350	1630	361	0.08	12.8 D	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	4.14	<0.1	<0.05	<0.001	<0.1	0.243	<0.2	<1	0	<0.2	<1	1
0509 D	N	7/9/2007	6,873.69	6.33	6.69	5110	891 D	364 D	356	12.2	2450	1730	324	<0.05	12.4	<0.5	<0.1	0.008	<0.01	<0.005	<0.01	<0.05	2.25	<0.1	<0.05	<0.001	<0.1	0.24	<0.2	<1	0	<0.2	<1	1
0509 D	N	10/1/2007	6,873.39	6.41	6.75	5180	826 D	334 D	334 D	13.1	2340	1720 D	352 D	0.62	12.4	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	3.55	<0.1	<0.05	<0.001	<0.1	0.246	<0.2	<1	0	<0.2	<1	1.5
0509 D	N	1/14/2008	6,872.94	6.48	6.35	5030	886 D	337 D	334 D	13	2280	1660 D	374 D	0.12	13.3 D	< 0.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	3.6	< 0.1	< 0.05	< 0.001	< 0.1	0.232	< 0.2	< 1	0	< 0.2	< 1	1.6
0509 D	N	4/7/2008	6,873.04	6.37	6.70	5210	876 D	409 D	370 D	15.0 D	2150	1970 D	361	1.2 D	21.1	< 0.50	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.72	< 0.1	< 0.05	< 0.001	< 0.1	0.218	0.3	0.5 U	0.8	-0.07 U	0 U	1.6
0509 D	N	7/7/2008	6,872.84	6.19	7 H	5390 H	664	729	270 D	12	2340	2080 D	347	4.7	14.6	< 0.5	< 0.1	< 0.003	< 0.01	< 0.005	< 0.01	< 0.05	2.7	< 0.1	< 0.05	< 0.001	< 0.1	0.208	-0.08 U	1.6	1.52	0.5	2.7 U	1.3
0509 D	N	10/6/2008	6,872.54	6.30	6.60	5650	918	365	346 D	12	2340	1960 D	343	5.4	14.4	< 0.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.36	< 0.1	< 0.05	< 0.001	< 0.1	0.199	0.14 U	0.31 U	0.45	0.2	-2 U	1.7
0509 D	N	1/12/2009	6,872.19	6.32	6.69	5750	842	373	368	13	2300	1690 D	332	0.98	18.3	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	2.99	<0.1	<0.05	<0.001	<0.1	0.214	0.24	2.4	2.64	0.1 U	1.5 U	1.6
0509 D	N	4/6/2009	6,871.84	6.35	6.54	5860	820 D	389 D	380 D	13	2430	2090 D	333	2.3	13.5	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	2.61	<0.1	<0.05	0.001	<0.1	0.211	0.35	1.4	1.75	0.09 U	-5 U	1
0509 D	N	7/6/2009	6,871.84	6.24	6.67	5660	911 D	386	388 D	14	2450	2040 D	357	1.82	11	<0.50	0.2	<0.001	<0.01	<0.005	<0.01	<0.05	3.3	<0.1	<0.05	<0.001	<0.1	0.223	0.75	1.5	2.25	0.03 U	0.4 U	2.7
0509 D	N	10/5/2009	6,871.74	6.44	7.16	5600	878 D	418	379 D	13	2500	1910 D	367	4.3	11	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	3.35	<0.1	<0.05	<0.001	<0.1	0.239	0.69	0.89 U	1.58	0.05 U	4.0 U	1
0509 D	N	1/4/2010	6,871.24	6.54	6.71	5800 D	899 D	374	379 D	12	2610	2050 D	362	0.75	11.2	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	3.71	<0.1	<0.05	<0.001	<0.1	0.235	0.37	1.8	2.17	-0.01 U	-6 U	0.7 U
0509 D	N	4/5/2010	6,871.24	6.41	6.51	5690 DH	963 D	416	431 D	13	2660	2080 D	356	1.76	10.1 D	<0.50	0.1	<0.001	<0.01	<0.005	<0.01	<0.05	3.45	<0.1	<0.05	<0.001	<0.1	0.244	0.4	0.96 U	1.36	0.06 U	1.7 U	0.8
0509 D	N	7/12/2010	6,870.94	6.31	6.71	5820 D	948 D	418	399 D	13	2590	2130 D	365 D	4.05	9.8 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	3.25	<0.1	<0.05	<0.001	<0.1	0.26	0.39	0.51 U	0.9	0.001 U	-0.1 U	0.4 U
0509 D	N	10/4/2010	6,870.79	6.41	7.37	5570 D	882	424	418	14	2690	2040 D	359 D	4.8 D	9.2 D	<0.50	<0.1	0.001	<0.01	<0.005	0.01	<0.05	4.44	<0.1	<0.05	<0.001	<0.1	0.312	0.23	0.54 U	0.77	0.02 U	1 U	0.5 U
0509 D	N	1/3/2011	6,870.59	6.39	6.74	5820 D	917 D	460	429 D	14	2550	2230 D	368 D	5.5 D	8.1 D	<0.50	<0.1	<0.001	<0.01	<0.005	0.01	<0.05	3.5	<0.1	<0.05	<0.001	<0.1	0.264	0.11 U	0.51 U	0.62	0.06 U	0.1 U	1.5
0509 D	N	4/4/2011	6,870.14	6.55	6.68	5790 D	905	426	442 D	14	2530	2220 D	366 D	2.95 D	9.6 D	<0.50	<0.1	<0.001	<0.01	<0.005	0.01	<0.05	3.66	<0.1	<0.05	<0.001	<0.1	0.258	-0.03 U	0.76 U	0.73	0.05 U	-0.4 U	0.9
0509 D	N	7/11/2011	6,870.09	6.35	6.97	5600 D	876	440	443	13	2550	2150 D	350 D	4.9 D	9.0 D	<0.50	<0.1	0.005	<0.01	<0.005	0.01	<0.05	3.98	<0.1	<0.05	<0.001	<0.1	0.262	0.12 U	0.73 U	0.85	0.05 U	-0.3 U	0.9 U
0509 D	N	10/3/2011	6,869.85	6.47	7.65	5600 D	918	434	430	13	2420	2170 D	368 D	2.3 D	8.9 D	<0.50	<0.1	0.006	<0.01	<0.005	<0.01	<0.05	3.7	<0.1	<0.05	<0.001	<0.1	0.226	0.3	1.1	1.4	0.04 U	0.2 U	0.2 U
0509 D	N	1/2/2012	6,869.44	6.53	6.81 H	5370 D	916	395	402	13	2360	1840 D	356 D	0.99	8.9 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	4.02	<0.1	<0.05	<0.001	<0.1	0.268	0.77	1.0 U	2.77	0.04 U	-0.3 U	0.8
0509 D	N	4/2/2012	6,869.71	6.61	6.53 H	5510 D	933	389	399	14	2490	1870 D	346 D	1.1 D	8.8 D	<0.50	<0.1	<0.01	<0.01	<0.005	<0.01	<0.05	3.92	<0.1	<0.05	<0.001	<0.1	0.268	0.37	0.55 U	1.47	-0.05 U	0.2 U	0.3 U
0509 D	N	7/9/2012	6,869.12	6.32	6.58 H	5470 H	933	432	432 D	14	2530	2260 DH	214 DH	1.21	8.3 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	3.25	<0.1	<0.05	<0.001	<0.1	0.276	0.44	0.54 U	1.52	0.06 U	0.4 U	0.5
0509 D	N	10/8/2012	6,868.99	6.46	6.55 H	5420	856	407	403	13	2580	1830 D	364 D	1.53	7.6 D	<0.50	<0.1	<0.001	<0.001	<0.005	0.01	<0.001	3.83	<0.1	<0.05	<0.001	<0.1	0.283	0.3	1.9	2.2	0.02 U	0.7 U	0.5
0509 D	N	1/7/2013	6,868.89	6.47	6.57 H	5450	933	424	448 D	16	2460	2120 D	359 D	0.88	7.7 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	3.28	<0.1	<0.05	<0.001	<0.1	0.271	0.44	1.4	1.84	-0.01 U	0.2 U	0.9
0509 D	N	4/1/2013	6,868.61	6.46	6.58 H	5180	898	412	432	14	2560	1930 D	363 D	1.37	7.4 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	3.32	<0.1	<0.05	<0.001	<0.1	0.28	0.24	1.6	1.84	0.02 U	-0.3 U	1.1
0509 D	N	7/8/2013	6,868.27	6.42	6.57 H	5540	864	404	404	13	2520	1800 D	335 D	1.27	6.4 D	<0.50	<0.1	<0.001	<0.001	<0.005	0.01	<0.001	3.64	<0.1	<0.05	<0.001	<0.1	0.298	0.2	1.1	1.3	-0.003 U	0.4 U	0.9
0509 D	N	9/30/2013	6,868.17	6.49	6.54 H	5300 H	881	412	422	14	2600	1860 D	349 D	1.36	6.5 D	<0.50	<0.1	<0.001	<0.001	<0.005	0.01	<0.001	3.64	<0.1	<0.05	<0.001	<0.1	0.299	0.47	1	1.47	-0.02 U	0.3 U	0.5
0509 D	N	1/6/2014	6,867.84	6.64	6.49	5510	808	442	409	14	2560	2030	346	3.58	4.9	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	3.92	<0.1	<0.05	<0.001	<0.1	0.283	0.63	0.25 U	0.63	0.05 U	0.1 U	0.9
0509 D	N	3/31/2014	6,867.81	6.60	6.48 H	5300	786	382	370 D	12	2530	1860 D	360 D	<0.05	8.7 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	3.9	<0.1	<0.05	<0.001	<0.1	0.286	0.34	1.8	2.14	0.02 U	-1 U	0.5 U
0509 D	N	7/7/2014	6,867.56	6.46	6.62 H	5680	820	356	408 D	13	2450	2090 D	352 D	0.12	8.4 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	3.22	<0.1	<0.05	<0.001	<0.1	0.222	0.51	1.3	1.81	0.02 U	0.4 U	0.3 U
0509 D	N	10/6/2014	6,867.38	6.52	6.64 H	5500	864	345	399	12	2470	2010 D	353 D	0.34	10.9 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	3.16	<0.1	<0.05	<0.001	<0.1	0.27	0.5	3.5	4	0.04 U	-0.6 U	0.3 U
0509 D	N	1/5/2015	6,867.03	6.63	6.62 H	5880	824	374	410	13	2420	2100 D	339 D	0.07	9.2 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	2.99	<0.1	<0.05	<0.001	<0.1	0.264	0.41	1.2	1.61	0.07 U	-0.01 U	2.1
0509 D	N	4/6/2015	6,867.13	6.42	6.57 H	5410	862	343	399	12	2540	1950 D	417 D	<0.05	7.1 D	<0.5	<0.1	<0.001	<0.001	<0.005	0.01	<0.001	3.67	<0.1	<0.05	<0.001	<0.1	0.256	0.63	0.92 U	0.63	-0.006 U	-0.2 U	2.7
0509 D	N	7/6/2015	6,866.82	6.35	6.59 H	5720	822	341	391	12	2620	1900 D	355 D	2.99	4.3	<0.50	<0.1	0.001	<0.001	<0.005	0.01	<0.001	3.7	<0.1	<0.05	<0.001	<0.1	0.277	0.5	2.1	2.6	0.08 U	-0.3 U	1.1 U
0509 D	N	10/5/2015	6,866.69	6.51	6.57 H	5340 H	813	332	378	11	2340	1890 D	357 D	<0.05	5.9 D	<0.50	<0.1	<0.001	<0.001	<0.005	0.01	<0.001	3.72	<0.1	<0.05	<0.001	<0.1	0.254	0.29	1.5	1.79	0.02 U	0.1 U	5.9
0509 D	N	1/4/2016	6,866.55	6.57	6.50 H	5360	854	353	393	12	2560	1920 D	462 D	<0.05	7.1 D	<0.50	<0.1	<0.001	<0.001	<0.005	0.01	<0.001	3.87	<0.1	<0.05	<0.001	<0.1	0.258	0.46	1.5	1.96	0.1 U	0.4 U	1.9
0509 D	N	4/4/2016	6,866.18	6.41	6.61 H	5540	830	372	421	12	2360	2060 D	352 D	0.09	6.9 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	2.19	<0.1	<0.05	<0.001	<0.1	0.289	0.53	2.5	3.03	0.2	1.1 U	1.4 U
0509 D	N	7/11/2016	6,866.19	6.45	6.57 H	5460 D	852	352	403	12	2470	2030 D	372 D	<0.05	6.5 D	<0.50	<0.1	<0.001	<0.001	<0.005	0.01	<0.001	4	<0.1	<0.05	<0.001	<0.1	0.276	0.44	2	2.44	0.02 U	-0.04 U	1.5

TABLE A.1
Southwest Alluvium Data Summary, 1989-2019
United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
0509 D	N	10/3/2016	6,866.19	6.59	6.61 H	5730 H	820	356	409	12	2380	2250 D	345 D	<0.05	6.7 D	<0.50	<0.1	<0.001	<0.001	<0.005	0.01	<0.001	3.07	<0.1	<0.05	<0.001	<0.1	0.213	0.33	4.2	4.53	0.03 U	0.1 U	9.5
0509 D	N	1/9/2017	6,865.71	6.55	6.33 H	5960 D	846	437	425	14	2440	2520 D	341 D	1.1	9.1 D	<0.50	<0.1	0.001	<0.001	<0.005	0.02	<0.001	3.9	<0.1	<0.05	<0.001	<0.1	0.241	0.29	2.4	2.69	0.06 U	0.2 U	1.3
0509 D	N	4/3/2017	6,865.66	6.27	6.76 H	5650 D	884	383	407 D	13	2520	2420 D	339 D	0.16	7.1 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	4.5	<0.1	<0.05	<0.001	<0.1	0.237	0.42	2.3	2.72	-0.02 U	-0.4 U	1.2 U
0509 D	N	7/10/2017	6,865.39	6.41	6.57 H	5820 D	866	408	402 D	13	2490	2340 D	344 D	1.04	8.25 D	<0.50	<0.1	<0.001	<0.001	<0.005	0.01	<0.001	3.93	<0.1	<0.05	<0.001	<0.1	0.24	0.3	1.2 U	0.3	-0.006 U	0.6 U	0.7 U
0509 D	N	10/2/2017	6,865.36	6.41	6.60 H	5690 DH	877	417	413 D	13	2500	2100 D	339 D	0.2	8.70 D	<0.50	<0.1	<0.001	<0.001	<0.005	0.01	<0.001	4.36	<0.1	<0.05	<0.001	<0.1	0.264	0.3	1.5	1.8	0.05 U	-0.5 U	0.3 U
0509 D	N	1/8/2018	6,864.97	6.59	6.56 H	5420 D	857	363	397 D	12	2330	2160 D	351 D	<0.05	9.05 D	<0.50	<0.03	<0.001	<0.001	<0.001	0.012	<0.001	4.39 D	0.001	0.008	<0.001	<0.01	0.272	0.4	0.9 U	0.4	0.0007 U	-0.09 U	0.5 U
0509 D	N	4/2/2018	6,864.92	6.53	6.65 H	5880 D	932 D	365	382 D	12	2240	2440 D	362 D	0.1	9.20 D	<0.50	0.05	<0.001	<0.001	<0.001	0.014	<0.001	3.38	0.003	0.008	<0.001	<0.01	0.248	0.5	1.6	2.1	-0.02 U	0.9 U	0.9
0509 D	N	7/9/2018	6,864.52	6.41	6.66 H	5600 DH	776	349	398 D	12	2350	2030 D	337 D	<0.05	10.9 D	<0.50	<0.03	<0.001	<0.001	<0.001	0.008	<0.001	3.22	<0.001	0.008	<0.001	<0.01	0.272	0.4	1.3 U	0.4	0.02 U	0.2 U	0.9
0509 D	N	10/1/2018	6,864.41	6.50	6.53 H	5680 D	845	354	412 D	13	2330	2180 D	338 D	<0.05	9.75 D	<0.50	0.04	<0.001	<0.001	<0.001	0.013	<0.001	3.74	0.002	0.006	<0.001	<0.01	0.237	0.3	2.4	2.7	0.04 U	0.3 U	1.7
0509 D	N	1/7/2019	6,864.11	6.21	6.66 H	5740 D	857	404	417	14	2620	2260 D	325 D	0.14	11.6 D	<0.50	<0.03	no data	<0.001	<0.001	0.008	<0.001	3.12	0.001	0.007	no data	<0.01	0.227	0.4	0.1 U	0.5	-0.005 U	-0.3 U	0.4 U
0509 D	N	4/11/2019	6,863.93	6.36	6.58 H	5620 D	560	385	328 D	12	2360	2210 D	343		11 d	no data	0.06	0.005	no data	no data	0.01	no data	2.64	0.001	0.01	0.003	0.02	0.224	0.2	1.1 U		0.03 U	0.4 U	0.5 U
0509 D	N	7/8/2019			6.58	5620	860	385	343	12	2360	2210	328	<0.05	11	<0.50	0.06	0.005	<0.001	<0.001	0.01	<0.001	2.64	0.001	0.01	0.003	0.02	0.224	0.2	1.1	1.3	0.03	0.4	0.5
0509 D	N	7/15/2019	6,863.82	6.47	6.69 H	5620 D	821	368	384	12	2320	2100 D	329 D	<0.05	12.2 D	<0.50	<0.03	0.001	<0.001	<0.001	0.009	<0.001	3.01 D	<0.001	0.006	<0.001	<0.01	0.245	0.4	1.2 U	1.6	0.03 U	-0.07 U	0.5
0509 D	N	10/9/2019	6,863.79	6.54	6.65 H	5870 DH	781	459	412	15	2250	2400 D	331 D	0.14	19.3 D	<0.50	<0.03	0.001	<0.001	<0.001	0.008	<0.001	1.85 D	<0.001	0.007	<0.001	<0.01	0.216	0.4	1 U	1.4	0.03 U	0.4 U	0.7
EPA 22A	N	7/25/1989	6,914.50	7.10	6.95	1384	311	59	84	3.1	542	646	10.7	0.06	0.2	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.08	< 0.1	< 0.05	< 0.001	< 0.1	0.0276	0.5	< 1	0.5	1.3	< 1	< 1
EPA 22A	N	10/8/1989	6,913.70	6.90	7.56	1310	269	55.4	88.2	4.3	521	605	11.4	0.06	0.26	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.08	< 0.1	< 0.05	< 0.001	< 0.1	0.029	0.9	< 1	0.9	5.9	4.1	7.8
EPA 22A	N	1/17/1990	6,912.90	6.80	6.96	1478	311	57.4	86.7	3.4	556	677	11.7	0.07	0.25	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.09	< 0.1	< 0.05	0.001	< 0.1	0.028	0.2	1.9	2.1	3.1	< 1	3.5
EPA 22A	N	4/19/1990	6,911.90	6.90	7.31	1448	310	63.1	82.9	3.2	576	845	11.5	0.06	0.21	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.09	< 0.1	< 0.05	0.001	< 0.1	0.027	0.5	< 1	0.5	< 0.2	< 1	< 1
EPA 22A	N	7/17/1990	6,910.80	6.90	7.28	1505	317	59.5	80.4	3.6	583	681	11.6	< 0.05	0.12	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	< 0.001	< 0.1	0.0359	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 22A	N	10/16/1990	6,910.00	6.80	7.79	1536	301	59.9	81.2	3.4	547	704	10.9	< 0.05	0.2	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.03	< 0.05	0.11	< 0.1	< 0.05	< 0.001	< 0.1	0.0254	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 22A	N	1/10/1991	6,909.50	6.90	7.98	1551	324	69.2	84.7	7.1	533	754	16.7	< 0.05	0.21	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.01	< 0.05	0.1	< 0.1	< 0.05	< 0.001	< 0.1	0.0241	0.7	< 1	0.7	< 0.2	1.7	1.1
EPA 22A	N	4/16/1991	6,908.80	6.80	7.66	1494	299	60.9	80	3.7	521	720	10.2	< 0.05	0.21	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.12	< 0.1	< 0.05	< 0.001	< 0.1	0.021	< 0.2	1.7	1.7	< 0.2	< 1	< 1
EPA 22A	N	7/9/1991	6,908.30	6.80	7.42	1532	291	54.1	75	3.1	540	663	11.5	0.17	0.09	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.01	< 0.05	0.1	< 0.1	< 0.05	< 0.001	< 0.1	0.0338	0.6	< 1	0.6	< 0.2	< 1	< 1
EPA 22A	N	10/22/1991	6,907.70	6.80	7.24	1430	282	55.3	84.1	3	549	685	16.2	0.16	< 0.01	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.1	< 0.1	< 0.05	< 0.001	< 0.1	0.013	0.3	< 1	0.3	< 0.2	< 1	< 1
EPA 22A	N	1/23/1992	6,906.90	6.80	7.76	1416	308	52.3	82.2	3.3	540	676	11.4	< 0.05	< 0.01	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.11	< 0.1	< 0.05	0.001	< 0.1	0.036	2	2.3	4.3	< 0.2	3.4	2
EPA 22A	N	4/2/1992	6,906.30	6.80	7.70	1453	294	61.2	95.8	3.4	556	727	11	< 0.05	< 0.1	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.11	< 0.1	< 0.05	< 0.001	< 0.1	0.01	0.3	1.5	1.8	< 0.2	< 1	< 1
EPA 22A	N	7/16/1992	6,905.20	6.90	7.43	1456	268	58.6	74.3	3.6	538	714	12.2	< 0.05	0.7	< 1	< 0.1	0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.11	< 0.1	< 0.05	0.001	< 0.1	0.028	0.5	1.4	1.9	< 0.2	< 1	< 1
EPA 22A	N	10/15/1992	6,904.50	6.90	7.51	1603	306	59.6	83.9	2.9	548	744	11.4	< 0.05	< 0.1	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.11	< 0.1	< 0.05	< 0.001	< 0.1	0.009	0.9	2.8	3.7	< 0.2	2.2	< 1
EPA 22A	N	1/13/1993	6,903.90	7.00	7.47	1497	314	60	81	3.3	545	746	15.9	< 0.05	< 0.1	< 1	< 0.1	< 0.001	< 0.1	< 0.01	< 0.01	< 0.05	0.11	< 0.1	< 0.05	< 0.001	< 0.1	0.041	< 0.2	2.6	2.6	< 0.2	< 1	< 1
EPA 22A	N	4/15/1993	6,903.20	7.00	7.52	1631	341	54.4	88.4	1.9	548	777	12.5	< 0.05	0.6	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.02	< 0.05	0.12	< 0.1	< 0.05	< 0.001	< 0.1	0.039	1	< 1	1	< 0.2	< 1	1.5
EPA 22A	N	7/21/1993	6,902.30	7.00	7.83	1635	333	62	98	4.3	558	859	11.8	< 0.05	0.33	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.01	< 0.05	0.11	< 0.1	< 0.05	< 0.001	< 0.1	0.039	0.6	< 1	0.6	< 0.2	1.6	< 1
EPA 22A	N	10/12/1993	6,899.70	7.00	7.40	1699	352	63.3	92.5	2.1	551	847	11.2	< 0.05	0.33	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.12	< 0.1	< 0.05	< 0.001	< 0.1	0.045	0.6	< 1	0.6	< 0.2	2	< 1
EPA 22A	N	1/11/1994	6,900.90	7.00	7.92	1748	343	68.9	72.9	1.7	492	938	11.4	0.12	0.91	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.13	< 0.1	< 0.05	< 0.001	< 0.1	0.045	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 22A	N	4/19/1994	6,900.40	6.70	7.77	1595	315	61.7	82.8	2.8	483	815	11.8	< 0.05	0.68	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.12	< 0.1	< 0.05	< 0.001	< 0.1	0.034	0.5	1.4	1.9	< 0.2	1.1	2.8
EPA 22A	N	7/27/1994	6,899.80	6.80	7.68	1548	392	58.8	85.1	2	510	877	9.8	< 0.05	0.46	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.1	< 0.1	< 0.05	< 0.001	< 0.1	0.035	4.4	6.1	10.5	< 0.2	< 1	13.7
EPA 22A	N	10/11/1994	6,899.10	6.90	7.71	1611	341	58.9	95.3	2.5	538	829	11	< 0.05	0.99	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.11	< 0.1	< 0.05	< 0.001	< 0.1	0.036	0.8	< 1	0.8	< 0.2	5.4	< 1
EPA 22A	N	1/11/1995	6,898.50	6.90	8.00	1726	352	63	87	3	534	828	12.3	0.12	0.92	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.13	< 0.1	< 0.05	< 0.001	< 0.1	0.051	0.8	2.3	3.1	< 0.2	< 1	4.4
EPA 22A	N	4/11/1995	6,898.10	6.90	7.62	1585	325	66	88	2.5	547	751	10.5	0.06	1.09	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.1	< 0.1	< 0.05	< 0.001	< 0.1	0.031	0.3	1.6	1.9	< 0.2	< 1	2.7
EPA 22A	N	7/11/1995	6,897.50	7.00	7.84	1820	394	85	87	2.6	503	974	14.3	1.97	1.92	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.15	< 0.1	< 0.05	< 0.001	< 0.1	0.042	0.4	< 1	0.4	< 0.2	< 1	1.5
EPA 22A	N	10/10/1995	6,896.90	7.20	8.22	1553	313	63	95	2.6	549	724	12	< 0.05	1.12	< 1	< 0.1	0.003	< 0.01	< 0.01	< 0.01	< 0.05	0.11	< 0.1	< 0.05	< 0.001	< 0.1	0.036	1.3	3.8	5.1	< 0.2	< 1	2.3
EPA 22A	N	1/9/1996	6,896.30	7.30	7.49	1724	329	68	94	2.7	549	824	11.5	< 0.05	1.73	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.1	< 0.1	< 0.05	< 0.001	< 0.1	0.038	0.4	< 1	0.4	0.8	< 1	< 1
EPA 22A	N	4/10/1996	6,895.70	7.20	7.93	1782	350	74.5	83.5	2.5	550	881	12.4	0.06	1.85	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.09	< 0.1	< 0.05	< 0.001	< 0.1	0.048	0.5	2	2.5	< 0.2	< 1	1.4
EPA 22A	N	7/17/1996	6,895.30	7.00	7.52	1815	326	72.4	93.6	2.7	548	816	12.1	0.05	1.29	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.15	< 0.1	< 0.05	< 0.001	< 0.1	0.048	0.7	< 1	0.7	< 0.2	< 1	< 1
EPA 22A	N	10/8/1996	6,894.50	6.90	7.48	2040	401	92	93	3	543	1041	16.7	0.07	1.44	< 1	< 0.1	0.002	< 0.01	< 0.01	< 0.01	< 0.05	0.17	< 0.1	< 0.05	< 0.001	< 0.1	0.051	2.1	< 1	2.1	< 0.2	< 1	2.2
EPA 22A	N	1/28/1997	6,893.70	7.00	7.97	2070	488	104	83	2.83	538	1178	20.4	0.06	4.07	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.15	< 0.1	< 0.05	< 0.001	< 0.1	0.032	1.1	< 1	1.1	< 0.2	< 1	1.2
EPA 22A	N	4/14/1997	6,893.10	6.80	7.95	2050	409	94	91.6	2.9	537	1074	16.2	0.06	4.27	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.18	< 0.1	< 0.05	< 0.001	< 0.1	0.043	1.5	< 1	1.5	< 0.2	< 1	3.7
EPA 22A	N	7/15/1997	6,892.60	6.90	8.15	1940	351	80.8	91.1	2.7	521	955	17.2	0.05	3.79	< 1	< 0.1	0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.27	< 0.1	< 0.05	0.003	< 0.1	0.032	0.8	< 1	0.8	< 0.2	< 1	< 1
EPA 23	N	7/28/1989	6,897.30	6.60	6.37	4967	742	422	185	10.7	1037	2390	96.4	0.68	97	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.01	< 0.05	1.8	< 0.1	< 0.05	0.001	< 0.1	0.0443	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	10/8/1989	6,896.70	6.30	7.10	4930	682	397	173	14.1	1086	2339	91	0.53	91	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	1.9	< 0.1	< 0.05	0.001	< 0.1	0.04	0.2	< 1	0.2	9.8	< 1	10.2
EPA 23	N	1/17/1990	6,896.30	6.40	6.66	4882	669	391	174	10.9	1074	2278	90.9	0.53	89	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	1.9	< 0.1	< 0.05	< 0.001	< 0.1	0.035	0.7	1.5	2.2	1.3	1.5	1.5
EPA 23	N	4/18/1990	6,895.60	6.50	6.88	4988	610	363	165	9.9	1104	2241	89.9	0.64	80	< 1	< 0.1	0.002	< 0.05	< 0.01	< 0.01	< 0.05	1.6	< 0.1	< 0.05	< 0.016	< 0.1	0.031	0.4	< 1	0.4	< 0.2	< 1	< 1
EPA 23	N	7/13/1990	6,894.70	6.60	6.86	4780	678	413	173	11.2	1106	2243	89.7	0.31	82.9	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.01	< 0.05	2.11	< 0.1	< 0.05	< 0.001	< 0.1	0.0388	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	10/11/1990	6,894.50	6.50	7.03	4580	657	403	173	10.8	1076	2374	99	0.5	80.1	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	2.07	< 0.1	< 0.05	< 0.001	< 0.1	0.0378	0.9	< 1	0.9	< 0.2	< 1	< 1
EPA 23	N	1/9/1991	6,893.90	6.50	7.10	4876	688	418	177	27	1070	2406	97.5	0.51	95	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	2.01	< 0.1	< 0.05	0.001	< 0.1	0.0491	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	4/16/1991	6,893.60	6.40	7.90	4876	604	387	165	11.1	1059	2408	90	0.43	115	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	2.08	< 0.1	< 0.05	< 0.001	< 0.1	0.023	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	7/9/1991	6,892.90	6.30	6.81	5029	616	393	163	9	1122	2347	93.7	0.56	81.8	< 1	0.17	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.95	< 0.1	< 0.05	< 0.001	< 0.1	0.0436	0.4	< 1	0.4	< 0.2	< 1	< 1
EPA 23	N	10/23/1991	6,892.40	6.30	7.17	4870	626	393	173	10.2	1059	2257	101	0.8	67.5	< 1	0.14	< 0.001	< 0.01	< 0.01	< 0.01	no data	2.18	< 0.1	< 0.05	< 0.001	< 0.1	0.051	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	1/16/1992	6,891.70	6.40	7.42	4916	619	382	168	9.8	979	2376	100	1	94.3	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	2.28	< 0.1	< 0.05	< 0.001	< 0.1	0.032	0.3	< 1	0.3	< 0.2	< 1	< 1
EPA 23	N	4/2/1992	6,891.50	6.30	7.27	4901	669	360	211	12	1096	2408	89.3	0.73	94.3	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	2.27	< 0.1	< 0.05	0.013	< 0.1	0.031	< 0.2	3.6	3.6	< 0.2	< 1	< 1

TABLE A.1
Southwest Alluvium Data Summary, 1989-2019
United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
EPA 23	N	7/16/1992	6,890.20	6.50	7.08	5173	682	349	201	11.4	1093	2390	93.4	0.4	74.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	2.23	< 0.1	< 0.05	0.001	< 0.1	0.032	1.2	3.1	4.3	< 0.2	< 1	1.3
EPA 23	N	10/15/1992	6,889.30	6.60	7.11	4866	655	339	170	11.5	1091	2373	88.2	0.7	48.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	2.69	< 0.1	< 0.05	< 0.001	< 0.1	0.038	1.6	1.4	3	< 0.2	1.1	1.8
EPA 23	N	1/14/1993	6,889.20	6.60	7.30	4647	622	358	155	11.1	1054	2404	78.6	1.2	39.5	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	2.68	< 0.1	< 0.05	< 0.001	< 0.1	0.035	< 0.2	1.8	1.8	< 0.2	< 1	< 1
EPA 23	N	4/15/1993	6,888.90	6.70	7.08	4777	669	349	176	8.8	1094	2361	93.1	0.75	56.6	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	2.61	< 0.1	< 0.05	< 0.001	< 0.1	0.028	0.3	< 1	0.3	< 0.2	< 1	< 1
EPA 23	N	7/21/1993	6,887.50	6.70	7.48	4450	671	347	180	11	1137	2207	87.8	0.93	53	< 1	< 0.1	< 0.001	< 0.01	0.02	0.02	< 0.05	2.89	< 0.1	< 0.05	< 0.001	< 0.1	0.036	0.2	< 1	0.2	< 0.2	< 1	< 1
EPA 23	N	10/11/1993	6,885.70	6.70	7.06	4749	753	372	155	9	1059	2225	79.6	0.91	52.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	2.74	< 0.1	< 0.05	0.001	< 0.1	0.028	< 0.2	1.4	1.4	< 0.2	< 1	< 1
EPA 23	N	1/10/1994	6,886.70	6.60	7.42	4712	681	346	179	8.4	1007	2547	85.2	0.9	41.5	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	2.95	< 0.1	< 0.05	< 0.001	< 0.1	0.035	< 0.2	3.7	3.7	< 0.2	< 1	6.7
EPA 23	N	4/19/1994	6,886.60	6.40	7.63	4823	632	342	160	10.1	997	2460	84.9	1.07	49.5	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	2.63	< 0.1	< 0.05	< 0.001	< 0.1	0.039	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	7/27/1994	6,886.00	6.50	7.40	4720	748	344	144	9.7	1061	2369	88.4	0.8	52.1	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	2.75	< 0.1	< 0.05	0.001	< 0.1	0.032	1.5	2.5	4	< 0.2	< 1	5.4
EPA 23	N	10/10/1994	6,885.40	6.70	7.45	4891	701	404	174	10	1175	2599	92.2	1.2	54.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	2.82	< 0.1	< 0.05	< 0.001	< 0.1	0.036	0.3	< 1	0.3	< 0.2	1.9	< 1
EPA 23	N	1/11/1995	6,885.30	6.60	7.21	4852	690	352	156	10.4	1142	2333	96.7	1.41	56.3	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	2.75	< 0.1	< 0.05	< 0.001	< 0.1	0.046	0.3	2.8	3.1	< 0.2	1.9	4.5
EPA 23	N	4/11/1995	6,885.00	6.50	7.21	4914	710	388	162	9.7	1152	2414	108	1.64	53.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	3	< 0.1	< 0.05	< 0.001	< 0.1	0.034	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	7/10/1995	6,884.10	6.60	7.50	4865	695	401	176	10.3	1227	2303	113	2.28	61.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	3.03	< 0.1	< 0.05	0.002	< 0.1	0.038	0.3	< 1	0.3	< 0.2	< 1	3.3
EPA 23	N	10/9/1995	6,883.80	6.50	7.66	4379	675	380	155	9.4	1122	2194	83.3	1.31	32.7	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	3.52	< 0.1	< 0.05	0.004	< 0.1	0.033	0.6	3	3.6	< 0.2	< 1	< 1
EPA 23	N	1/8/1996	6,883.30	6.40	7.35	4421	690	390	162	10.1	1114	2267	86	1.39	42.5	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	3.4	< 0.1	< 0.05	0.003	< 0.1	0.037	0.2	< 1	0.2	< 0.2	1.9	< 1
EPA 23	N	4/9/1996	6,883.10	6.70	7.67	4880	725	411	150	9.7	1172	2440	95.3	1.51	45	< 1	< 0.1	0.002	< 0.01	< 0.01	< 0.01	< 0.05	3.29	< 0.1	< 0.05	< 0.001	< 0.1	0.04	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	7/17/1996	6,882.50	6.50	7.07	4518	620	350	135	10	1048	2368	68	1.09	8.94	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	4.2	< 0.1	< 0.05	< 0.001	< 0.1	0.025	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	10/8/1996	6,882.30	6.50	7.18	4670	658	378	150	10.1	1094	2269	81.1	1.04	25.8	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	3.65	< 0.1	< 0.05	< 0.001	< 0.1	0.031	0.3	< 1	0.3	< 0.2	< 1	< 1
EPA 23	N	1/27/1997	6,881.80	6.60	7.83	4720	650	370	152	10.3	1138	2403	99	1.19	32.9	< 1	< 0.1	0.003	< 0.01	< 0.01	< 0.01	< 0.05	3.41	< 0.1	< 0.05	0.005	< 0.1	0.026	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	4/14/1997	6,883.20	6.50	7.71	4980	733	431	164	10.4	1210	2351	116	1.88	34.5	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	3.39	< 0.1	< 0.05	0.005	< 0.1	0.035	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	7/14/1997	6,881.10	6.50	7.56	4810	699	400	145	10	1130	2190	99	1.39	33.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	3.45	< 0.1	< 0.05	0.001	< 0.1	0.033	0.5	< 1	0.5	< 0.2	< 1	< 1
EPA 23	N	10/14/1997	6,880.40	6.50	7.71	4840	728	427	175	10.4	1180	2450	113	1.7	40	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	3.69	< 0.1	< 0.05	0.003	< 0.1	0.039	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	1/19/1998	6,881.10	6.60	7.64	4490	647	369	134	10.5	1050	2730	71.4	1.41	1.93	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	4.63	< 0.1	< 0.05	< 0.001	< 0.1	0.024	0.8	< 1	0.8	< 0.2	< 1	< 1
EPA 23	N	4/13/1998	6,880.40	6.70	7.37	4840	711	416	167	10.7	1180	2250	90.8	2.05	49.3	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	3.53	< 0.1	< 0.05	< 0.001	< 0.1	0.0405	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	7/13/1998	6,880.10	6.70	7.73	5060	710	424	170	10.7	1190	2200	98.9	2.32	46	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	3.69	< 0.1	< 0.05	< 0.001	< 0.1	0.0448	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	10/13/1998	6,880.40	6.63	7.95	4620	668	390	151	10.5	1110	2300	78.2	3.05	59.2	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.83	< 0.1	< 0.05	< 0.001	< 0.1	0.0288	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	1/12/1999	6,880.10	6.70	7.72	4740	653	374	142	9.7	1180	2100	95.6	2.45	61.6	< 1	< 0.1	< 0.001	< 0.01	0.005	< 0.01	< 0.05	2.75	< 0.1	< 0.05	< 0.001	< 0.1	0.0443	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	4/13/1999	6,880.00	6.60	7.68	4670	684	375	145	9.6	1140	2290	92.2	2.09	29.2	< 1	< 0.1	< 0.001	< 0.01	0.005	< 0.01	< 0.05	2.96	< 0.1	< 0.05	< 0.001	< 0.1	0.0313	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	7/20/1999	6,879.91	6.70	7.67	4640	690	402	134	12	1120	2300	86	2.65	56.5	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.33	< 0.1	< 0.05	< 0.001	< 0.1	0.0286	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	10/12/1999	6,880.10	6.62	7.69	4910	687	424	152	10.2	1240	2270	111	3.61	63.4	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	3.23	< 0.1	< 0.05	< 0.001	< 0.1	0.0452	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	1/11/2000	6,879.60	6.60	7.73	4730	624	379	144	11.2	1190	1840	92.6	3.11	60.5	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	3.17	< 0.1	< 0.05	0.001	< 0.1	0.0388	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	5/9/2000	6,879.20	6.60	7.81	4380	598	364	125	9.8	1040	2130	68.7	0.96	1.41	< 1	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	7.09	< 0.1	< 0.05	< 0.001	< 0.1	0.0254	< 0.2	2.1	2.1	< 0.2	5.4	< 1
EPA 23	Dup	5/9/2000	no data	6.50	7.81	4430	600	365	125	9.6	1050	2150	70	0.99	1.38	< 1	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	6.96	< 0.1	< 0.05	< 0.001	< 0.1	0.0255	< 0.2	1.6	1.6	< 0.2	5	< 1
EPA 23	N	7/17/2000	6,878.80	6.55	7.66	4450	630	376	117	9.68	1060	1980	71.1	1.02	1.51	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	4.76	< 0.1	< 0.05	< 0.001	< 0.1	0.0231	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	Dup	7/17/2000	no data	6.56	7.55	4450	630	377	120	9.64	1050	2030	68.9	1.03	1.54	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	8.91	< 0.05	4.61	< 0.1	< 0.05	< 0.001	< 0.1	0.0246	< 0.2	0.0246	< 1	< 0.2	< 1
EPA 23	N	10/9/2000	6,878.60	6.54	7.45	4390	531	325	112	10.6	1060	1770	57.4	0.96	1.03	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	4.03	< 0.1	< 0.05	< 0.001	< 0.1	0.025	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	Dup	10/9/2000	no data	6.55	7.55	4380	528	325	111	10.4	1050	1740	56.1	0.92	1.01	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	0.05	4	< 0.1	< 0.05	< 0.001	< 0.1	0.025	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	1/9/2001	6,878.70	6.75	7.68	4340	648	391	114	9.2	1050	2150	67.7	0.97	1.14	< 1	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	4.77	< 0.1	< 0.05	0.001	< 0.1	0.024	< 0.2	2.3	2.3	< 0.2	< 1	< 1
EPA 23	Dup	1/9/2001	no data	6.76	7.63	4370	650	392	119	9.3	1060	2380	69.7	1.05	1.14	< 1	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	4.65	< 0.1	< 0.05	< 0.001	< 0.1	0.024	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	2/6/2001	6,878.60	6.80	7.56	4380	737	429	118	10.6	1060	2510	68.5	1.08	1.25	< 1	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	4.77	< 0.1	< 0.05	< 0.001	< 0.1	0.025	0.3	2.2	2.5	< 0.2	< 1	< 1
EPA 23	Dup	2/6/2001	no data	6.68	7.56	4380	729	424	111	10.5	1060	2500	67.1	1.08	1.3	< 1	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	4.85	< 0.1	< 0.05	< 0.001	< 0.1	0.025	0.3	2.3	2.6	< 0.2	< 1	< 1
EPA 23	N	3/6/2001	6,878.50	6.93	7.61	4070	636	389	150	10.2	1030	2410	65.6	1.09	1.25	< 1	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	5	< 0.1	< 0.05	< 0.001	< 0.1	0.0245	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	Dup	3/6/2001	no data	7.08	7.78	4110	637	389	150	10.1	1030	2420	64.7	1.12	1.2	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	5.03	< 0.1	0.07	< 0.001	< 0.1	0.0252	0.4	< 1	0.4	< 0.2	< 1	< 1
EPA 23	N	4/4/2001	6,878.50	6.87	7.49	4400	702	410	118	9.3	1040	2310	71	1.16	1.41	< 1	< 0.1	0.001	< 0.01	< 0.005	< 0.01	< 0.05	4.29	< 0.1	< 0.05	< 0.001	< 0.1	0.024	0.3	< 1	0.3	< 0.2	< 1	< 1
EPA 23	Dup	4/4/2001	no data	6.87	7.51	4410	711	414	114	9.2	1040	2350	73.9	1.2	1.42	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	4.19	< 0.1	< 0.05	< 0.001	< 0.1	0.023	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	5/7/2001	6,878.40	6.97	7.14	4460	622	371	113	10	1040	2070	78.6	1.28	1.25	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	5.74	< 0.1	< 0.05	< 0.001	< 0.1	0.026	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	Dup	5/7/2001	no data	6.88	7.21	4450	620	371	109	10	1030	2060	79.4	1.21	1.27	< 1	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	5.75	< 0.1	< 0.05	< 0.001	< 0.1	0.025	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	6/4/2001	6,878.80	6.67	7.22	4360	618	371	107	9.5	1040	2210	75.4	1.29	1.67	< 1	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	5.11	< 0.1	< 0.05	< 0.001	< 0.1	0.025	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	Dup	6/4/2001	no data	6.67	7.24	4020	617	372	102	9.8	1020	2240	76.2	1.33	1.6	< 1	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	5.15	< 0.1	< 0.05	< 0.001	< 0.1	0.024	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	7/9/2001	6,878.40	6.60	7.12	4470	684	418	116	9.7	1060	2250	86	1.07	1.36	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	5.1	< 0.1	< 0.05	< 0.001	< 0.1	0.0276	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	Dup	7/9/2001	no data	6.59	7.05	4480	682	418	113	9.6	1070	2240	90	1.12	1.51	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	5.19	< 0.1	< 0.05	< 0.001	< 0.1	0.0263	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	8/6/2001	6,878.25	6.58	7.20	4500	640	390	110	10	1060	2300	86	1.1	1.28	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	5.4	< 0.1	< 0.05	< 0.001	< 0.1	0.025	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	Dup	8/6/2001	no data	6.59	7.20	4480	630	390	110	10	1060	2100	91	1.1	1.29	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	5.5	< 0.1	< 0.05	< 0.001	< 0.1	0.027	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	9/10/2001	6,878.49	6.56	7.50	4490	650	390	122	9.9	1100	2200	75.6	1.02	1.2	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	4.68	< 0.1	< 0.05	< 0.001	< 0.1	0.0229	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	Dup	9/10/2001	no data	6.56	7.50	4460	650	390	118	10	1100	2200	76.2	1.03	1.2	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	4.96	< 0.1	< 0.05	< 0.001	< 0.1	0.0245	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	10/1/2001	6,878.40	6.68	7.30	4500	600	370	115	10.4	1080	2100	87.9	1.15	1	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	4.38	< 0.1	< 0.05	< 0.001	< 0.1	0.0239	0.5	< 1	0.5	< 0.2	< 1	< 1
EPA 23	Dup	10/1/2001	no data	6.67	7.40	4510	610	370	113	10.6	1090	2200	97.7	1.06	1	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	4.39	< 0.1	< 0.05	< 0.001	< 0.1	0.0235	0.2	< 1	0.2	< 0.2	< 1	< 1
EPA 23	N	11/5/2001	6,878.50	6.74	7.60	4540	670	401	123	10.8	1050	2360	87	0.95	1.2	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	4.79	< 0.1	< 0.05	< 0.001	< 0.1	0.0212	0.6	3.8	4.4	< 0.2	< 1	< 1
EPA 23	Dup	11/5/2001	no data	6.71	7.60	4540	664	397	117	10.8	1050	2320	95	0.94	1.1	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	4.74	< 0.1	< 0.05	< 0.001	< 0.1	0.0223	0.5	1.7	2.2	< 0.2	< 1	< 1

TABLE A.1

Southwest Alluvium Data Summary, 1989-2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
EPA 23	N	12/3/2001	6,878.50	6.68	7.60	4480	615	365	107	9.7	1070	2020	83.6	1.06	3.6	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	4.48	< 0.1	< 0.05	0.003	< 0.1	0.0243	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	1/7/2002	6,878.20	6.70	7.10	4500	715	403	101	10.7	1070	2430	94.4	1.01	1.02	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	4.59	< 0.1	< 0.05	< 0.001	< 0.1	0.0211	0.5	< 1	0.5	< 0.2	< 1	< 1
EPA 23	N	2/4/2002	6,878.15	6.80	7.30	4470	711	396	124	10.6	1060	2350	88.2	1.18	0.95	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	4.69	< 0.1	< 0.05	< 0.001	< 0.1	0.0164	0.4	< 1	0.4	< 0.2	< 1	< 1
EPA 23	N	3/4/2002	6,878.05	6.73	7.20	4430	650	383	132	10.3	1080	2340	82.7	1.07	1.16	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	5.48	< 0.1	< 0.05	< 0.001	< 0.1	0.0259	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	4/1/2002	6,878.20	6.57	7.83	4490	681	389	127	11.2	1070	2400	83	1.09	1.14	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	5.12	< 0.1	< 0.05	< 0.001	< 0.1	0.029	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	5/6/2002	6,878.16	6.62	7.17	4500	661	380	127	11	1080	2240	77.7	1.11	1.09	< 1	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	5.41	< 0.1	< 0.05	< 0.001	< 0.1	0.0252	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	6/3/2002	6,878.22	6.61	7.37	4480	664	382	117	9.4	1060	2270	73.5	1.12	1.05	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	5.43	< 0.1	< 0.05	< 0.001	< 0.1	0.0262	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	7/8/2002	6,877.87	6.62	7.55	4520	656	395	119	10.2	1070	2320	78.2	1.34	0.91	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	4.62	0.1	< 0.05	< 0.001	< 0.1	0.0291	0.6	< 1	0.6	< 0.2	< 1	< 1
EPA 23	N	10/8/2002	6,877.85	5.92	7.59	4280	628	372	118	9.5	1080	2010	75.6	1.47	0.98	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	4.67	< 0.1	< 0.05	< 0.001	< 0.1	0.0197	0.8	< 1	0.8	< 0.2	< 1	< 1
EPA 23	N	1/6/2003	6,877.27	6.80	7.23	4510	602	369	116	10.3	1060	2180	83.4	1.5	0.9	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	5.04	< 0.1	< 0.05	< 0.001	< 0.1	0.024	< 0.2	< 1	0	< 0.2	< 1	< 1.0
EPA 23	N	4/7/2003	6,877.26	6.65	7.31	4490	635	365	122	13.4	1080	2100	86.2	1.2	1.3	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	4.8	< 0.1	< 0.05	< 0.001	< 0.1	0.0232	< 0.2	< 1	0	< 0.2	< 1	< 1.0
EPA 23	N	7/7/2003	6,877.11	6.42	7.61	4660	623	360	119	11	1070	2160	71.9	1.37	0.9	< 1	< 0.1	< 0.001	< 0.01	< 0.005	0.02	< 0.05	5.28	< 0.1	< 0.05	< 0.001	< 0.1	0.0248	< 0.2	< 1	0	< 0.2	< 1	< 1.0
EPA 23	N	10/6/2003	6,876.91	6.46	7.41	4550	693	416	137	10.3	1090	2500	73.6	1.57	0.6	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	5.58	< 0.1	< 0.05	< 0.001	< 0.1	0.0302	< 0.2	< 1	0	< 0.2	< 1	< 1.0
EPA 23	N	1/5/2004	6,876.67	6.67	7.38	4500	688	412	120	10.2	1090	2420	93.9	1.25	0.62	< 1.0	0.3	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	5.88	< 0.1	< 0.05	< 0.001	< 0.1	0.0247 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
EPA 23	N	4/5/2004	6,876.75	7.00	6.87	4540	641	387	131	10.6	1110	2280 D	81.3	1.52	0.69	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	5.09	< 0.1	< 0.05	< 0.001	< 0.1	0.0252 D	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	7/12/2004	6,876.27	6.41	6.97	4610	665	388	142	10.7	1110	2290 D	82	1.29	0.55	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	4.84	< 0.1	< 0.05	< 0.001	< 0.1	0.0244 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
EPA 23	N	10/4/2004	6,876.01	6.12	7.16	4570	670 D	398 D	140	9.9	1080	2380 D	79	1.06	0.4	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	5.03	< 0.1	< 0.05	< 0.001	< 0.1	0.0226 D	0.4	1.3	1.7	< 0.2	< 1.0	< 1.0
EPA 23	N	1/3/2005	6,875.97	6.72	7.12	4590	652 D	381 D	134	10.4	1070	2160 D	79	1.34	1.2	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	4.9	< 0.1	< 0.05	< 0.001	< 0.1	0.0265	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
EPA 23	N	4/4/2005	6,875.94	6.69	7.36	4400	649	380	134	9.8	1120	2250	80	1.09	0.6	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	5.2	< 0.1	< 0.05	< 0.001	< 0.1	0.0246	< 0.2	3.5	3.5	< 0.2	< 1.0	< 1.0
EPA 23	N	7/11/2005	6,875.53	6.60	7.35	4460	707 D	413 D	135	10.2	1050	2440 D	87	1.14	0.2	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	5.12	< 0.1	< 0.05	< 0.001	< 0.1	0.0252	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
EPA 23	N	10/3/2005	6,875.41	6.58	7.21	4480	650 D	408 D	130	10.2	1120	2170 D	85	1.11	0.4	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	5.15	< 0.1	< 0.05	< 0.001	< 0.1	0.0261	< 0.2	1.2	1.2	< 0.2	< 1.0	< 1.0
EPA 23	N	1/9/2006	6,874.95	6.77	7.66	4410	686 D	420 D	131	10.4	1130	2630 D	82	1.33	1.8	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	5.64	< 0.1	< 0.05	< 0.001	< 0.1	0.0246	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
EPA 23	N	4/3/2006	6,874.81	6.61	7.10	4460	639 D	415 D	119	9.9	1110	2250 D	96 D	1.33	0.5	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	5.46	< 0.1	< 0.05	< 0.001	< 0.1	0.0241 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
EPA 23	N	7/17/2006	6,874.56	6.50	6.77	4370	639 D	411 D	146	11	1130	2560 D	88	1.21	1.4	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	5.4	< 0.1	< 0.05	< 0.001	< 0.1	0.0262	0.4	< 1.0	0.4	< 0.2	< 1.0	< 1.0
EPA 23	N	10/2/2006	6,874.41	6.53	6.89	4740	638 D	397 D	141	11	1180	2260 D	79	3.54	10.8 D	< 0.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	5.14	< 0.1	< 0.05	< 0.001	< 0.1	0.0265	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	1/8/2007	6,874.03	6.67	6.91	4090	576 D	355 D	121	9.6	1140	2050 D	80	2.38	6	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	4.8	<0.1	<0.05	<0.001	<0.1	0.0229	<0.2	<1	0	<0.2	<1	<1
EPA 23	N	4/9/2007	6,874.31	6.68	6.88	4320	636 D	380 D	125	10.6	1120	2220 D	86	1.2	1.5	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	5.25	<0.1	<0.05	<0.001	<0.1	0.0339	<0.2	<1	0	<0.2	<1	<1
EPA 23	N	7/9/2007	6,873.91	6.54	6.94	4630	661 D	417 D	146	10.7	1200	2430 D	84	1.99	7.7	<0.5	<0.1	0.01	<0.01	<0.005	<0.01	<0.05	4.59	<0.1	<0.05	<0.001	<0.1	0.027	<0.2	<1	0	<0.2	<1	<1
EPA 23	N	10/1/2007	6,873.59	6.56	6.76	4850	608 D	424 D	162 D	12.5	1300	2350 D	108 D	5.8 D	22.7	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	4.67	<0.1	<0.05	<0.001	<0.1	0.0342	<0.2	<1	0	<0.2	<1	<1
EPA 23	N	1/14/2008	6,873.21	6.77	6.62	4910	622 D	404 D	154 D	12.3	1230	2200 D	123 D	5.67	21.2 D	< 0.5	< 0.1	0.001	< 0.01	< 0.005	< 0.01	< 0.05	4.29	< 0.1	< 0.05	0.001	< 0.1	0.0316	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 23	N	4/7/2008	6,873.51	6.56	6.84	4300	683 D	429 D	162 D	11.2 D	1100	2430 D	89	0.29	4.1	< 0.50	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	5.04	< 0.1	< 0.05	< 0.001	< 0.1	0.0303	0.1 U	0.3 U	0.4	0.4	0 U	1
EPA 23	N	7/7/2008	6,873.21	6.38	6.79 H	4440 H	619	390	137 D	10	1230	2410 D	94	1.88	13.1	< 0.5	< 0.1	< 0.003	< 0.01	< 0.005	< 0.01	< 0.05	5.2	< 0.1	< 0.05	< 0.001	< 0.1	0.0287	0.09 U	0.94 U	1.03	0 U	2.4 U	0.9
EPA 23	N	10/6/2008	6,872.96	6.49	6.97	4530	656	391	147 D	10	1170	2450 D	85	2.8	22.3	< 0.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	4.54	< 0.1	< 0.05	< 0.001	< 0.1	0.0336	0.02 U	-0.004 U	0.016	0.4	-0.1 U	1.3
EPA 23	N	1/20/2009	6,872.46	6.52	7.03	5160	649	449	198	12	1290	2140 D	120	3.09	76.2 D	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	3.15	<0.1	<0.05	0.001	<0.1	0.0435	0.17 U	1.6	1.77	-0.5 U	-0.4 U	1.2
EPA 23	N	4/6/2009	6,872.21	6.58	6.64	4730	621 D	424 D	170 D	11	1270	2440 D	95	2.17	14.8	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	4.58	<0.1	<0.05	0.002	<0.1	0.0375	0.36	-0.3 U	0.06	-0.02 U	-1 U	0.3 U
EPA 23	N	7/6/2009	6,872.21	6.39	6.76	4870	680 D	430	167 D	12	1240	2560 D	95	4.65	27.8 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	4.31	<0.1	<0.05	<0.001	<0.1	0.0306	0.47	0.76 U	1.23	0.2 U	-0.2 U	0.6
EPA 23	N	10/5/2009	6,872.21	6.58	7.22	4610	616	384	138	10	1220	2220 D	98	2.04	7.4	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	5.05	<0.1	<0.05	<0.001	<0.1	0.0309	0.42	1.2 U	1.62	0.04 U	0.7 U	0.5 U
EPA 23	N	1/4/2010	6,871.56	6.60	6.84	5200 D	669 D	432	180	12	1370	2530 D	113	6.1 D	40 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	4.02	<0.1	<0.05	0.002	<0.1	0.0357	0.26	1.1 U	1.36	0.03 U	-2 U	0.1 U
EPA 23	N	4/5/2010	6,871.66	6.65	6.72	4690 DH	733	457	183	12	1310	2410 D	94	1.88	8.6 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	4.8	<0.1	<0.05	0.004	<0.1	0.0327	0.18	1.1 U	1.28	-0.02 U	0.7 U	0.5 U
EPA 23	N	7/12/2010	6,871.31	6.46	6.96	4800 D	674	402	150	11	1300	2430 D	97 D	2.5 D	10.8 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	5.28	<0.1	<0.05	<0.001	<0.1	0.0348	0.38	0.71 U	1.09	0.03 U	-0.6 U	-0.01 U
EPA 23	N	10/4/2010	6,871.11	6.82	7.63	4880 D	642	386	157	11	1330	2380 D	93 D	3.48	16 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	4.98	<0.1	<0.05	0.001	<0.1	0.0328	0.21	1.1 U	1.31	0.06 U	0.5 U	-0.07 U
EPA 23	N	1/3/2011	6,870.91	6.56	6.85	4330 D	658	381	142	11	1210	2340 D	98 D	1.13	0.9	<0.50	<0.1	<0.001	<0.01	<0.005	0.01	<0.05	5.57	<0.1	<0.05	<0.001	<0.1	0.0345	0.03 U	0.60 U	0.63	0.5	1.3 U	0.4 U
EPA 23	N	4/4/2011	6,870.46	6.76	7.01	4520 D	650	372	146	11	1220	2350 D	96 D	0.71 D	0.3	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	5.19	<0.1	<0.05	<0.001	<0.1	0.0299	0.22	0.16 U	0.38	0.08 U	-0.8 U	0.6
EPA 23	N	7/11/2011	6,870.36	6.44	7.53	4450 D	664	382	150	11	1230	2310 D	95 D	0.76	0.7 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	5.58	<0.1	<0.05	<0.001	<0.1	0.0299	0.18	0.73 U	0.91	-0.01 U	-0.6 U	0.5 U
EPA 23	N	10/3/2011	6,870.16	6.64	7.81	4460 D	668	376	146	11	1150	2410 D	99 D	0.7 D	0.5	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	5.68	<0.1	<0.05	<0.001	<0.1	0.0296	0.15	0.50 U	0.65	0.03 U	0.1 U	0.2 U
EPA 23	N	1/2/2012	6,869.65	6.69	6.86 H	4720 D	646	384	152	12	1160	2350 D	107 D	2.1 D	13 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	5.78	<0.1	<0.05	<0.001	<0.1	0.0305	0.48	-0.05 U	0.48	0.01 U	0.2 U	0.5
EPA 23	N	4/2/2012	6,870.02	6.86	6.66 H	4670 D	658	371	141	11	1200	2340 D	99 D	0.63	0.2	<0.50	<0.1	<0.01	<0.01	<0.005	0.01	<0.05	6.15	<0.1	<0.05	<0.001	<0.1	0.0342	0.24	0.22 U	0.68	-0.004 U	0.1 U	-0.1 U
EPA 23	N	7/9/2012	6,869.36	6.54	6.82 H	4660	658	361	129	9	1210	2280 D	97 D	0.53	0.8	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	5.74	<0.1	<0.05	<0.001	<0.1	0.0267	0.33	0.13 U	0.59	0.05 U	0.5 U	0.06 U
EPA 23	N	10/8/2012	6,869.16	6.68	6.70 H	4540	703	378	145 D	11	1260	2310 D	104 D	0.66	<0.1	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	6.09	<0.1	<0.05	<0.001	<0.1	0.0283	0.18	0.10 U	0.18	0.08 U	0.5 U	0.3 U
EPA 23	N	1/7/2013	6,869.21	6.62	6.69 H	4500	693	398	154 D	11	1240	2430 D	102 D	0.47	1.1	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	5.8	<0.1	<0.05	<0.001	<0.1	0.0288	0.2	1.8	2	0.02 U	0.5 U	0.4 U
EPA 23	N	4/1/2013	6,868.91	6.73	6.82 H	4720	685	398	155	11	1280	2350 D	104 D	0.54	<0.1	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	5.93	<0.1	<0.05	<0.001	<0.1	0.0299	0.17	0.54 U	0.17	0.02 U	-0.1 U	0.5
EPA 23	N	7/8/2013	6,868.55	6.61	6.77 H	4710	647	379	143	10	1270	2380 D	102 D	0.47	0.5	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	6.04	<0.1	<0.05	<0.001	<0.1	0.0323	0.18	0.93 U	0.18	0.01 U	0.8 U	0.4 U
EPA 23	N	9/30/2013	6,868.49	6.67	6.73 H	4640 H	654	387	147	11	1290	2300 D	98 D	0.58	<0.1	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	5.89	<0.1	<0.05	<0.001	<0.1	0.0341	0.25	0.23 U	0.25	0.02 U	-0.09 U	0.002 U
EPA 23	N	1/6/2014	6,868.12	6.89	6.70	4680	621	370	142	10	1270	2300	100	0.51	<0.1	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	6.3	<0.1	<0.05	<0.001	<0.1	0.0314	0.41	1.4 U	0.41	0.03	0.1 U	0.04
EPA 23	N	3/31/2014	6,868.16	6.84	6.66 H	4620	616	358	137	10	1280	2280 D	106 D	0.67	<0.1	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	5.98	<0.1	<0.05	<0.001	<0.1	0.0324	0.25	1.4	1.65	0.0007 U	-0.3 U	0.08 U
EPA 23	N	7/7/2014	no data	no data	6.79 H	4600	655	368	142 D	11	1290	2360 D	102 D	0.6	<0.1	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	5.92	<0.1	<0.05	<0.001	<0.1	0.0274	0.39	0.65 U	0.39	0.03 U	0.6 U	-0.03 U
EPA 23	N	10/6/2014	6,867.68	6.75	6.75 H	4670	669	390	152	11	1300	2330 D	102 D	0.9	<0.1	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	5.77	<0.1	<0.05	<0.001	<0.1	0.0313	0.4	2.7	3.1	0.01 U	0.009 U	0.4 U
EPA 23	N	1/5/2015	6,867.33	6.95	6.79 H	4670	666	386	154	11	1260	2240 D	100 D	0.87	<0.1	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	5.84	<0.1	<0.05	0.002	<0.1	0.0311	0.27	1.8	2.07	0.04 U	0.2 U	-0.3 U
EPA 23	N	4/6/2015	6,867.54	6.69	6.72 H	4640	674	391	153	11	1320	2320 D	120	0.73	<0.1	<0.5	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	5.69	<0.1	<0.05	<0.001	<0.1	0.0321	0.46	0.49 U	0.46	0.01 U	0.4 U	1.1 U

TABLE A.1
Southwest Alluvium Data Summary, 1989-2019
United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
EPA 23	N	7/6/2015	6,867.18	6.63	6.69 H	4630	650	383	149	12	1360	2410 D	113 D	0.69	<0.1	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	5.84	<0.1	<0.05	<0.001	<0.1	0.034	0.39	0.29 U	0.39	0.04 U	-0.2 U	0.7 U
EPA 23	N	10/5/2015	6,867.05	6.78	6.72 H	4670 H	639	374	144	11	1250	2400 D	118 D	0.65	<0.1	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	5.9	<0.1	<0.05	<0.001	<0.1	0.0291	0.36	1.5	1.86	0.05 U	0.3 U	1.4
EPA 23	N	1/4/2016	6,866.79	6.82	6.73 H	4660	673	390	150	11	1340	2440 D	119 D	0.5 D	<0.1	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	5.57	<0.1	<0.05	<0.001	<0.1	0.0292	0.53	1.1 U	0.53	0.01 U	-0.5 U	1.3
EPA 23	N	4/4/2016	6,866.44	6.72	6.79 H	4640	670	386	157	11	1290	2360 D	110 D	0.35	<0.1	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	5.67	<0.1	<0.05	<0.001	<0.1	0.0326	0.41	2.1	2.51	0.03 U	0.2 U	1.8
EPA 23	N	7/11/2016	6,866.49	6.65	6.69 H	4640 D	671	390	151	11	1330	2540 D	125 D	0.4	<0.1	<0.50	<0.1	<0.001	<0.001	<0.005	0.01	<0.001	6.16	<0.1	<0.05	<0.001	<0.1	0.0291	0.56	2.2	2.76	-0.01 U	0.4 U	1.6
EPA 23	N	10/3/2016	6,866.45	6.79	6.67 H	4640 H	660	393	153	11	1300	2460 D	114 D	0.3	<0.1	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	5.84	<0.1	<0.05	<0.001	<0.1	0.0284	0.55	5.5	6.05	0.04 U	0.7 U	0.5 U
EPA 23	N	1/9/2017	6,866.00	6.80	6.69 H	4610 D	647	395	155	11	1340	2450 D	118 D	0.6	0.1 H	<0.50	<0.1	0.002	<0.001	<0.005	<0.01	<0.001	5.75	<0.1	<0.05	<0.001	<0.1	0.0293	0.55	0.44 U	0.55	0.06 U	0.06 U	1.5
EPA 23	N	4/3/2017	6,866.06	6.63	6.68 H	4550 D	661	376	150	11	1300	2500 D	123 D	0.54	0.03	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	6.37	<0.1	<0.05	<0.001	<0.1	0.0387	0.43	0.84 U	0.43	0.02 U	0.4 U	0.2 U
EPA 23	N	7/10/2017	6,865.69	6.72	6.69 H	4590 D	650	379	143 D	10	1320	2240 D	115 D	0.51	<0.01	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	6.85	<0.1	<0.05	<0.001	<0.1	0.0321	0.5	0.9 U	0.5	-0.01 U	1.4	0.5 U
EPA 23	N	10/2/2017	6,865.69	6.68	6.70 H	4490 DH	649	391	151	10	1360	2210 D	117 D	0.46	<0.01	<0.50	<0.1	<0.001	<0.001	<0.005	0.01	<0.001	6.81	<0.1	<0.05	<0.001	<0.1	0.0351	0.3	1.2 U	0	0.1 U	0.8 U	1
EPA 23	N	1/8/2018	6,865.27	6.86	6.71 H	4650 D	649	387	148 D	10	1250	2440 D	120 D	0.8 D	<0.01	<0.50	<0.03	<0.001	<0.001	<0.001	0.01	<0.001	6.93 D	<0.001	<0.005	<0.001	<0.01	0.0348	0.3	-0.03 U	0.3	0.002 U	-0.09 U	0.7
EPA 23	N	4/2/2018	6,865.31	6.72	6.66 H	4710 D	730 D	356	146	10	1280	2450 D	124 D	0.52	0.01	<0.50	<0.03	<0.001	<0.001	<0.001	0.01	<0.001	6.46	<0.001	<0.005	<0.001	<0.01	0.0337	0.6	0.1 U	0.6	0.01 U	1 U	2.2
EPA 23	N	7/9/2018	6,864.76	6.74	6.70 H	4690 D	635	378	159	9	1310	2380 D	125 D	0.22	0.21	<0.50	<0.03	<0.001	<0.001	<0.001	0.007	<0.001	5.52	<0.001	<0.005	<0.001	<0.01	0.0342	0.7	2	2.7	0.009 U	0.5 U	1
EPA 23	N	10/1/2018	6,864.67	6.74	6.68 H	4770 D	675	379	151 D	11	1300	2420 D	123 D	0.38	0.03	<0.50	<0.03	<0.001	<0.001	<0.001	0.01	<0.001	6.17	0.001	<0.005	<0.001	<0.01	0.0313	0.5	1.6 U	0.5	0.04 U	0.8 U	1.3
EPA 23	N	1/7/2019	6,864.54	6.68	6.7 H	4710 D	698	407	168 D	12	1320	2400 D	119 D	0.07	0.47	<0.50	<0.03	no data	<0.001	<0.001	0.007	<0.001	5.11	0.001	<0.005	no data	0.01	0.03	0.5	1.8	2.3	0.002 U	-0.2 U	1.2
EPA 23	N	4/8/2019	6,864.33	6.58	6.65 H	4840 D	699	399	162	12	1350	2410 D	122 D	0.28	2.82	<0.50	<0.03	0.003	<0.001	<0.001	0.007	<0.001	5.78	0.001	0.006	<0.001	0.04	0.0291	0.3	0.2 U	0.5	0.1	0.8 U	1.1
EPA 23	N	7/15/2019	6,864.35	6.63	6.71 H	4900 D	646	389	159	11	1370	2480 D	128 D	0.7	5.1 D	<0.50	<0.03	<0.001	<0.001	<0.001	0.008	<0.001	6.15 D	0.001	<0.005	<0.001	<0.01	0.0327	0.5	3.7	4.2	0.04 U	0.7 U	0.6
EPA 23	N	10/9/2019	6,864.17	6.78	6.79 H	4790 DH	670	402	165	12	1350	2340 D	126	0.17	2.65	<0.50	<0.03	<0.001	<0.001	<0.001	0.007	<0.001	3.9	0.001	<0.005	<0.001	<0.01	0.0333	0.5	0.8 U	1.3	0.007	0.7 U	1
EPA 25	N	7/28/1989	6,861.30	7.00	6.66	3200	659	148	109	7.3	549	1711	29	0.05	37	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.22	< 0.1	< 0.05	0.001	< 0.1	0.0184	0.6	< 1	0.6	< 0.2	1	1.8
EPA 25	N	10/8/1989	6,861.10	6.70	7.54	3200	650	150	107	10	619	1745	31.7	0.05	36	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.22	< 0.1	< 0.05	0.001	< 0.1	0.022	1	< 1	1	< 0.2	1.2	1.1
EPA 25	N	1/17/1990	6,861.50	6.60	6.70	3252	625	147	106	7.8	615	1656	31.7	0.05	30	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.02	< 0.05	0.21	< 0.1	< 0.05	< 0.001	< 0.1	0.019	0.2	2	2.2	0.7	< 1	1
EPA 25	N	4/18/1990	6,861.20	6.70	6.88	3299	640	148	103	7.3	647	1619	34.1	0.05	35	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.02	< 0.05	0.3	< 0.1	< 0.05	0.001	< 0.1	0.019	0.5	< 1	0.5	< 0.2	< 1	1.4
EPA 25	N	7/13/1990	6,860.60	6.70	7.18	3343	642	164	101	8.6	677	1628	34.1	< 0.05	34.4	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.18	< 0.1	< 0.05	< 0.001	< 0.1	0.0194	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	10/10/1990	6,860.70	6.80	7.32	3422	711	155	105	8.1	653	1724	38	< 0.05	35.9	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.01	< 0.05	0.2	< 0.1	< 0.05	< 0.001	< 0.1	0.0206	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	1/9/1991	6,861.00	6.80	7.20	3248	655	152	111	12	667	1624	39.4	< 0.05	43.5	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.01	< 0.05	0.23	< 0.1	< 0.05	< 0.001	< 0.1	0.0277	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	4/16/1991	6,860.80	6.60	7.90	3300	633	150	107	7.6	650	1640	40.2	< 0.05	54.5	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.25	< 0.1	< 0.05	< 0.001	< 0.1	0.017	< 0.2	< 1	0	< 0.2	1.5	< 1
EPA 25	N	7/9/1991	6,860.90	6.40	7.14	3461	607	153	95	6.7	677	1718	39.2	0.15	55	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.22	< 0.1	< 0.05	< 0.001	< 0.1	0.0231	< 0.2	1	1	< 0.2	1.7	< 1
EPA 25	N	10/24/1991	6,859.60	6.50	7.47	3399	639	432	105	7.3	722	1672	62.5	0.31	38	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.01	no data	0.24	< 0.1	< 0.05	< 0.001	< 0.1	0.049	< 0.2	3.5	3.5	< 0.2	< 1	< 1
EPA 25	N	1/24/1992	6,859.30	6.50	7.51	3123	619	153	102	7	691	1669	45.7	0.14	23.5	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.24	< 0.1	< 0.05	0.001	< 0.1	0.027	0.7	< 1	0.7	< 0.2	< 1	< 1
EPA 25	N	4/3/1992	6,859.20	6.40	7.51	3414	564	138	129	8.9	752	1781	45.4	0.22	43.9	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.22	< 0.1	< 0.05	< 0.001	< 0.1	0.039	< 0.2	5.4	5.4	< 0.2	< 1	< 1
EPA 25	N	7/16/1992	6,858.50	6.50	7.48	3076	623	161	156	10.1	740	1804	49.3	0.18	44.9	< 1	< 0.1	0.007	< 0.01	< 0.01	0.02	< 0.05	0.35	< 0.1	< 0.05	0.003	< 0.1	0.041	< 0.2	< 1	0	< 0.2	7	< 1
EPA 25	N	10/15/1992	6,858.10	6.70	7.03	3529	673	147	120	8.8	769	1725	51.6	< 0.05	38.9	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.23	< 0.1	< 0.05	< 0.001	< 0.1	0.022	1.7	1.1	2.8	< 0.2	5.7	1.9
EPA 25	N	1/12/1993	6,857.80	6.70	7.36	3591	725	162	112	9.5	766	1631	52.6	< 0.05	50.7	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.01	< 0.05	0.22	< 0.1	< 0.05	0.01	< 0.1	0.018	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	4/15/1993	6,857.70	6.70	7.65	3674	793	151	123	6.4	1049	1818	59.4	0.06	41.1	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.02	< 0.05	0.23	< 0.1	< 0.05	< 0.001	< 0.1	0.025	0.2	< 1	0.2	< 0.2	1.9	< 1
EPA 25	N	7/20/1993	6,857.00	6.70	7.52	3503	696	151	127	7.1	817	1709	62.7	0.07	38.7	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.03	< 0.05	0.24	< 0.1	< 0.05	< 0.001	< 0.1	0.025	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	10/11/1993	6,855.10	6.80	7.26	3584	707	152	95	6.5	805	1699	59.3	0.05	40.8	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.21	< 0.1	< 0.05	< 0.001	< 0.1	0.023	< 0.2	< 1	0	< 0.2	3.5	< 1
EPA 25	N	1/10/1994	6,856.60	6.80	7.59	3639	662	163	99	6.3	790	1771	67.8	0.12	38.6	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.29	< 0.1	< 0.05	< 0.001	< 0.1	0.062	< 0.2	2.8	2.8	< 0.2	5.2	5.2
EPA 25	N	4/20/1994	6,856.30	6.80	7.07	3486	647	151	112	6.5	791	1672	67	0.18	47.1	< 1	< 0.1	0.002	< 0.01	< 0.01	< 0.01	< 0.05	0.21	< 0.1	< 0.05	< 0.001	< 0.1	0.04	1.7	< 1	1.7	< 0.2	< 1	1.9
EPA 25	N	7/26/1994	6,855.80	6.70	7.60	3663	783	181	115	7.4	822	1681	70.4	< 0.05	54.7	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.26	< 0.1	< 0.05	< 0.001	< 0.1	0.052	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	10/10/1994	6,855.70	6.70	7.60	3704	764	187	129	7.8	907	1909	73.9	0.13	47.1	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.25	< 0.1	< 0.05	< 0.001	< 0.1	0.046	0.3	< 1	0.3	< 0.2	< 1	< 1
EPA 25	N	1/10/1995	6,855.40	6.80	7.50	3734	840	137	120	8.4	889	1779	78.7	0.13	47.1	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.29	< 0.1	< 0.05	< 0.001	< 0.1	0.051	< 0.2	< 1	0	< 0.2	4.3	< 1
EPA 25	N	4/11/1995	6,855.20	6.10	7.35	3686	806	200	136	13.7	915	1849	91	0.34	50.1	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.46	< 0.1	< 0.05	< 0.001	< 0.1	0.052	2.1	< 1	2.1	< 0.2	< 1	2
EPA 25	N	7/10/1995	6,855.20	6.90	7.53	3576	715	198	133	7.6	697	1716	88	0.26	58.9	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.37	< 0.1	< 0.05	0.001	< 0.1	0.059	1.5	< 1	1.5	< 0.2	< 1	6.6
EPA 25	N	10/9/1995	6,854.70	6.90	7.80	3789	745	202	148	7.2	791	1696	80	0.14	62.9	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.51	< 0.1	< 0.05	0.001	< 0.1	0.069	3.5	< 1	3.5	1.4	< 1	3.2
EPA 25	N	1/8/1996	6,854.30	6.80	7.36	3963	745	212	139	6.9	841	1826	71	< 0.05	86.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.25	< 0.1	< 0.05	< 0.001	< 0.1	0.009	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	4/9/1996	6,854.00	6.90	7.76	3942	790	206	135	7.2	937	1766	87.4	0.11	62.6	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.46	< 0.1	< 0.05	< 0.001	< 0.1	0.066	0.4	< 1	0.4	< 0.2	< 1	< 1
EPA 25	N	7/17/1996	6,853.70	6.70	7.10	3928	710	182	145	7.9	964	1816	95	0.07	67.2	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.39	< 0.1	< 0.05	< 0.001	< 0.1	0.189	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	10/8/1996	6,853.60	6.70	7.09	4000	767	199	144	7.9	981	1742	89	0.08	59.6	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.41	< 0.1	< 0.05	< 0.001	< 0.1	0.078	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	1/27/1997	6,853.30	6.70	7.99	3960	760	200	135	8.1	952	1939	117	0.06	60.8	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.51	< 0.1	< 0.05	< 0.001	< 0.1	0.063	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	4/14/1997	6,854.20	6.50	7.96	4020	851	215	142	8.3	981	1777	100	< 0.05	78.9	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.29	< 0.1	< 0.05	0.006	< 0.1	0.095	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	7/14/1997	6,852.90	6.70	7.70	4070	803	205	135	7.7	986	1670	101	0.06	71.5	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.32	< 0.1	< 0.05	0.001	< 0.1	0.082	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	10/14/1997	6,853.00	6.60	7.71	4010	835	213	140	7.9	933	1800	115	0.08	77.7	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.44	< 0.1	< 0.05	0.001	< 0.1	0.093	1.1	< 1	1.1	< 0.2	< 1	< 1
EPA 25	N	1/20/1998	6,852.80	6.50	7.83	4080	739	206	155	7.9	952	1930	96.4	0.19	75.3	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.36	< 0.1	< 0.05	< 0.001	< 0.1	0.094	0.7	< 1	0.7	< 0.2	< 1	< 1
EPA 25	N	4/13/1998	6,852.70	6.90	7.33	4060	799	210	156	8.3	1020	1700	87.3	< 0.05	76.9	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.35	< 0.1	< 0.05	< 0.001	< 0.1	0.0999	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	7/13/1998	6,852.60	6.90	7.64	4210	804	213	155	8.5	1040	1680	92.6	< 0.05	78.4	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.31	< 0.1	< 0.05	< 0.001	< 0.1	0.104	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	10/13/1998	6,853.20	6.77	8.14	3950	771	214	158	8.6	886	1730	89.3	0.13	69.7	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.61	< 0.1	< 0.05	< 0.001	< 0.1	0.0987	0.4	< 1	0.4	< 0.2	< 1	< 1
EPA 25	N	1/12/1999	6,853.00	6.80	7.86	4060	733	197	137	8	930	1600	89.5	0.08	78.5	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.76	< 0.1	< 0.05	< 0.001	< 0.1	0.151	0.8	< 1	0.8	< 0.2	< 1	< 1
EPA 25	N	4/13/1999	6,852.70	6.80	7.97	4040	813	196	146	7.8	969	1620	93.6	0.05	75	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.55	< 0.1	< 0.05	< 0.001	< 0.1	0.0096	< 0.2	1.6	1.6	< 0.2	< 1	< 1
EPA 25	N	7/20/1999	6,852.68	6.80	7.85	4040	762	226	140	9	941	1740	84	0.07	72.4	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.3	< 0.1	< 0.05	< 0.001	< 0.1	0.103	1.5	1.4	2.9	< 0.2	< 1	2.2

TABLE A.1

Southwest Alluvium Data Summary, 1989-2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
EPA 25	N	10/12/1999	6,852.40	6.83	7.75	4090	736	201	139	8	959	1520	87.7	0.06	85.7	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.33	< 0.1	< 0.05	< 0.001	< 0.1	0.104	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	1/11/2000	6,852.30	6.80	7.97	4060	752	206	139	9.2	934	1500	79.6	< 0.05	90.8	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.3	< 0.1	< 0.05	0.001	< 0.1	0.0928	0.5	< 1	0.5	0.7	< 1	< 1
EPA 25	N	5/9/2000	6,852.70	6.80	7.77	4030	691	214	160	8.2	813	1670	75.3	< 0.05	105	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.96	< 0.1	< 0.05	< 0.001	< 0.1	0.0935	< 0.2	2.9	2.9	< 0.2	< 1	< 1
EPA 25	N	7/18/2000	6,852.40	6.88	7.70	4120	682	219	157	7.54	778	1600	67.7	< 0.05	112	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.96	< 0.1	< 0.05	< 0.001	< 0.1	0.0865	< 0.2	2	2	< 0.2	< 1	< 1
EPA 25	N	10/10/2000	6,852.25	6.89	7.75	3990	557	184	132	7.6	761	1240	53	0.05	121	< 1	< 0.1	0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.11	< 0.1	< 0.05	< 0.001	< 0.1	0.095	< 0.2	1.3	1.3	< 0.2	< 1	< 1
EPA 25	N	1/9/2001	6,852.10	7.12	7.89	3910	699	234	155	7	761	1760	63.4	< 0.05	106	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.25	< 0.1	< 0.05	0.002	< 0.1	0.086	< 0.2	2.7	2.7	< 0.2	< 1	< 1
EPA 25	N	2/6/2001	6,852.10	7.33	7.34	3970	792	251	135	8.3	783	1930	64.3	0.06	106	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.33	< 0.1	< 0.05	0.002	< 0.1	0.094	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	3/6/2001	6,852.15	7.27	7.87	3710	676	224	186	8.2	757	1840	58.7	< 0.05	105	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.35	< 0.1	< 0.05	0.001	< 0.1	0.0911	< 0.2	2.4	2.4	< 0.2	< 1	< 1
EPA 25	N	4/10/2001	6,852.25	7.41	7.34	3940	778	241	143	7.9	782	1910	71.7	0.08	101	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.45	< 0.1	< 0.05	0.001	< 0.1	0.091	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	5/8/2001	6,852.00	7.02	7.67	3990	668	222	148	7.6	715	1570	74.2	0.13	108	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.42	< 0.1	< 0.05	0.001	< 0.1	0.091	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	6/5/2001	6,852.10	7.03	7.57	3920	705	236	132	7.3	785	1780	71.2	0.12	94.7	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.53	< 0.1	< 0.05	0.001	< 0.1	0.09	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	7/10/2001	6,852.10	7.29	7.39	4060	730	244	159	7.3	817	1720	75.8	0.1	103	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.58	< 0.1	< 0.05	0.001	< 0.1	0.0981	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	8/7/2001	6,852.02	7.26	7.50	4060	650	220	150	7.6	819	1600	82	0.13	94	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.4	< 0.1	< 0.05	< 0.001	< 0.1	0.1	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	9/11/2001	6,852.30	6.81	7.80	4130	680	220	154	7.8	841	1630	85.9	0.08	111	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.5	< 0.1	< 0.05	< 0.001	< 0.1	0.0904	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	10/2/2001	6,852.40	6.96	7.60	4090	670	220	142	7.9	883	1700	100	0.11	97	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.42	< 0.1	< 0.05	< 0.001	< 0.1	0.0949	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	11/6/2001	6,852.40	6.95	7.70	4040	719	232	149	8.5	841	1800	96	0.06	92	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.46	< 0.1	< 0.05	< 0.001	< 0.1	0.0852	0.3	< 1	0.3	< 0.2	< 1	< 1
EPA 25	N	12/4/2001	6,852.55	7.09	7.70	4020	675	215	138	7.4	852	1580	86.6	0.07	93	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.21	< 0.1	< 0.05	< 0.001	< 0.1	0.0877	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	1/8/2002	6,852.40	7.09	7.70	4030	774	239	136	9	783	1870	97.5	0.06	91.5	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.45	< 0.1	< 0.05	< 0.001	< 0.1	0.0872	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	2/5/2002	6,852.30	7.08	7.60	4010	761	228	149	8.7	778	1760	92.4	0.07	92.4	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.61	< 0.1	< 0.05	< 0.001	< 0.1	0.0814	0.4	2.4	2.8	< 0.2	< 1	< 1
EPA 25	N	3/5/2002	6,852.30	6.98	7.70	3980	731	230	158	8.2	827	1800	89.3	0.07	91.6	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.69	< 0.1	< 0.05	< 0.001	< 0.1	0.0975	< 0.2	1.9	1.9	< 0.2	< 1	< 1
EPA 25	N	4/2/2002	6,852.20	6.89	7.84	4070	760	226	161	9	854	1800	87.3	0.08	91.8	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.6	< 0.1	< 0.05	< 0.001	< 0.1	0.0939	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	5/7/2002	6,852.40	6.95	7.68	4030	733	222	158	9.1	828	1720	88.3	0.07	91.5	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.77	< 0.1	< 0.05	< 0.001	< 0.1	0.0994	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	6/4/2002	6,852.35	6.90	7.70	4050	745	230	149	7.6	831	1780	79.9	0.07	85.6	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.49	< 0.1	< 0.05	< 0.001	< 0.1	0.0864	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	7/9/2002	6,852.25	6.90	7.84	4130	719	230	165	6.6	850	1760	106	0.2	92.5	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.45	< 0.1	< 0.05	< 0.001	< 0.1	0.087	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	10/7/2002	6,852.00	7.08	7.67	3510	647	212	160	6.9	802	1560	70	0.16	82.1	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.62	< 0.1	< 0.05	< 0.001	< 0.1	0.0778	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	1/7/2003	6,852.06	7.20	7.67	4030	699	230	168	7.5	819	1770	87.6	0.27	88	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.74	< 0.1	< 0.05	< 0.001	< 0.1	0.108	< 0.2	< 1	0	< 0.2	< 1	< 1.0
EPA 25	N	4/8/2003	6,851.96	6.89	7.52	4060	679	207	169	10.2	802	1570	86.9	0.25	105	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.72	< 0.1	< 0.05	< 0.001	< 0.1	0.108	< 0.2	< 1	0	< 0.2	< 1	< 1.0
EPA 25	N	7/8/2003	6,851.96	6.71	7.72	4270	650	209	157	8.8	825	1710	74.3	0.23	99	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2	< 0.1	< 0.05	< 0.001	< 0.1	0.0807	< 0.2	< 1	0	< 0.2	< 1	< 1.0
EPA 25	N	10/7/2003	6,852.00	6.77	7.66	4190	748	245	177	8.4	836	1880	89.5	0.27	93	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.06	< 0.1	< 0.05	< 0.001	< 0.1	0.1	< 0.2	< 1	0	< 0.2	< 1	< 1.0
EPA 25	N	1/6/2004	6,851.91	6.92	7.70	4150	704	232	171	7.9	875	1830	85.2	0.27	99.4 D	< 1.0	0.2	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.32	< 0.1	< 0.05	< 0.001	< 0.1	0.0875 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
EPA 25	N	4/6/2004	6,852.00	7.20	7.14	4180	714	230	169	8.1	868	1750 D	93.1	0.33	99.6 D	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.29	< 0.1	< 0.05	0.002	< 0.1	0.0943 D	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	7/13/2004	6,851.77	6.73	7.07	4300	736	234	174	8.9	848	1750 D	90	0.25	96.5 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.06	< 0.1	< 0.05	< 0.001	< 0.1	0.0934 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
EPA 25	N	10/5/2004	6,851.62	6.87	7.39	4250	712 D	230 D	186	7.6	838	1740 D	87	0.06	89.3 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.32	< 0.1	< 0.05	0.001	< 0.1	0.0969 D	< 0.2	1.3	1.3	< 0.2	< 1.0	< 1.0
EPA 25	N	1/4/2005	6,851.81	7.07	7.34	4210	730 D	227 D	166	8.2	892	1640 D	90	0.18	97 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.29	< 0.1	< 0.05	< 0.001	< 0.1	0.101	< 0.2	1.6	1.6	< 0.2	< 1.0	< 1.0
EPA 25	N	4/5/2005	6,851.54	6.96	7.40	4020	744	244	176	7.6	821	1770	91	0.1	87	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2	< 0.1	< 0.05	< 0.001	< 0.1	0.0997	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
EPA 25	N	7/12/2005	6,851.38	6.86	7.33	4060	744 D	236 D	169	6.9	833	1740 D	91	0.13	91 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.39	< 0.1	< 0.05	< 0.001	< 0.1	0.0946	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
EPA 25	N	10/4/2005	6,851.35	6.86	7.46	4100	727 D	231 D	170	7.9	891	1770 D	99	0.09	84 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.23	< 0.1	< 0.05	< 0.001	< 0.1	0.102	< 0.2	2	2	< 0.2	< 1.0	1.4
EPA 25	N	1/10/2006	6,851.18	7.00	7.56	4020	684	221	171	6.3	900	1650 D	87	0.08	96 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.24	< 0.1	< 0.05	< 0.001	< 0.1	0.105	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
EPA 25	N	4/4/2006	6,851.18	6.85	7.32	4130	783 D	256 D	168	8.3	838	1810 D	100	0.16	103 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.46	< 0.1	< 0.05	< 0.001	< 0.1	0.103 D	< 0.2	2.4	2.4	< 0.2	< 1.0	< 1.0
EPA 25	N	7/18/2006	6,851.03	6.84	6.96	4150	748 D	241 D	179	8.3	903	1920 D	95	0.14	89 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.05	< 0.1	< 0.05	< 0.001	< 0.1	0.103	< 0.2	2.3	2.3	< 0.2	< 1.0	< 1.0
EPA 25	N	10/3/2006	6,851.03	6.80	7.31	3880	702 D	224 D	184 D	7.8	921	1720 D	99	0.18	82 D	< 0.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.85	< 0.1	< 0.05	< 0.001	< 0.1	0.104	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 25	N	1/9/2007	6,851.14	7.00	6.95	4040	622 D	203 D	142	6.7	927	1510	86	0.07	87 D	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	2.04	<0.1	<0.05	<0.001	<0.1	0.0884	<0.2	<1	0	<0.2	<1	<1
EPA 25	N	4/10/2007	6,851.25	6.92	7.16	4110	733 D	234 D	154	8.6	935	1760 D	99	<0.05	99 D	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	2.18	<0.1	<0.05	<0.001	<0.1	0.109	<0.2	<1	0	<0.2	<1	<1
EPA 25	N	7/10/2007	6,850.88	6.89	6.80	4040	732 D	245 D	166	7.5	1020	1640	91	0.06	84 D	<0.5	<0.1	0.01	<0.01	<0.005	<0.01	<0.05	1.03	<0.1	<0.05	<0.001	<0.1	0.111	<0.2	<1	0	<0.2	<1	<1
EPA 25	N	10/2/2007	6,850.86	6.82	7.19	4100	679 D	215 D	168 D	8.8	1010	1650 D	120 D	0.08	90 D	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	2.48	<0.1	<0.05	<0.001	<0.1	0.114	<0.2	<1	0	<0.2	<1	<1
EPA 25	N	1/15/2008	6,850.98	6.91	7.08	4150	736 D	227 D	172 D	9	952	1670 D	125 D	< 0.05	87 D	< 0.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.06	< 0.1	< 0.05	< 0.001	< 0.1	0.103	< 0.2	< 1	0	< 0.2	< 1	1.2
EPA 25	N	4/8/2008	6,851.28	6.78	7.16	3890	803 D	256 D	195 D	8.2 D	994	1860 D	92	< 0.1	134 D	< 0.50	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.32	< 0.1	< 0.05	< 0.001	< 0.1	0.113	0.1 U	-0.5 U	-0.4	0.4	-13.5 U	0.9 U
EPA 25	N	7/8/2008	6,850.78	6.54	7.39	4160	723	214	157 D	7	1040	1770 D	71	< 0.05	88.7 D	< 0.5	< 0.1	< 0.003	< 0.01	< 0.005	< 0.01	< 0.05	2.45	< 0.1	< 0.05	< 0.001	< 0.1	0.104	0.21	1.5	1.71	0 U	2.5 U	0.3 U
EPA 25	N	10/7/2008	6,850.40	6.82	7.11	4000	686	231	168 D	7	921	2010 D	85	0.2	106 D	< 0.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.4	< 0.1	< 0.05	< 0.001	< 0.1	0.0996	-0.09 U	0.25 U	0.16	-0.1 U	-2 U	1.4
EPA 25	N	1/13/2009	6,850.48	6.76	6.90	4160	654	220	167	6	995	1590 D	64	<0.05	102 D	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.44	<0.1	<0.05	<0.001	<0.1	0.116	0.08 U	-0.05 U	0.08	-0.2 U	-2 U	1.1
EPA 25	N	4/7/2009	6,850.23	6.72	6.92	4090	688 D	231 D	178 D	6	1030	1800 D	88	<0.05	72.0 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.5	<0.1	<0.05	<0.001	<0.1	0.127	-0.01 U	0.76 U	0.76	0.1 U	-3 U	0.2 U
EPA 25	N	7/7/2009	6,850.18	6.64	7.08	4150	700	224	166	7	1110	1750 D	95	<0.05	72 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.66	<0.1	<0.05	<0.001	<0.1	0.115	-0.1 U	-0.08 U	-0.1	0.1 U	-1 U	0.5
EPA 25	N	10/6/2009	6,849.88	6.70	7.53	4150	717	230	173	7	1130	1820 D	88	<0.05	77 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.46	<0.1	<0.05	<0.001	<0.1	0.128	0.13	0.21 U	0.34	0.04 U	-1 U	0.1 U
EPA 25	N	1/5/2010	no data	no data	7.19	4280 D	756 D	228	194	7	1150	1890 D	99	<0.05	85 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.4	<0.1	<0.05	<0.001	<0.1	0.117	0.01 U	0.03 U	0.04	0.04 U	-0.3 U	0.5 U
EPA 25	N	4/6/2010	6,849.68	6.80	7.00	4210 D	709 D	217	174 D	7	1190	1860 D	101	<0.05	78 D	<0.50	<0.1	0.001	<0.01	<0.005	<0.01	<0.05	1.13	<0.1	<0.05	<0.001	<0.1	0.13	0.16	0.51 U	0.67	0.02 U	2.7 U	0.1 U
EPA 25	N	7/13/2010	6,849.48	6.61	7.20	4210 D	788	235	186	8	1170	1790 D	95 D	<0.05	74 D	<0.50	0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.07	<0.1	<0.05	<0.001	<0.1	0.117	-0.1 U	0.19 U	0.09	0.09 U	0.3 U	0.09 U
EPA 25	N	10/5/2010	6,849.38	6.82	7.43	4260 D	736	224	180	7	1160	1800 D	91 D	0.05	75 D	<0.50	<0.1	0.001	<0.01	<0.005	<0.01	<0.05	0.2	<0.1	<0.05	<0.001	<0.1	0.122	-0.08 U	0.88 U	0.8	-0.007 U	1.0 U	0.2 U
EPA 25	N	1/4/2011	6,849.18	6.72	7.39	4000 D	759	237	179	7	1180	1800 D	105 D	<0.05	66 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.1	<0.1	<0.05	<0.001	<0.1	0.118	0.01 U	0.53 U	0.54	0.06 U	-0.06 U	0.2 U
EPA 25	N	4/5/2011	6,839.68	6.82	7.02	4290 D	748	224	196	7	1190	1820 D	105 D	<0.05	93 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.26	<0.1	<0.05	<0.001	<0.1	0.115	-0.08 U	1.1	1.02	0.006 U	-0.2 U	-0.04 U

TABLE A.1
Southwest Alluvium Data Summary, 1989-2019
United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	NA	8.2	4.5	5.9	15
EPA 25	N	7/12/2011	6,848.96	6.83	7.37	4060 D	742	231	188	7	1150	1780 D	101 D	<0.1	82 D	<0.50	0.2	<0.001	<0.01	<0.005	<0.01	<0.05	0.5	<0.1	<0.05	<0.001	<0.1	0.117	0.04 U	0.71 U	0.75	0.01 U	0.1 U	0.01 U
EPA 25	N	10/4/2011	6,848.87	6.93	7.46	4120 D	770	228	190	8	1110	1840 D	106 D	<0.1	80 D	<0.50	<0.1	0.002	<0.01	<0.005	<0.01	<0.05	0.27	<0.1	<0.05	<0.001	<0.1	0.113	-0.09 U	-0.3 U	-0.39	-0.007 U	0.6 U	-0.009 U
EPA 25	N	1/3/2012	6,848.67	7.02	7.00 H	4140 D	793	239	192	9	1080	1780 D	103 D	<0.05	78 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.18	<0.1	<0.05	<0.001	<0.1	0.12	0.31	-0.5 U	0.31	0.08 U	0.05 U	0.07 U
EPA 25	N	4/3/2012	6,848.53	6.96	6.90 H	4170 D	756	217	177	7	1110	1790 D	103 D	<0.05	75 D	<0.50	0.2	<0.01	<0.01	<0.005	<0.01	<0.05	0.21	<0.1	<0.05	<0.001	<0.1	0.11	-0.05 U	0.63 U	1.26	0.008 U	0.2 U	-0.05 U
EPA 25	N	7/10/2012	6,848.28	6.73	6.93 H	4260	797	245	196 D	8	1160	1750 D	103 D	0.08	79 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.06	<0.1	<0.05	<0.001	<0.1	0.148	-0.03 U	0.31 U	0.62	0.02 U	0.2 U	0.2 U
EPA 25	N	10/9/2012	6,848.18	6.86	6.90 H	4180	810	226	191 D	8	1240	1830 D	115 D	<0.05	72 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.23	<0.1	<0.05	<0.001	<0.1	0.12	-0.05 U	0.21 U	0	-0.01 U	0.4 U	-0.02 U
EPA 25	N	1/14/2013	6,848.17	6.83	6.88 H	4290	830	242	207 D	8	1210	1860 D	114 D	<0.05	90 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.1	<0.1	<0.05	<0.001	<0.1	0.135	-0.06 U	0.95 U	0	0.03 U	0.4 U	0.08 U
EPA 25	N	4/2/2013	6,848.03	6.90	6.92 H	4310	777	234	196	8	1250	1800 D	113 D	<0.05	74 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.22	<0.1	<0.05	<0.001	<0.1	0.134	-0.02 U	0.30 U	0	0.03 U	-0.8 U	0.6
EPA 25	N	7/9/2013	6,847.70	6.67	6.95 H	4300	787	238	204	8	1260	1820 D	109 D	<0.05	70 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.14	<0.1	<0.05	<0.001	<0.1	0.121	0.06 U	-0.2 U	0	0.02 U	-0.2 U	0.1 U
EPA 25	N	10/1/2013	6,848.24	6.76	6.91 H	4360	757	232	199	7	1280	1840 D	109 D	<0.05	88 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.3	<0.1	<0.05	<0.001	<0.1	0.139	0.16	1.6	1.76	0.03 U	0.05 U	0.05 U
EPA 25	N	1/7/2014	6,847.97	7.03	6.86	4300	745	227	192	7	1260	1800	109	<0.05	81	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.86	<0.1	<0.05	<0.001	<0.1	0.128	0.12	-1 U	0.12	-0.008 U	-0.1 U	-0.04 U
EPA 25	N	4/1/2014	6,847.84	6.91	7.05 H	4200	778	232	205 D	8	1250	1830 D	121 D	<0.05	68 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.17	<0.1	<0.05	<0.001	<0.1	0.124	0.17	0.42 U	0.17	0.03 U	-0.06 U	-0.2 U
EPA 25	N	7/8/2014	6,847.49	6.92	6.89 H	4060	727	251	213 D	8	1020	1810 D	115 D	<0.05	69 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.27	<0.1	<0.05	<0.001	<0.1	0.111	0.10 U	0.94 U	0	0.04 U	0.06 U	0.05 U
EPA 25	N	10/7/2014	6,847.55	6.86	6.84 H	4380	766	234	200	8	1330	1880 D	120 D	<0.05	68 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.35	<0.1	<0.05	<0.001	<0.1	0.128	0.09 U	1.1 U	0	0.04 U	-0.2 U	0.09 U
EPA 25	N	1/6/2015	6,847.38	6.90	6.77 H	4300	716	227	200	8	1250	1880 D	144 D	<0.05	67 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.16	<0.1	<0.05	<0.001	<0.1	0.13	0.11 U	0.0 U	0	0.003 U	-0.3 U	0.3 U
EPA 25	N	4/7/2015	6,847.22	6.79	6.85 H	4400	753	234	208	8	1350	1830 D	142 D	<0.05	65 D	<0.5	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.42	<0.1	<0.05	<0.001	<0.1	0.122	0.24	-0.006 U	0.24	0.3	-0.3 U	-0.4 U
EPA 25	N	7/7/2015	6,847.05	6.62	6.77 H	4490	738	239	202	8.1	1400	1910 D	134 D	0.07	65 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.68	<0.1	<0.05	<0.001	<0.1	0.114	0.10 U	-0.2 U	0	0.06 U	-0.4 U	-0.4 U
EPA 25	N	10/6/2015	6,846.80	6.87	6.83 H	4460	752	230	202	8	1320	1930 D	138 D	<0.05	62 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.26	<0.1	<0.05	<0.001	<0.1	0.123	-0.03 U	0.25 U	0	0.1 U	0.2 U	0.5 U
EPA 25	N	1/5/2016	6,846.76	6.86	6.80 H	4390	785	243	211	8	1410	1890 D	135 D	<0.05	67 D	<0.50	0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.51	<0.1	<0.05	<0.001	<0.1	0.114	0.09 U	0.07 U	0	0.06 U	-0.2 U	-0.4 U
EPA 25	N	4/5/2016	6,846.53	6.74	6.92 H	4390	785	238	210	8	1250	1940 D	137 D	<0.05	66 D	<0.50	0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.5	<0.1	<0.05	<0.001	<0.1	0.124	0.16	0.89 U	0.16	0.02 U	-0.4 U	0.2 U
EPA 25	N	7/12/2016	6,846.32	6.76	6.80 H	4490	785	240	206	8	1390	2020 D	147 D	<0.05	71 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.85	<0.1	<0.05	<0.001	<0.1	0.113	0.09 U	1.8	1.8	0.1 U	-0.1 U	0.2 U
EPA 25	N	10/4/2016	6,846.18	6.87	6.84 H	4420	773	245	217	8	1400	1940 D	136 D	<0.05	70 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.87	<0.1	<0.05	<0.001	<0.1	0.109	0.11 U	0.46 U	0	0.04 U	-0.07 U	0.8 U
EPA 25	N	1/10/2017	6,846.01	6.81	6.86 H	4370 D	820	243	211	8	1370	1900 D	136 D	<0.05	72 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.54	<0.1	<0.05	<0.001	<0.1	0.113	0.16	1.4 U	0.16	0.05 U	-0.5 U	1.7
EPA 25	N	4/4/2017	6,845.83	6.65	6.84 H	4360 D	761	238	211	8	1360	2000 D	150 D	<0.05	35 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.7	<0.1	<0.05	<0.001	<0.1	0.122	0.15	0.14 U	0.15	0.08 U	-0.08 U	0.8 U
EPA 25	N	7/11/2017	6,845.60	6.73	6.85 H	4270 D	777	247	213 D	9	1370	1800 D	138 D	<0.05	65.5 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.45	<0.1	<0.05	<0.001	<0.1	0.116	0.1 U	0.8 U	0	0.08 U	0.2 U	0.2 U
EPA 25	N	10/3/2017	6,845.28	6.72	6.85 H	4440 D	795	242	219 D	7	1440	1790 D	145 D	<0.05	61.0 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.44	<0.1	<0.05	<0.001	<0.1	0.13	0.06 U	0.5 U	0	0.005 U	-0.1 U	0.6
EPA 25	N	1/9/2018	6,845.24	6.84	6.85 H	4410 D	775	238	204 D	7	1320	1940 D	146 D	0.05	63.5 D	<0.50	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	0.485	<0.001	<0.005	<0.001	<0.01	0.137	0.2	1.1 U	0.2	0.1 U	-0.2 U	0.3 U
EPA 25	N	4/3/2018	6,845.06	6.78	6.99 H	4550 D	782	238	214	8	1350	1960 D	152 D	<0.05	67 D	<0.50	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	0.316	<0.001	<0.005	<0.001	<0.01	0.12	0.2	0.1 U	0.2	0.1 U	0.2 U	0.3 U
EPA 25	N	7/10/2018	6,844.84	6.67	6.79 H	4470 D	836 D	230	196	7 D	1380	1830 D	141 D	<0.05	71.0 D	<0.50	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	0.676	<0.001	<0.005	0.001	<0.01	0.126	0.1 U	-0.4 U	0	0.03 U	0.02 U	0.2 U
EPA 25	N	10/2/2018	6,844.56	6.74	6.82 H	4540 D	821	257	225 D	9	1400	1990 D	150 D	<0.05	66.0 D	<0.50	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	0.478	<0.001	<0.005	<0.001	<0.01	0.126	0.02 U	1.9	1.9	-0.03 U	-0.1 U	0.4 U
EPA 25	N	1/8/2019	6,844.34	6.68	6.86 H	4520	815	253	235	9	1410	1880	140	<0.05	62.5	<0.50	<0.03	no data	<0.001	<0.001	<0.005	<0.001	0.321	<0.001	<0.005	no data	<0.01	0.126	0.07	0.7	0.77	0.09	0.07	0.8
EPA 25	N	4/9/2019	6,844.34	6.63	6.92 H	4590 D	791	250	227	8	1430	1950 D	152 D	<0.05	66.2 D	<0.50	<0.03	0.002	<0.001	<0.001	<0.005	<0.001	0.361	<0.001	<0.005	<0.001	<0.01	0.12	0.08	0.3 U	0.38	0.0009	0.08 U	0.4 U
EPA 25	N	7/30/2019	6,843.97	6.73	6.91 H	4550 DH	780	245	212	8	1420	1840 D	142 D	<0.05	65.5 D	<0.50	<0.03	0.001	<0.001	<0.001	<0.005	<0.001	0.652 D	<0.001	<0.005	<0.001	<0.01	0.124	0.2	1.7 U	1.9	-0.01 U	0.1 U	0.2
EPA 25	N	10/9/2019	6,843.66	6.66	6.85 H	4450 D	780	249	227	9	1410	1890 D	148 D	<0.2 D	64 D	<0.50	<0.1 D	<0.001	<0.001	<0.001	<0.005	<0.001	0.16 D	<0.003 D	<0.005	<0.002 D	<0.01	0.114 D	0.1	-0.2 U	-0.1	0.02 U	-0.02 U	0.3 U
EPA 27	N	7/29/1989	6,864.90	8.00	7.26	4537	554	221	371	23.5	171	2253	76.8	0.12	216	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	< 0.01	0.03	< 0.05	0.004	< 0.1	0.0138	0.4	1.9	2.3	3.2	< 1	< 1
EPA 27	N	10/4/1989	6,864.80	8.10	7.80	4734	550	242	329	22.4	196	2266	74.5	0.09	150	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	< 0.01	0.03	< 0.05	0.006	< 0.1	0.032	0.6	1.8	2.4	< 0.2	< 1	1.1
EPA 27	N	1/23/1990	6,865.00	8.00	7.40	4680	538	268	340	17	223	2217	78.8	0.11	180	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.01	< 0.1	< 0.05	0.005	< 0.1	0.046	< 0.2	1.5	1.5	1.4	< 1	1.7
EPA 27	N	4/18/1990	6,864.70	7.90	7.55	4775	530	260	340	13.4	283	2160	79.6	0.08	182	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.01	< 0.1	< 0.05	0.005	< 0.1	0.027	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 27	N	7/13/1990	6,864.10	8.90	7.74	4731	562	239	348	20.4	167	2073	79.7	< 0.05	202	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	0.002	< 0.1	0.0213	< 0.2	< 1	0	0.8	1	< 1
EPA 27	N	10/16/1990	6,864.20	8.20	7.78	4786	558	238	372	16.8	183	2324	89.4	0.05	196	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.04	< 0.05	< 0.01	< 0.1	< 0.05	0.003	< 0.1	0.0282	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 27	N	1/10/1991	6,864.30	7.70	7.60	4274	574	288	381	17.1	143	2074	83.8	0.13	171	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.02	< 0.05	0.01	< 0.1	< 0.05	0.006	< 0.1	0.0286	0.8	< 1	0.8	< 0.2	< 1	1.2
EPA 27	N	4/16/1991	6,864.30	7.60	8.12	4727	547	228	350	16.3	179	2296	85.3	< 0.05	256	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	0.004	< 0.1	0.024	< 0.2	< 1	0	< 0.2	1.3	< 1
EPA 27	N	7/9/1991	6,863.80	7.50	7.68	4925	528	253	326	14.9	121	2420	81.3	< 0.05	200	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.01	< 0.1	< 0.05	0.005	< 0.1	0.0347	0.4	< 1	0.4	< 0.2	< 1	< 1
EPA 27	N	10/23/1991	6,863.30	7.70	7.70	4461	452	146	359	19.4	122	2229	98	0.31	141	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.01	no data	0.01	< 0.1	< 0.05	0.006	< 0.1	0.032	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 27	N	1/23/1992	6,863.00	7.80	7.47	4570	519	196	335	13	129	2103	92.1	< 0.05	125	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.02	< 0.1	< 0.05	0.001	< 0.1	0.039	0.5	1	1.5	< 0.2	1.6	< 1
EPA 27	N	4/3/1992	6,862.90	7.30	7.87	4087	581	248	416	18.7	208	2443	82.5	< 0.05	194	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.02	< 0.1	< 0.05	0.096	< 0.1	0.014	< 0.2	< 1	0	< 0.2	2.4	< 1
EPA 27	N	7/16/1992	6,862.10	8.20	7.76	4239	454	225	441	17	73.4	2224	99	< 0.05	150	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	0.006	< 0.1	0.024	0.6	2.5	3.1	< 0.2	< 1	< 1
EPA 27	N	10/15/1992	6,861.60	7.90	7.76	4534	566	213	374	17.3	75.4	2302	99.1	< 0.05	147	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.01	< 0.1	< 0.05	0.007	< 0.1	0.029	0.9	5.1	6	< 0.2	2.2	< 1
EPA 27	N	1/12/1993	6,861.00	7.90	7.85	4496	571	217	395	16.1	116	2386	98.9	< 0.05	195	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	0.031	< 0.1	0.011	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 27	N	4/15/1993	6,861.00	7.90	7.86	4612	472	237	389	10.2	96.3	2260	111	0.07	150	< 1	< 0.1	0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.02	< 0.1	< 0.05	0.011	< 0.1	0.023	< 0.2	< 1	0	< 0.2	1.9	< 1
EPA 27	N	7/21/1993	6,860.40	8.50	7.87	4408	519	198	387	15.5	81.6	2195	104	< 0.05	141	< 1	< 0.1	0.001	< 0.01	< 0.01	0.01	< 0.05	0.02	< 0.1	< 0.05	0.015	< 0.1	0.018	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 27	N	10/12/1993	6,858.70	8.10	6.79	3844	551	183	314	14.1	74.7	2175	101	0.05	92.5	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.01	< 0.1	< 0.05	0.011	< 0.1	0.019	0.5	< 1	0.5	< 0.2	1.9	< 1
EPA 27	N	1/11/1994	6,859.70	8.10	7.75	4266	501	183	320	13	103	2181	97.8	< 0.05	122	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.01	< 0.1	< 0.05	0.01	< 0.1	0.023	< 0.2	1.7	1.7	< 0.2	< 1	3.5
EPA 27	N	4/19/1994	6,859.30	6.50	8.12	4020	509	172	373	15.3	80.6	2073	107	0.2	143	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	0.009	< 0.1	0.019	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 27	N	7/27/1994	6,859.00	8.00	7.77	3954	568	143	307	16.7	58.6	2060	108	< 0.05	148	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	0.007	< 0.1	0.014	0.9	3.8	4.7	< 0.2	1.9	6.8
EPA 27	N	10/11/1994	6,858.60	8.00	7.83	4264	565	223	377	12.1	67.8	2245	108	0.09	141	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	0.008	< 0.1	0.021	0.3	< 1	0.3	< 0.2	1	< 1
EPA 27	N	1/11/1995	6,858.20	8.30	7.54	4030	552	151	337	16.3	74.8	2066	113	0.16	190	< 1	< 0.1	0.002	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	0.011	< 0.1	0.017	< 0.2	2.6	2.6	< 0.2	3	4.3
EPA 27	N	4/11/1995	6,858.10	7.50	8.02	4125	541	169	354	15.6	63.1	2054	118	0.21	149	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.01	< 0.1	< 0.05	0.011	< 0.1	0.014	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 27	N	7/11/1995	6,857.80	7.90	7.90	3897	550	134	332	15.6	64.6	1872	118	0.05	129	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.01	< 0.1	< 0.05	0.012	< 0.1	0.011	< 0.2	< 1	0	< 0.2	< 1	< 1

TABLE A.1

Southwest Alluvium Data Summary, 1989-2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
EPA 27	N	10/10/1995	6,857.40	7.90	8.18	3760	535	128	360	18.2	54.2	1796	108	0.05	121	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	0.035	< 0.1	0.0094	0.2	1.5	1.7	< 0.2	< 1	< 1
EPA 27	N	1/9/1996	6,857.10	7.90	7.90	3743	530	126	328	16.1	62.2	1929	116	< 0.05	132	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	0.038	< 0.1	0.011	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 27	N	4/10/1996	6,856.80	8.40	7.97	3875	552	133	324	14.1	57.6	2080	126	0.07	123	< 1	< 0.1	0.002	< 0.01	< 0.01	< 0.01	< 0.05	0.01	< 0.1	< 0.05	0.009	< 0.1	0.013	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 27	N	7/17/1996	6,856.50	7.80	7.82	3730	560	118	348	16.4	45.5	2009	124	< 0.05	143	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	< 0.001	< 0.1	0.01	2.1	< 1	2.1	< 0.2	< 1	< 1
EPA 27	N	10/8/1996	6,856.20	7.70	8.04	3720	524	127	343	16.5	40.4	1865	112	0.13	121	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.1	< 0.05	0.009	< 0.1	0.012	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 27	N	1/28/1997	6,855.90	7.70	7.64	3720	530	135	336	15.4	39.8	1910	156	0.18	113	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	0.08	< 0.1	< 0.05	0.015	< 0.1	0.006	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 27	N	4/15/1997	6,855.90	7.10	7.65	3660	564	111	332	16.8	31.1	1876	120	0.06	139	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	0.042	< 0.1	0.003	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 27	N	7/15/1997	6,855.60	7.50	7.58	3710	547	127	317	16.3	31	1790	123	0.08	116	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	0.019	< 0.1	0.006	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 28	N	7/29/1989	6,867.90	6.90	6.60	4825	548	458	222	10.5	671	2622	110	0.05	74	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.2	< 0.1	< 0.05	0.002	< 0.1	0.0313	0.9	1.8	2.7	6.9	2.6	< 1
EPA 28	N	10/4/1989	6,867.70	6.50	7.20	4989	565	475	216	14.1	738	2720	107	< 0.05	113	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.19	< 0.1	< 0.05	0.002	< 0.1	0.041	2.7	< 1	2.7	4.6	< 1	8.4
EPA 28	N	1/23/1990	6,867.70	6.60	6.80	4904	525	468	227	10.4	756	2434	116	0.09	75	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.01	< 0.05	0.18	< 0.1	< 0.05	0.002	< 0.1	0.045	0.4	3	3.4	1.8	1.3	3.2
EPA 28	N	4/18/1990	6,867.30	6.80	7.12	4977	542	428	207	9.9	815	2330	117	0.12	69	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.17	< 0.1	< 0.05	0.001	< 0.1	0.26	0.8	< 1	0.8	< 0.2	< 1	1.3
EPA 28	N	7/13/1990	6,866.20	6.70	7.21	5037	541	440	212	10	821	2210	126	< 0.05	74.2	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.17	< 0.1	< 0.05	< 0.001	< 0.1	0.0378	< 0.2	1.2	1.2	< 0.2	< 1	< 1
EPA 28	N	10/16/1990	6,866.70	6.50	7.21	5306	548	231	387	17.7	522	3005	111	< 0.05	62.5	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.01	< 0.05	0.23	< 0.1	< 0.05	< 0.001	< 0.1	0.0206	0.8	< 1	0.8	< 0.2	< 1	< 1
EPA 28	N	1/10/1991	6,866.70	6.60	7.17	5138	542	487	232	13.8	627	2732	115	< 0.05	68	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.01	< 0.05	0.21	< 0.1	< 0.05	0.002	< 0.1	0.0268	2.4	< 1	2.4	< 0.2	6.3	3.1
EPA 28	N	4/16/1991	6,866.70	6.50	7.76	5194	497	470	222	11.8	632	2824	123	< 0.05	88	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.01	< 0.01	< 0.05	0.18	< 0.1	< 0.05	< 0.001	< 0.1	0.027	0.9	3.1	4	< 0.2	< 1	< 1
EPA 28	N	7/9/1991	6,866.20	6.40	7.07	5350	477	463	208	10.1	551	2940	107	< 0.05	68	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.2	< 0.1	< 0.05	< 0.001	< 0.1	0.0302	1.4	1.1	2.5	< 0.2	< 1	2
EPA 28	N	10/23/1991	6,865.40	6.40	7.50	5170	488	499	225	11.4	534	2792	114	0.28	52.3	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	0.01	no data	0.21	< 0.1	< 0.05	< 0.001	< 0.1	0.05	0.7	< 1	0.7	< 0.2	< 1	< 1
EPA 28	N	1/23/1992	6,865.10	6.40	7.37	5268	490	448	213	10.2	583	2786	111	0.14	40.6	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	0.23	< 0.1	< 0.05	0.001	< 0.1	0.024	0.8	3.5	4.3	< 0.2	2.7	< 1
EPA 28	N	4/3/1992	6,865.30	6.50	7.46	4613	505	448	263	12.6	612	2934	110	0.22	72.1	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.23	< 0.1	< 0.05	0.008	< 0.1	0.019	0.2	1.4	1.6	< 0.2	< 1	< 1
EPA 28	N	7/16/1992	6,864.40	6.60	7.20	5042	517	489	246	13.6	561	2916	110	0.1	35.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.02	< 0.05	0.23	< 0.1	< 0.05	0.001	< 0.1	0.023	1.7	< 1	1.7	< 0.2	< 1	1.9
EPA 28	N	10/15/1992	6,863.20	6.70	7.21	5249	509	486	236	10.9	550	3015	106	< 0.05	55.5	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.21	< 0.1	< 0.05	< 0.001	< 0.1	0.029	0.9	< 1	0.9	< 0.2	2.6	< 1
EPA 28	N	1/12/1993	6,862.60	6.60	7.16	5095	546	482	244	13.9	584	2973	110	< 0.05	77.9	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	0.24	< 0.1	< 0.05	0.016	< 0.1	0.026	0.4	3.3	3.7	< 0.2	< 1	< 1
EPA 28	N	4/15/1993	6,863.00	6.70	7.49	5230	534	483	251	10	744	2981	122	0.08	63	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.24	< 0.1	< 0.05	< 0.001	< 0.1	0.028	0.6	< 1	0.6	< 0.2	< 1	< 1
EPA 28	N	7/21/1993	6,862.20	6.70	7.49	4999	546	474	249	12.5	561	2968	98.9	< 0.05	49.5	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.01	< 0.05	0.25	< 0.1	< 0.05	< 0.001	< 0.1	0.029	0.5	< 1	0.5	< 0.2	< 1	< 1
EPA 28	N	10/12/1993	6,859.60	7.00	7.18	5002	525	450	223	10.6	603	2913	109	< 0.05	48.6	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.24	< 0.1	< 0.05	0.001	< 0.1	0.038	1	< 1	1	< 0.2	2.8	< 1
EPA 28	N	1/11/1994	6,861.10	7.00	7.73	5378	544	473	236	10.6	562	3132	101	< 0.05	52.8	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.27	< 0.1	< 0.05	< 0.001	< 0.1	0.027	0.3	4.3	4.6	< 0.2	< 1	7.7
EPA 28	N	4/19/1994	6,860.90	6.70	7.71	5077	481	452	232	12.6	527	2901	108	0.06	56.2	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.32	< 0.1	< 0.05	< 0.001	< 0.1	0.026	7	< 1	7	< 0.2	2	7.2
EPA 28	N	7/27/1994	6,860.50	6.70	7.45	5476	611	527	197	12.7	559	3177	102	< 0.05	59.2	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.25	< 0.1	< 0.05	0.002	< 0.1	0.019	0.05	< 1	0.05	< 0.2	< 1	< 1
EPA 28	N	10/11/1994	6,860.00	6.70	7.69	5491	545	574	241	13	614	3325	97.5	0.06	38.6	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.26	< 0.1	< 0.05	< 0.001	< 0.1	0.024	3.7	< 1	3.7	< 0.2	< 1	3.9
EPA 28	N	1/11/1995	6,859.70	6.70	7.65	5614	510	576	202	12.9	586	3257	96.7	0.13	48.2	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.3	< 0.1	< 0.05	< 0.001	< 0.1	0.026	1.3	3.6	4.9	< 0.2	2.6	6.9
EPA 28	N	4/11/1995	6,859.70	6.70	7.39	5089	532	496	217	11.8	601	3028	124	0.15	28.6	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.27	< 0.1	< 0.05	< 0.001	< 0.1	0.025	0.4	< 1	0.4	< 0.2	< 1	< 1
EPA 28	N	7/11/1995	6,859.30	6.90	7.85	4851	535	505	219	11.5	554	2850	115	< 0.05	51.7	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.25	< 0.1	< 0.05	0.002	< 0.1	0.026	1.3	< 1	1.3	< 0.2	1.6	6.9
EPA 28	N	10/10/1995	6,858.80	6.90	7.94	4825	520	495	229	12	549	2802	101	< 0.05	47.2	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.23	< 0.1	< 0.05	0.002	< 0.1	0.027	0.8	1.2	2	0.5	< 1	1.5
EPA 28	N	1/9/1996	6,858.40	7.00	7.29	5029	535	520	207	11.6	528	2979	112	< 0.05	55.3	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.29	< 0.1	< 0.05	0.005	< 0.1	0.027	0.6	< 1	0.6	< 0.2	< 1	< 1
EPA 28	N	4/10/1996	6,858.00	7.10	7.73	5273	508	500	209	10.8	556	3165	124	0.07	48.5	< 1	< 0.1	0.002	< 0.01	< 0.01	< 0.01	< 0.05	0.27	< 0.1	< 0.05	< 0.001	< 0.1	0.033	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 28	N	7/17/1996	6,857.80	7.00	7.08	5267	525	550	227	12.1	531	3045	112	< 0.05	125	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.22	< 0.1	< 0.05	< 0.001	< 0.1	0.032	1.8	< 1	1.8	< 0.2	< 1	< 1
EPA 28	N	10/8/1996	6,857.60	7.00	7.23	5260	538	498	223	11.8	360	2849	108	0.07	47.3	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.27	< 0.1	< 0.05	< 0.001	< 0.1	0.038	1	< 1	1	< 0.2	< 1	< 1
EPA 28	N	1/28/1997	6,857.40	7.00	7.73	5270	545	500	194	11.2	642	2935	157	0.06	47.2	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.27	< 0.1	< 0.05	< 0.001	< 0.1	0.023	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 28	N	4/15/1997	6,857.30	7.00	7.61	5350	574	555	213	12.1	544	3280	116	< 0.05	52.6	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.24	< 0.1	< 0.05	0.005	< 0.1	0.022	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 28	N	7/15/1997	6,857.00	6.80	7.83	5360	539	506	206	11.7	531	2810	119	0.05	44.6	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.19	< 0.1	< 0.05	0.001	< 0.1	0.025	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 28	N	10/15/1997	6,857.10	6.70	7.83	5290	585	543	217	11.5	667	3010	145	0.05	49.5	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.23	< 0.1	< 0.05	0.002	< 0.1	0.035	< 0.2	4.9	4.9	< 0.2	5.5	< 1
EPA 28	N	1/20/1998	6,857.20	6.70	8.07	5330	531	514	224	12.8	540	3250	121	0.16	51.4	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.23	< 0.1	< 0.05	< 0.001	< 0.1	0.028	0.7	< 1	0.7	< 0.2	< 1	< 1
EPA 28	N	4/14/1998	6,856.90	7.00	7.41	5430	549	556	221	12.6	539	2990	95.4	< 0.05	44.5	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.31	< 0.1	< 0.05	< 0.001	< 0.1	0.0261	1.6	< 1	1.6	< 0.2	< 1	2.9
EPA 28	N	7/14/1998	6,856.70	7.00	7.88	5630	538	543	228	12.8	544	2900	101	< 0.05	41.7	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.31	< 0.1	< 0.05	< 0.001	< 0.1	0.0431	0.7	< 1	0.7	< 0.2	< 1	< 1
EPA 28	N	10/13/1998	6,858.40	6.82	7.94	5230	526	525	227	12.4	535	3050	104	0.11	39.5	< 1	< 0.1	< 0.001	< 0.01	0.005	< 0.01	< 0.05	0.18	< 0.1	< 0.05	0.001	< 0.1	0.0315	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 28	N	1/12/1999	6,917.90	6.90	8.02	5380	468	504	204	12.8	538	3100	101	0.08	43.7	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.3	< 0.1	< 0.05	< 0.001	< 0.1	0.0324	0.6	< 1	0.6	< 0.2	< 1	< 1
EPA 28	N	4/13/1999	6,857.70	6.80	8.05	5360	544	550	214	11.9	533	2930	106	0.08	45.1	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.32	< 0.1	< 0.05	< 0.001	< 0.1	0.0251	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 28	N	7/20/1999	6,856.36	6.90	7.94	5390	528	556	235	15	557	3010	106	0.05	40	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.26	< 0.1	< 0.05	0.001	< 0.1	0.0282	0.6	< 1	0.6	< 0.2	< 1	1.6
EPA 28	N	10/12/1999	6,857.30	6.90	7.98	5210	532	518	190	11.3	542	2930	108	< 0.05	40.4	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.17	< 0.1	< 0.05	< 0.001	< 0.1	0.03	0.7	< 1	0.7	< 0.2	< 1	< 1
EPA 28	N	1/11/2000	6,856.80	6.80	8.07	5280	498	514	192	12.8	534	2820	99.6	0.05	39.1	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.31	< 0.1	< 0.05	0.001	< 0.1	0.0256	1.8	3.4	5.2	< 0.2	< 1	3
EPA 28	N	5/9/2000	6,856.60	6.60	7.77	5080	503	477	201	11.3	635	2600	115	< 0.05	49.5	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.5	< 0.1	< 0.05	< 0.001	< 0.1	0.0445	0.5	2	2.5	< 0.2	14.2	< 1
EPA 28	N	7/17/2000	6,856.40	6.66	7.70	5190	534	499	195	11.4	636	2570	119	< 0.05	46.1	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.39	< 0.1	< 0.05	< 0.001	< 0.1	0.0375	< 0.2	1.8	1.8	< 0.2	< 1	< 1
EPA 28	N	10/9/2000	6,856.15	6.90	7.70	5110	460	446	210	13.4	637	2500	110	0.16	52.3	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.37	< 0.1	< 0.05	< 0.001	< 0.1	0.042	< 0.2	1.3	1.3	< 0.2	< 1	< 1
EPA 28	N	1/8/2001	6,856.15	6.88	7.66	5110	538	512	179	11.4	633	2850	116	< 0.05	51	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.42	< 0.1	< 0.05	< 0.001	< 0.1	0.039	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 28	N	2/5/2001	6,856.40	7.01	7.56	5090	615	567	178	12.2	636	3060	107	< 0.05	47.6	< 1	0.6	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.42	< 0.1	< 0.05	< 0.001	< 0.1	0.042	0.5	< 1	0.5	< 0.2	< 1	< 1
EPA 28	N	3/5/2001	6,856.35	7.56	7.53	4670	535	515	155	12.3	644	2910	103	< 0.05	49.4	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.45	< 0.1	< 0.05	< 0.001	< 0.1	0.0398	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 28	N	4/10/2001	6,856.70	7.13	7.42	4950	596	546	188	12.1	650	3010	117	< 0.05	50.1	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.43	< 0.1	< 0.05	< 0.001	< 0.1	0.037	0.5	2	2.5	< 0.2	< 1	< 1
EPA 28	N	5/8/2001	6,856.70	6.81	7.62	5120	520	489	190	11.5	647	2480	118	0.09	53.6	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.47	< 0.1	< 0.05	< 0.001	< 0.1	0.042	< 0.2	< 1	0	< 0.2	< 1	< 1

TABLE A.1
Southwest Alluvium Data Summary, 1989-2019
United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
EPA 28	N	6/5/2001	6,856.75	6.84	7.35	4510	546	532	191	10.3	635	2870	113	0.07	42.3	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.47	< 0.1	< 0.05	0.001	< 0.1	0.038	0.4	< 1	0.4	< 0.2	< 1	< 1
EPA 28	N	7/10/2001	6,856.90	6.94	7.33	5220	554	542	208	11.6	628	2690	97	0.05	48.3	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.48	< 0.1	< 0.05	< 0.001	< 0.1	0.0403	0.7	< 1	0.7	< 0.2	< 1	< 1
EPA 28	N	8/7/2001	6,856.90	6.72	7.70	5220	510	500	190	12	625	2600	120	0.05	42	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.48	< 0.1	< 0.05	< 0.001	< 0.1	0.043	0.4	2.4	2.8	< 0.2	< 1	< 1
EPA 28	N	9/11/2001	6,857.05	6.74	7.50	5100	520	500	186	12.1	649	2600	143	0.05	55	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.42	< 0.1	< 0.05	< 0.001	< 0.1	0.037	0.3	< 1	0.3	< 0.2	< 1	< 1
EPA 28	N	10/1/2001	6,857.25	6.86	7.40	5210	510	500	184	12.2	652	2500	148	0.05	48.8	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.4	< 0.1	< 0.05	< 0.001	< 0.1	0.0374	0.7	< 1	0.7	< 0.2	< 1	< 1
EPA 28	N	11/6/2001	6,857.25	6.75	7.60	5190	554	525	193	12.8	644	2820	143	0.05	50	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.44	< 0.1	< 0.05	< 0.001	< 0.1	0.0354	0.6	< 1	0.6	< 0.2	< 1	< 1
EPA 28	N	12/4/2001	6,857.40	6.91	7.50	5190	517	488	170	11	645	2560	123	0.05	48	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.42	< 0.1	< 0.05	< 0.001	< 0.1	0.0358	0.2	< 1	0.2	< 0.2	< 1	< 1
EPA 28	N	1/8/2002	6,857.40	6.96	7.50	5170	603	538	182	12.3	658	3010	150	< 0.05	44.8	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.43	< 0.1	< 0.05	< 0.001	< 0.1	0.036	0.6	< 1	0.6	< 0.2	< 1	< 1
EPA 28	N	2/5/2002	6,857.60	7.01	7.50	5230	586	515	193	12.2	652	2830	136	0.1	43.1	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.44	< 0.1	< 0.05	< 0.001	< 0.1	0.0291	0.7	< 1	0.7	< 0.2	< 1	< 1
EPA 28	N	3/5/2002	6,857.50	6.81	7.60	5160	549	508	208	12.4	682	2870	137	0.05	45.9	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.59	< 0.1	< 0.05	< 0.001	< 0.1	0.0519	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 28	N	4/2/2002	6,857.70	6.74	7.65	5140	572	520	206	13.6	675	2960	134	0.06	42.1	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.46	< 0.1	< 0.05	< 0.001	< 0.1	0.0397	0.7	2.2	2.9	< 0.2	< 1	< 1
EPA 28	N	5/7/2002	6,857.65	6.80	7.58	5200	546	507	210	13.1	652	2780	119	< 0.05	43.9	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.47	< 0.1	< 0.05	< 0.001	< 0.1	0.0388	0.9	< 1	0.9	< 0.2	< 1	< 1
EPA 28	N	6/4/2002	6,857.79	6.74	7.83	5150	531	485	192	11.4	656	2660	116	0.07	44.9	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.5	< 0.1	< 0.05	< 0.001	< 0.1	0.0378	< 0.2	2.5	2.5	< 0.2	< 1	< 1
EPA 28	N	7/9/2002	6,857.60	6.80	7.58	5250	549	524	202	13.1	683	2850	120	< 0.05	43.4	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.41	< 0.1	< 0.05	< 0.001	< 0.1	0.0464	0.8	< 1	0.8	< 0.2	< 1	< 1
EPA 28	N	10/8/2002	6,857.33	6.77	7.60	5190	504	480	192	11.2	675	2680	113	0.05	45.3	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.44	< 0.1	< 0.05	< 0.001	< 0.1	0.0329	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 28	N	1/7/2003	6,857.39	7.62	7.46	5130	554	536	218	9.9	694	2900	135	0.12	41.8	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.5	< 0.1	< 0.05	< 0.001	< 0.1	0.0503	0.8	3.7	4.5	< 0.2	< 1	< 1.0
EPA 28	N	4/8/2003	6,857.49	6.68	7.02	5230	529	480	205	15.5	695	2500	131	0.08	46	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.48	< 0.1	< 0.05	< 0.001	< 0.1	0.0464	< 0.2	5.3	5.3	< 0.2	< 1	< 1.0
EPA 28	N	7/7/2003	6,857.48	6.54	7.53	5090	493	471	193	13.5	689	2690	121	0.1	42	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.49	< 0.1	< 0.05	< 0.001	< 0.1	0.0401	< 0.2	< 1	0	< 0.2	< 1	< 1.0
EPA 28	N	10/7/2003	6,857.10	6.54	7.87	5270	698	544	222	12.6	677	3730	127	0.27	38.8	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.47	< 0.1	< 0.05	< 0.001	< 0.1	0.0386	0.3	< 1	0.3	< 0.2	< 1	< 1.0
EPA 28	N	1/6/2004	6,857.22	6.78	7.52	5170	537	510	196	11.7	721	2860	129	0.1	42.8 D	< 1.0	0.2	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.55	< 0.1	< 0.05	< 0.001	< 0.1	0.0394 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
EPA 28	N	4/6/2004	6,857.39	7.40	7.05	5220	539	512	175	11.4	710	2800 D	116	0.21	41.5 D	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.51	< 0.1	< 0.05	< 0.001	< 0.1	0.0421 D	< 0.2	< 1	0	< 0.2	< 1	< 1
EPA 28	N	7/13/2004	6,857.16	6.57	7.01	5300	555	508	218	12.9	708	2810 D	125	0.18	38.4 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.48	< 0.1	< 0.05	< 0.001	< 0.1	0.0403 D	0.5	< 1.0	0.5	< 0.2	< 1.0	< 1.0
EPA 28	N	10/5/2004	6,856.79	6.63	7.22	5460	528 D	498 D	224	12.2	684	2750 D	125	< 0.05	36.8 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.51	< 0.1	< 0.05	< 0.001	< 0.1	0.0368 D	0.3	< 1.0	0.3	< 0.2	< 1.0	1.2
EPA 28	N	1/4/2005	6,856.96	6.92	7.22	5280	560 D	521 D	213	11.7	702	2750 D	118	0.07	39.1 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.5	< 0.1	< 0.05	< 0.001	< 0.1	0.0445	0.6	< 1.0	0.6	< 0.2	< 1.0	2.1
EPA 28	N	4/5/2005	6,856.94	6.84	7.55	5170	554	516	214	11.9	724	2750	127	< 0.05	38.4	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.5	< 0.1	< 0.05	< 0.001	< 0.1	0.0459	0.7	< 1.0	0.7	< 0.2	< 1.0	< 1.0
EPA 28	N	7/12/2005	6,856.75	6.74	7.51	5110	595 D	534 D	207	11.8	702	2900 D	139	< 0.05	37.1 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.55	< 0.1	< 0.05	< 0.001	< 0.1	0.0418	0.6	< 1.0	0.6	< 0.2	< 1.0	1.2
EPA 28	N	10/4/2005	6,856.53	6.75	7.30	5150	544 D	513 D	215	12.2	671	2900 D	136	< 0.05	28 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.52	< 0.1	< 0.05	< 0.001	< 0.1	0.0408	0.4	1.4	1.8	< 0.2	< 1.0	1.4
EPA 28	N	1/10/2006	6,856.66	6.85	7.61	5070	508	464	209	9.9	762	2560 D	114	0.07	38.3 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.57	< 0.1	< 0.05	< 0.001	< 0.1	0.0476	< 0.2	1.5	1.5	< 0.2	< 1.0	< 1.0
EPA 28	N	4/4/2006	6,856.51	6.67	7.25	5020	571 D	533 D	210	12.4	732	2800 D	134	< 0.05	40 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.61	< 0.1	< 0.05	< 0.001	< 0.1	0.0420 D	0.6	2.4	3	< 0.2	< 1.0	< 1.0
EPA 28	N	7/18/2006	6,856.21	6.69	7.20	4940	558 D	522 D	226	12.6	669	3020 D	126	< 0.05	36.1 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.58	< 0.1	< 0.05	< 0.001	< 0.1	0.0435	0.8	3	3.8	< 0.2	< 1.0	1.3
EPA 28	N	10/3/2006	6,856.13	6.69	7.02	4990	535 D	484 D	199	11.8	672	2670 D	102	0.09	35.9 D	< 0.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.59	< 0.1	< 0.05	< 0.001	< 0.1	0.0437	0.6	< 1	0.6	< 0.2	< 1	< 1
EPA 28	N	1/9/2007	6,856.31	6.84	7.08	5190	544 D	497 D	208	12.3	738	2740 D	119	0.07	35.2 D	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.59	<0.1	<0.05	<0.001	<0.1	0.0459	0.6	<1	0.6	<0.2	<1	<1
EPA 28	N	4/10/2007	6,856.44	6.78	7.02	5160	545 D	504 D	197	13.2	744	2800 D	119	0.06	37.2 D	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.58	<0.1	<0.05	<0.001	<0.1	0.043	<0.2	<1	0	<0.2	<1	<1
EPA 28	N	7/10/2007	6,856.11	6.69	7.08	4990	577 D	521 D	216	12	767	2930 D	116	<0.05	39 D	<0.5	<0.1	0.008	<0.01	<0.005	<0.01	<0.05	0.54	<0.1	<0.05	<0.001	<0.1	0.0496	<0.2	<1	0	<0.2	<1	<1
EPA 28	N	10/2/2007	6,855.91	6.67	6.88	5040	506 D	465 D	211 D	13.3	795	2600 D	141 D	<0.05	36 D	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.7	<0.1	<0.05	<0.001	<0.1	0.0506	<0.2	<1	0	<0.2	<1	1.2
EPA 28	Dup	10/2/2007	no data	6.70	7.06	5000	493 D	460 D	221 D	12.8	719	2650 D	139 D	<0.05	29 D	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.55	<0.1	<0.05	<0.001	<0.1	0.0399	<0.2	<1	0	<0.2	<1	<1
EPA 28	N	1/15/2008	6,856.01	6.74	6.93	5190	534 D	485 D	215 D	13.6	752	2670 D	148 D	< 0.05	34.6 D	< 0.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.58	< 0.1	< 0.05	< 0.001	< 0.1	0.0429	0.6	< 1	0.6	< 0.2	< 1	< 1
EPA 28	Dup	1/15/2008	no data	6.79	6.61	5140	517 D	470 D	219 D	12.9	688	2680 D	145 D	< 0.05	28.1 D	< 0.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.5	< 0.1	< 0.05	< 0.001	< 0.1	0.0364	< 0.2	< 1	0	< 0.2	< 1	1.2
EPA 28	N	4/8/2008	6,856.16	6.65	7.08	4930	578 D	546 D	244 D	13.0 D	722	2920 D	114	< 0.1 D	48.5 D	< 0.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.6	< 0.1	< 0.05	< 0.001	< 0.1	0.0445	0.1 U	0.7 U	0.8	-0.1 U	-4.5 U	1.5
EPA 28	Dup	4/8/2008	no data	6.65	7.00	4890	566 D	535 D	248 D	12.2 D	632	3000 D	114	< 0.1 D	43.2 D	< 0.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.52	< 0.1	< 0.05	< 0.001	< 0.1	0.0398	0.2	0.5 U	0.7	-0.1 U	0 U	1.3
EPA 28	N	7/8/2008	6,855.91	6.53	7.30	4870	542	492	203 D	11	715	2830 D	121	< 0.05	32.9 D	< 0.5	< 0.1	< 0.003	< 0.01	< 0.005	< 0.01	< 0.05	0.62	< 0.1	< 0.05	< 0.001	< 0.1	0.0402	0.58	1.2 U	1.78	0.4	0.1 U	0.4 U
EPA 28	Dup	7/8/2008	no data	6.53	6.94	4790	534	478	214 D	11	653	2920 D	122	< 0.05	28.9	< 0.5	< 0.1	< 0.003	< 0.01	< 0.005	< 0.01	< 0.05	0.52	< 0.1	< 0.05	< 0.001	< 0.1	0.0351	0.68	1.3	1.98	0 U	1.3 U	0.3 U
EPA 28	N	10/7/2008	6,855.56	6.81	7.05	4990	546	478	204 D	11	785	3060 D	110	0.2	51.8	< 0.5	0.2	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.68	< 0.1	< 0.05	< 0.001	< 0.1	0.0476	0.2	1 U	1.2	-0.5 U	-0.6 U	0.6 U
EPA 28	Dup	10/7/2008	no data	6.75	7.07	4970	541	478	207 D	11	764	3060 D	110	< 0.1 D	45.2	< 0.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.63	< 0.1	< 0.05	< 0.001	< 0.1	0.0433	0.17 U	0.89 U	1.06	0.6	0.7 U	1.5
EPA 28	N	1/13/2009	6,855.46	6.73	6.89	5190	591	528	237	13	796	2770 D	113	<0.05	47.8 D	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.69	<0.1	<0.05	<0.001	<0.1	0.0459	0.28	0.68 U	0.96	-0.1 U	-2 U	1.4
EPA 28	Dup	1/13/2009	no data	no data	6.84	5140	563	496	241	12	664	2730 D	113	<0.05	35.5	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.59	<0.1	<0.05	<0.001	<0.1	0.0387	0.25	0.72 U	0.97	0.1 U	-0.6 U	1.6
EPA 28	N	4/7/2009	6,855.41	6.68	6.84	5130	517 D	465 D	229 D	11	817	2790 D	120	<0.05	34.7 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.66	<0.1	<0.05	0.001	<0.1	0.0519	0.27	1	1.27	-0.03 U	-2 U	0.9
EPA 28	Dup	4/7/2009	no data	no data	6.92	5160	527 D	486 D	236 D	11	737	2760 D	124	<0.05	32.0 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.58	<0.1	<0.05	<0.001	<0.1	0.0467	0.41	0.45 U	0.86	0.2 U	-0.8 U	0.8
EPA 28	N	7/7/2009	6,855.31	6.65	6.97	5120	536 D	480	210 D	12	799	3290 D	116	<0.05	29 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.72	<0.1	<0.05	<0.001	<0.1	0.0415	0.64	1.5	2.14	0.02 U	-0.6 U	1.3
EPA 28	Dup	7/7/2009	no data	no data	7.11	5050	518	453	215	11	670	2840 D	119	<0.05	25 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.6	<0.1	<0.05	<0.001	<0.1	0.037	0.61	1.4	2.01	0.3 U	0.2 U	1.1
EPA 28	N	10/5/2009	6,855.01	6.65	7.40	5160	515 D	476	209 D	11	824	2850 D	120	<0.05	34 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.71	<0.1	<0.05	<0.001	<0.1	0.045	0.73	1.4 U	2.13	-0.03 U	1.1 U	0.5 U
EPA 28	Dup	10/5/2009	no data	no data	7.80	5060	514	469	218	11	707	2990 D	124	<0.05	30.1 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.58	<0.1	<0.05	<0.001	<0.1	0.0406	0.68	0.71 U	1.39	0.09 U	1.9 U	0.4 U
EPA 28	N	1/5/2010	6,854.81	6.72	7.12	5220 D	516 D	474	220 D	10	861	2900 DH	145	<0.05	35 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.65	<0.1	<0.05	<0.001	<0.1	0.044	0.16 U	1.9	2.06	0.04 U	-1 U	0.8
EPA 28	Dup	1/5/2010	no data	6.70	7.06	5160 D	549 D	464	236	11	742	3070 D	124	<0.05	31 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.56	<0.1	<0.05	<0.001	<0.1	0.0392	0.15 U	1.5	1.65	-0.05 U	-0.2 U	0.9
EPA 28	N	4/6/2010	6,854.71	6.82	6.92	5180 D	574 D	520	242 D	12	889	2790 D	122	<0.05	31.8 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.63	<0.1	<0.05	<0.001	<0.1	0.0444	0.55	1.2	1.75	0.03 U	2.3 U	0.6
EPA 28	Dup	4/6/2010	no data	6.82	7.06	5150 D	540 D	487	233 D	12	770	2980 D	121	<0.05	28.6 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.57	<0.1	<0.05	<0.001	<0.1	0.0416	0.53	1.6	2.13	-0.02 U	2.1 U	0.3 U
EPA 28	N	7/13/2010	6,854.71	6.63	7.18	5240 D	553	498	232	12	854	2890 D	121 D	<0.05	31 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.59	<0.1	<0.05	0.002	<0.1	0.0451	0.26	0.65 U	0.91	0.004 U	0.6 U	0.3 U
EPA 28	Dup	7/13/2010	no data	6.63	7.28	5100 D	549	488	236	11	732	2910 D	119 D	<0.05	27 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.53	<0.1	<0.05	0.004	<0.1	0.0407	0.24	0.87 U	1.11	0.02 U	1.1 U	0.7 U
EPA 28	N	10/5/2010	6,854.46	6.76	7.68	5410 D	522	470	227	12	843	2960 D	125 D	0.07	30 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.71	<0.1	<0.05	<0.001	<0.1	0.0503	0.18	1.5	1.68	0.02 U	2.6	0.8

TABLE A.1

Southwest Alluvium Data Summary, 1989-2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
EPA 28	Dup	10/5/2010	no data	6.78	7.65	5180 D	530	462	231	11	728	2960 D	116 D	0.05	27 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.64	<0.1	<0.05	<0.001	<0.1	0.0453	0.23	1.3	1.53	0.03 U	2.2	0.5 U
EPA 28	N	1/4/2011	6,854.26	6.76	7.50	4900 D	534	474	222	11	827	2790 D	127 D	<0.05	29 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.8	<0.1	<0.05	<0.001	<0.1	0.051	0.27	1.4	1.67	0.008 U	0.08 U	1.1
EPA 28	Dup	4/4/2011	no data	6.82	7.12	5230 D	536	470	237	12	842	2720 D	123 D	<0.05	33 D	<0.50	<0.1	0.002	<0.01	<0.005	<0.01	<0.05	0.72	<0.1	<0.05	<0.001	<0.1	0.0492	0.17	1.2	1.37	0.05 U	0.4 U	1
EPA 28	N	7/12/2011	6,854.17	6.89	7.23	4930 D	541	478	234	12	837	2740 D	124 D	<0.1	32 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.76	<0.1	<0.05	<0.001	<0.1	0.0512	0.10 U	0.45 U	0.55	0.05 U	-0.4 U	0.7 U
EPA 28	Dup	7/12/2011	no data	6.86	7.41	5000 D	535	463	238	11	733	2710 D	118 D	<0.1	29 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.63	<0.1	<0.05	<0.001	<0.1	0.0445	0.07 U	-0.05 U	0.02	0.01 U	-0.4 U	1.2
EPA 28	N	10/4/2011	6,853.91	6.82	7.59	4910 D	532	466	227	11	771	2890 D	127 D	<0.1	28 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.74	<0.1	<0.05	<0.001	<0.1	0.0461	0.4	0.89 U	1.29	0.02 U	0.9 U	0.1 U
EPA 28	Dup	10/4/2011	no data	6.88	7.40	4860 D	536	458	232	11	646	2960 D	124 D	<0.1	26 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.63	<0.1	<0.05	<0.001	<0.1	0.0384	0.32	0.97 U	1.29	0.01 U	0.6 U	0.4 U
EPA 28	N	1/3/2012	6,853.80	6.88	6.95 H	4960 D	536	439	209	11	749	2710 D	126 D	<0.05	34 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.72	<0.1	<0.05	<0.001	<0.1	0.0498	0.48	0.74 U	1.96	-0.008 U	0.6 U	0.5
EPA 28	Dup	1/3/2012	no data	6.91	7.00 H	4770 D	590	477	234	13	676	2750 D	122 D	<0.05	30 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.61	<0.1	<0.05	<0.001	<0.1	0.045	0.6	0.27 U	1.14	0.02 U	0.6 U	0.6
EPA 28	N	4/3/2012	6,853.66	6.95	6.79 H	5000 D	558	451	215	12	808	2770 D	122 D	<0.05	29 D	<0.50	<0.1	<0.01	<0.01	<0.005	<0.01	<0.05	0.76	<0.1	<0.05	<0.001	<0.1	0.052	0.12 U	0.29 U	0.7	0.005 U	0.2 U	0.4 U
EPA 28	Dup	4/3/2012	no data	6.96	6.82 H	5010 D	548	442	218	12	727	2790 D	119 D	<0.05	15 D	<0.50	<0.1	<0.01	<0.01	<0.005	<0.01	<0.05	0.7	<0.1	<0.05	<0.001	<0.1	0.0459	0.41	0.84 U	2.09	0.009 U	0.8 U	0.3 U
EPA 28	N	7/10/2012	6,853.56	6.71	6.91 H	5050	537	498	227	11	798	2730 D	121 D	0.13	30 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.77	<0.1	<0.05	<0.001	<0.1	0.0468	0.51	0.78 U	2.07	0.03 U	0.3 U	0.5
EPA 28	Dup	7/10/2012	no data	6.73	6.88 H	5020	532	487	238	11	678	2780 D	117 D	0.09	27 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.66	<0.1	<0.05	0.002	<0.1	0.0396	0.55	1.4	3.35	0.008 U	0.9 U	0.5
EPA 28	N	10/9/2012	6,853.36	6.79	6.86 H	5120	576	482	231 D	12	811	2810 D	126 D	<0.05	26 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.86	<0.1	<0.05	<0.001	<0.1	0.047	0.32	-0.1 U	0.32	0.008 U	0.2 U	0.5 U
EPA 28	Dup	10/9/2012	no data	6.80	6.86 H	4980	556	460	242 D	12	674	2900 D	122 D	<0.05	23 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.72	<0.1	<0.05	<0.001	<0.1	0.0384	0.27	1.5 U	0.27	0.04 U	1	0.5 U
EPA 28	N	1/9/2013	6,853.14	6.94	6.88 H	5070	542	512	244 D	12	806	2790 D	120 D	<0.05	27 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.8	<0.1	<0.05	<0.001	<0.1	0.0499	0.87	1.4	2.27	0.03 U	0.8 U	0.8
EPA 28	Dup	1/9/2013	no data	no data	6.81 H	5070	529	503	247 D	11	668	2860 D	114 D	<0.05	24 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.66	<0.1	<0.05	<0.001	<0.1	0.0397	0.82	1.1 U	0.82	0.07 U	0.5 U	0.7
EPA 28	N	4/2/2013	6,853.29	6.83	6.88 H	5080	542	498	238	12	797	2860 D	125 D	<0.05	27 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.78	<0.1	<0.05	<0.001	<0.1	0.0474	0.33	1.4 U	0.33	0.0 U	0.3 U	0.8
EPA 28	Dup	4/2/2013	no data	no data	6.91 H	5030	539	485	243	12	688	2850 D	117 D	<0.05	24 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.66	<0.1	<0.05	<0.001	<0.1	0.0388	0.29	0.64 U	0.29	0.02 U	0.3 U	0.8
EPA 28	N	7/9/2013	6,853.02	6.70	6.92 H	5120	523	476	230	11	808	2790 D	117 D	<0.05	25 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.74	<0.1	<0.05	<0.001	<0.1	0.0481	0.27	0.80 U	0.27	0.001 U	-0.1 U	0.6
EPA 28	Dup	7/9/2013	no data	no data	6.94 H	5090	535	471	240	11	641	2860 D	109 D	<0.05	21 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	0.001	0.6	<0.1	<0.05	<0.001	<0.1	0.0357	0.37	0.51 U	0.37	0.03 U	0.6 U	1
EPA 28	N	10/1/2013	6,853.09	6.78	6.82 H	5060	518	479	228	11	817	2790 D	117 D	<0.05	26 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.74	<0.1	<0.05	<0.001	<0.1	0.049	0.49	1.9	2.39	0.1 U	0.09 U	0.2 U
EPA 28	Dup	10/1/2013	no data	6.78	6.84 H	4870	514	466	231	11	707	2810 D	110 D	<0.05	23 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.67	<0.1	<0.05	<0.001	<0.1	0.0446	0.57	1.4	1.97	0.04 U	0.08 U	0.7
EPA 28	N	1/7/2014	6,852.97	7.06	6.81	5090	505	460	225	11	793	2760	118	<0.05	24	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.79	<0.1	<0.05	<0.001	<0.1	0.0499	0.59	2.6	3.19	-0.009 U	0.2 U	0.8
EPA 28	Dup	1/7/2014	no data	no data	6.81	5030	506	457	234	11	641	2870	128	<0.05	20	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.65	<0.1	<0.05	<0.001	<0.1	0.0374	0.66	1.8	2.46	0.02 U	0.5 U	0.7 U
EPA 28	N	3/31/2014	6,852.94	6.97	6.78 H	5000	566	515	247	12	777	2720 D	119 D	<0.05	29 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.82	<0.1	<0.05	<0.001	<0.1	0.0526	0.59	0.29 U	0.59	0.04 U	0.05 U	0.8
EPA 28	Dup	3/31/2014	no data	6.98	6.81 H	5020	520	494	241 D	11	665	2840 D	117 D	<0.05	22 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.68	<0.1	<0.05	<0.001	<0.1	0.045	0.65	0.61 U	0.65	0.07 U	-1 U	0.7
EPA 28	N	7/7/2014	6,852.85	6.87	6.86 H	5010	534	462	221 D	12	777	2840 D	114 D	<0.05	26 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.79	<0.1	<0.05	<0.001	<0.1	0.0388	0.48	0.93 U	0.48	0.04 U	1.1 U	0.3 U
EPA 28	Dup	7/7/2014	no data	no data	6.85 H	4960	504	440	237 D	11	612	2900 D	107 D	<0.05	19 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.62	<0.1	<0.05	<0.001	<0.1	0.0285	0.64	0.21 U	0.64	0.007 U	0.6 U	0.2 U
EPA 28	N	10/6/2014	6,852.63	6.93	6.84 H	5010	498	461	231	11	724	2920 D	117 D	<0.05	23 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.72	<0.1	<0.05	<0.001	<0.1	0.0452	0.64	1.2 U	0.64	0.01 U	0.5 U	1
EPA 28	Dup	10/6/2014	no data	6.91	6.80 H	5090	514	482	238	11	619	2940 D	109 D	0.05	19 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.64	<0.1	<0.05	<0.001	<0.1	0.0355	0.55	1.5 U	0.55	-0.03 U	0.3 U	0.8
EPA 28	N	1/5/2015	6,852.49	7.12	6.87 H	5020	500	462	255	11	437	2930 D	100 D	<0.05	12 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.15	<0.1	<0.05	<0.001	<0.1	0.0279	0.66	0.65 U	0.66	-0.004 U	0.8 U	1.7 U
EPA 28	Dup	1/5/2015	no data	7.09	6.88 H	5030	500	456	247	11	455	2910 D	102 D	<0.05	14 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.54	<0.1	<0.05	<0.001	<0.1	0.0256	0.52	0.76 U	0.52	0.04 U	0.7 U	3.1
EPA 28	N	4/6/2015	6,852.50	6.82	6.78 H	5090	526	480	227	11	715	3020 D	129 D	<0.05	12.7 D	<0.5	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.74	<0.1	<0.05	<0.001	<0.1	0.0403	0.71	1.4	2.11	0.04 U	0.5 U	3.4
EPA 28	Dup	4/6/2015	no data	6.83	6.81 H	5070	514	477	238	11	588	3090 D	123 D	<0.05	17 D	<0.5	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.63	<0.1	<0.05	<0.001	<0.1	0.0308	0.78	0.95 U	0.78	-0.01 U	-0.08 U	3.9
EPA 28	N	7/6/2015	6,852.32	6.75	6.76 H	5110	486	439	230	11	454	3150 D	107 D	0.15	13 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.41	<0.1	<0.05	<0.001	<0.1	0.022	0.54	2.3	2.84	0.07 U	0.4 U	1 U
EPA 28	Dup	7/6/2015	no data	6.74	6.78 H	5070	502	444	237	11	461	3140 D	107 D	<0.05	10.6 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.55	<0.1	<0.05	<0.001	<0.1	0.0215	0.45	2	2.45	0.2 U	0.8 U	2.1
EPA 28	N	10/5/2015	6,852.13	6.93	6.83 H	4990	479	455	238	11	389	2840 D	106 DH	<0.05	8 D	<0.50	<0.1	0.001	<0.001	<0.005	<0.01	<0.001	0.43	<0.1	<0.05	<0.001	<0.1	0.0157	0.59	0.60 U	0.59	0.005 U	0.7 U	4
EPA 28	Dup	10/5/2015	no data	6.90	6.84 H	5000	488	461	243	11	416	3090 D	106 D	<0.05	9 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.51	<0.1	<0.05	<0.001	<0.1	0.0168	0.66	1.9	2.56	0.01 U	0.4 U	5.5
EPA 28	N	1/4/2016	6,852.03	6.95	6.82 H	5020	487	461	239	10	425	3140 D	101 D	<0.05	8.7 D	<0.50	0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.49	<0.1	<0.05	<0.001	<0.1	0.0156	0.61	2	2.61	0.01 U	-0.5 U	2
EPA 28	Dup	1/4/2016	no data	6.97	6.84 H	4970	497	464	244	11	424	3150 D	101 D	<0.05	8.8 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.5	<0.1	<0.05	<0.001	<0.1	0.0149	0.66	2.6	3.26	0.02 U	0.4 U	2.4
EPA 28	N	4/4/2016	6,851.76	6.81	6.97 H	5010	495	464	252	11	404	3060 D	96 D	<0.05	8.1 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.5	<0.1	<0.05	<0.001	<0.1	0.0192	0.57	2.7	3.27	0.04 U	0.3 U	2.7
EPA 28	Dup	4/4/2016	no data	6.78	6.95 H	5000	494	464	255	11	400	3080 D	97 D	<0.05	8.3 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.5	<0.1	<0.05	<0.001	<0.1	0.0193	0.71	0.79 U	0.71	0.04 U	-0.3 U	3.3
EPA 28	N	7/11/2016	6,851.72	6.84	6.90 H	4970 D	494	460	252	11	408	2950 D	99 D	<0.05	8.8 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.25	<0.1	<0.05	<0.001	<0.1	0.0205	0.35	3.4	3.75	0.2	0.8 U	1.2 U
EPA 28	Dup	7/11/2016	no data	6.84	6.85 H	4980 D	493	464	251	11	413	3010 D	102 D	<0.05	8.7 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.46	<0.1	<0.05	<0.001	<0.1	0.0178	0.33	1.7	2.03	0.05 U	0.6 U	1.1 U
EPA 28	N	10/3/2016	6,851.55	7.01	6.91 H	5010 H	490	466	252	11	403	3290 D	101 D	<0.05	8.1 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.47	<0.1	<0.05	<0.001	<0.1	0.0171	0.37	2.5	2.87	0.09	-0.3 U	3.3
EPA 28	Dup	10/3/2016	no data	7.05	6.91 H	4970 H	489	461	247	11	416	3190 D	99 D	<0.05	8.0 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.44	<0.1	<0.05	<0.001	<0.1	0.0177	0.52	1.3	1.82	0.1 U	0.1 U	2.1
EPA 28	N	1/9/2017	6,851.31	6.99	6.95 H	4900 D	469	473	256	11	410	3180 D	102 D	<0.05	8.1 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.51	<0.1	<0.05	<0.001	<0.1	0.0179	0.43	0.31 U	0.43	0.3	0.4 U	1.8
EPA 28	Dup	1/9/2017	no data	7.02	6.93 H	4890 D	464	467	256	12	416	3190 D	102 D	<0.05	7.9 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.55	<0.1	<0.05	<0.001	<0.1	0.0189	0.57	0.86 U	0.57	0.1 U	0.3 U	1.1 U
EPA 28	N	4/3/2017	6,851.12	6.84	6.94 H	4860 D	479	429	240 D	11	419	3170 D	100 D	<0.05	7.8 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.52	<0.1	<0.05	<0.001	<0.1	0.0179	0.3	1.3	1.6	0.06 U	-0.6 U	1.2 U
EPA 28	Dup	4/3/2017	no data	6.82	6.88 H	4890 D	474	422	232 D	10	431	3070 D	101 D	<0.05	7.6 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.46	<0.1	<0.05	<0.001	<0.1	0.0189	0.4	3.6	4	0.003 U	-0.4 U	1.0 U
EPA 28	N	7/10/2017	6,850.95	6.83	6.89 H	4920 D	491	463	252 D	10	412	2930 D	98 D	<0.05	7.10 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.51	<0.1	<0.05	<0.001	<0.1	0.0183	0.2	1.4 U	0.2	0.1 U	-0.02 U	0.6
EPA 28	Dup	7/10/2017	no data	6.83	6.88 H	4910 D	515	473	260 D	11	417	2930 D	97 D	<0.05	7.35 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.51	<0.1	<0.05	<0.001	<0.1	0.0204	0.4	-0.002 U	0.4	-0.01 U	0.8 U	0.3 U
EPA 28	N	10/2/2017	6,850.64	6.88	6.93 H	4830 D	491	469	252	10	432	2900 D	98 D	<0.05	7.05 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.46	<0.1	<0.05	<0.001	<0.1	0.0211	0.3	0.3 U	0	0.02 U	0.4 U	1
EPA 28	Dup	10/2/2017	no data	6.86	6.88 H	4950 D	482	463	249	10	440	2890 D	98 D	<0.05	7.20 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.49	<0.1	<0.05	<0.001	<0.1	0.0218	0.5	1.5	2	0.04 U	-0.5 U	0.7
EPA 28	N	1/8/2018	6,850.40	7.00	6.89 H	4960 D	512	462	236 D	10	394	3210 D	100 D	<0.05	6.85 D	<0.50	0.03	<0.001	<0.001	<0.001	<0.005	<0.001	0.628 D	<0.001	0.009	<0.001	<0.01	0.0211	0.3	-0.3 U	0.3	0.2 U	0.03 U	0.8
EPA 28	Dup	1/8/2018	no data	7.01	6.93 H	4950 D	502	457	271 D	10	398	3210 D	102 D	<0.05	6.90 D	<0.50	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	0.523 D	<0.001	0.008	<0.001	<0.01	0.0223	0.4	0.1 U	0.4	0.05 U	0.2 U	1.1
EPA 28	N	4/2/2018	6,850.39	6.94	6.87 H	4970 D	541 D	409	236	10	406	3230 D	103 D	<0.05	6.90 D	<0.50	0.03	<0.001	<0.001	<0.001	<0.005	<0.001	0.59	<0.001	0.008	<0.001	<0.01	0.0213	0.7	1.5	2.2	0.1 U	1.1 U	1.2
EPA 28	Dup	4/2/2018	no data	6.85	6.86 H	4960 D	535 D	415	240	10	416	3250 D	105 D	<0.05	6.75 D	<0.50	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	0.511	<0.001	0.008	<0.001	<0.01	0.0211	0.7	1.6	2.3	0.1 U	0.4 U	1.1

TABLE A.1
Southwest Alluvium Data Summary, 1989-2019
United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
EPA 28	N	7/9/2018	6,850.09	6.86	6.91 H	4940 D	479	427	234	9	414	3000 D	95 D	<0.05	6.85 D	<0.50	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	0.522	<0.001	0.01	<0.001	<0.01	0.0198	0.6	2.2	2.8	0.02 U	1.1 U	1.4
EPA 28	Dup	7/9/2018	no data	6.89	6.88 H	5020 D	485	421	231	12 D	416	2970 D	95 D	<0.05	6.95 D	<0.50	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	0.461	<0.001	0.009	0.001	<0.01	0.0211	0.7	2.2	2.9	0.01 U	0.5 U	0.6 U
EPA 28	N	10/1/2018	6,849.74	6.96	6.87 H	5070 D	499	442	260 D	12	416	3210 D	99 D	<0.05	6.00 D	<0.50	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	0.493	<0.001	0.009	<0.001	<0.01	0.0189	0.6	0.7 U	0.6	0.03 U	0.5 U	1.2
EPA 28	Dup	10/1/2018	no data	6.97	6.91 H	5040 D	499	433	247 D	11	424	3170 D	101 D	<0.05	6.40 D	<0.50	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	0.41	<0.001	0.008	<0.001	<0.01	0.0204	0.6	1.7 U	0.6	0.09 U	0.6 U	1.2
EPA 28	N	1/7/2019	6,849.49	6.99	6.92 H	4960 D	511	470	263 D	12	422	3120 D	94 D	<0.05	5.45 D	<0.50	<0.03	no data	<0.001	<0.001	<0.005	<0.001	0.282	<0.001	0.005	no data	<0.01	0.02	0.4	-0.2 U	0.02	0.07 U	-0.4 U	1.6
EPA 28	Dup	1/7/2019	6,849.07	6.99	6.91 H	4960 D	519	474	266 D	12	427	3140 D	96 D	<0.05	5.2 D	<0.50	<0.03	no data	<0.001	<0.001	<0.005	<0.001	0.458	<0.001	0.008	no data	<0.01	0.0198	0.4	1.1 U	1.5	-0.009 U	0.1 U	1.8
EPA 28	N	4/8/2019	6,849.46	6.88	6.85 H	5020 D	505	419	240	11	422	3180 D	97 D	<0.05	4.74 D	<0.50	<0.03	0.002	<0.001	<0.001	<0.005	<0.001	0.51	<0.001	0.012	<0.001	<0.01	0.0202	0.5	0.2 U	0.7	0.03 U	0.07 U	0.3 U
EPA 28	Dup	4/8/2019	6,848.98	6.68	6.87 H	5010 D	515	462	258	10	434	3220 D	103 D	<0.05	5.15 D	<0.50	<0.03	0.002	<0.001	<0.001	<0.005	<0.001	0.496	<0.001	0.011	<0.001	<0.01	0.0197	0.5	1.5 U	2	0.002 U	0.6 U	0.5 U
EPA 28	N	7/15/2019	6,849.36	6.91	6.9 H	4990 D	466	427	225	9	430	3080 D	95 D	<0.05	4.54	<0.50	<0.03	<0.001	<0.001	<0.001	<0.005	0.003	0.599 D	<0.001	0.009	<0.001	<0.01	0.0203	0.5	0.6 U	1.1	-0.009 U	0 U	0.9
EPA 28	Dup	7/15/2019	6,848.95	6.92	6.91 H	4970 D	470	431	231	10	441	3060 D	95 D	<0.05	4.45	<0.50	0.04	<0.001	<0.001	0.003	<0.005	0.005	0.491 D	<0.001	0.017	<0.001	<0.01	0.0207	0.6	0.3 U	0.9	0.01 U	0.4 U	1
EPA 28	N	10/9/2019	6,849.01	7.01	6.97 H	5020 DH	505	465	257	11	425	3200 D	98 D	<0.05	3.47 D	<0.50	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	0.476 D	<0.001	0.012	<0.001	<0.01	0.0203	0.5	0.6 U	1.1	0.006 U	-0.2 U	0.8
EPA 28	Dup	10/9/2019	6,848.58	6.97	7.03 H	5000 DH	502	461	253	11	432	3180 D	102 D	<0.05	3.56 D	<0.50	0.05	<0.001	<0.001	<0.001	<0.005	<0.001	0.5 D	<0.001	0.01	<0.001 D	<0.01	0.0214	0.6	0.6 U	1.2	0.1	0.3 U	1.1
GW 1	N	7/19/1989	6,869.00	6.90	7.32	5134	910	412	328	2.7	1415	2042	220	0.08	120	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.05	< 0.05	0.05	< 0.1	< 0.05	0.002	< 0.1	0.0954	0.6	< 1	0.6	< 0.2	1.7	5.9
GW 1	N	10/16/1989	6,868.90	7.00	7.02	5376	856	431	331	3.8	2030	1931	236	0.13	110	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.08	< 0.1	< 0.05	0.001	< 0.1	0.0979	0.4	< 1	0.4	4	1.5	3.7
GW 1	N	1/10/1990	6,868.30	6.40	6.54	5658	774	408	349	2.81	1903	2079	239	0.25	111	< 1	< 0.1	0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.09	< 0.1	< 0.05	0.002	< 0.1	0.09	1	1.1	2.1	< 0.2	1.3	1.2
GW 1	N	4/5/1990	6,868.20	6.30	6.98	5732	818	430	350	2.8	2001	2118	243	0.13	119	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.1	< 0.1	< 0.05	0.002	< 0.1	0.087	0.5	< 1	0.5	< 0.2	1.2	0.8
GW 1	N	7/3/1990	6,867.20	6.40	6.92	6154	953	501	343	4.5	2098	2252	241	< 0.05	109	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.01	< 0.05	0.1	< 0.1	< 0.05	0.001	< 0.1	0.116	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	10/3/1990	6,867.60	6.30	7.26	5879	780	425	350	4	1785	2214	238	< 0.05	68.3	< 1	< 0.1	0.003	< 0.05	0.01	0.03	< 0.05	0.12	< 0.1	< 0.05	0.001	< 0.1	0.08	0.7	< 1	0.7	< 0.2	< 1	< 1
GW 1	N	1/16/1991	6,867.60	6.40	7.12	6092	909	483	380	3.3	1573	2373	247	< 0.05	97.5	< 1	0.18	< 0.001	< 0.01	< 0.01	0.02	< 0.05	0.12	< 0.1	< 0.05	0.001	< 0.1	0.111	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	4/2/1991	6,867.70	6.30	7.10	5780	817	459	344	3.5	1478	2476	237	0.05	108	< 1	0.19	< 0.001	< 0.01	0.01	0.02	< 0.05	0.13	< 0.1	< 0.05	0.001	< 0.1	0.13	0.4	< 1	0.4	< 0.2	< 1	< 1
GW 1	N	7/17/1991	6,866.80	6.50	7.21	6236	821	478	326	4.8	1893	2626	236	< 0.05	90.9	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.15	< 0.1	< 0.05	0.002	< 0.1	0.104	0.2	< 1	0.2	< 0.2	2.3	< 1
GW 1	N	10/15/1991	6,866.10	6.30	6.90	6275	900	519	349	3.8	2020	2460	247	< 0.05	57.6	< 1	0.36	< 0.001	< 0.01	< 0.01	0.01	< 0.05	0.12	< 0.1	< 0.05	< 0.001	< 0.1	0.15	0.3	4.6	4.9	< 0.2	< 1	< 1
GW 1	N	1/15/1992	6,865.90	6.30	7.05	5446	695	457	360	3.9	1617	2445	239	< 0.05	78.2	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.01	< 0.05	0.13	< 0.1	< 0.05	< 0.001	< 0.1	0.105	0.3	< 1	0.3	< 0.2	< 1	< 1
GW 1	N	4/8/1992	6,865.70	6.20	7.43	4775	769	481	364	4.4	1813	2538	217	0.08	75.8	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.12	< 0.1	< 0.05	< 0.001	< 0.1	0.094	< 0.2	1.1	1.1	< 0.2	< 1	< 1
GW 1	N	7/8/1992	6,864.80	6.00	7.37	4964	801	403	454	5.6	1610	2493	231	0.13	115	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.11	< 0.1	< 0.05	0.001	< 0.1	0.07	0.2	1.8	2	< 0.2	2.2	< 1
GW 1	N	10/6/1992	6,863.70	6.30	6.90	6008	800	504	389	3.2	1809	2370	220	< 0.05	110	< 1	0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.13	< 0.1	< 0.05	0.007	< 0.1	0.049	0.8	< 1	0.8	< 0.2	1.2	< 1
GW 1	N	1/7/1993	6,863.40	6.40	7.73	5223	676	421	348	5.3	1807	2206	234	0.06	117	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.11	< 0.1	< 0.05	0.007	< 0.1	0.097	0.3	2.6	2.9	< 0.2	< 1	< 1
GW 1	N	4/7/1993	6,863.90	6.40	7.22	5681	681	401	372	5.6	1579	2269	199	< 0.05	119	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.14	< 0.1	< 0.05	0.002	< 0.1	0.1	3.5	< 1	3.5	< 0.2	2.2	3.9
GW 1	N	7/14/1993	6,862.70	6.40	7.23	5630	807	438	337	4.3	1610	2370	211	0.05	118	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.14	< 0.1	< 0.05	0.004	< 0.1	0.099	< 0.2	1.7	1.7	< 0.2	3.3	< 1
GW 1	N	10/7/1993	6,862.20	6.70	7.29	5196	719	433	310	3	1792	1952	228	< 0.05	124	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.13	< 0.1	< 0.05	0.005	< 0.1	0.075	0.7	3.7	4.4	< 0.2	< 1	< 1
GW 1	N	1/6/1994	6,861.80	6.80	7.38	5051	704	394	335	2.9	1635	2075	218	0.11	101	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.11	< 0.1	< 0.05	< 0.001	< 0.1	0.069	3.3	3.5	6.8	< 0.2	< 1	9.5
GW 1	N	4/12/1994	6,861.60	6.70	7.15	5216	685	409	316	3.9	1485	2256	175	0.3	115	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.1	< 0.1	< 0.05	0.001	< 0.1	0.089	0.4	1.5	1.9	< 0.2	1.9	2.8
GW 1	N	7/21/1994	6,861.10	6.70	6.97	5415	828	417	283	5.3	1519	2371	185	0.13	118	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.12	< 0.1	< 0.05	0.001	< 0.1	0.082	1.2	< 1	1.2	< 0.2	1.1	1.4
GW 1	N	10/5/1994	6,860.70	6.50	7.45	5567	745	446	323	5.1	13.55	2250	177	0.23	111	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.09	< 0.1	< 0.05	0.001	< 0.1	0.082	0.2	< 1	0.2	< 0.2	3.1	< 1
GW 1	N	1/4/1995	6,860.50	6.50	7.39	5732	788	441	295	4.7	1364	2483	166	0.72	104	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.11	< 0.1	< 0.05	< 0.001	< 0.1	0.069	1	2.3	3.3	< 0.2	< 1	4.6
GW 1	N	4/5/1995	6,860.30	6.60	7.03	5397	698	420	282	3.9	1443	2400	186	0.36	110	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.09	< 0.1	< 0.05	< 0.001	< 0.1	0.074	2.2	1.7	3.9	< 0.2	< 1	4.9
GW 1	N	7/6/1995	6,859.90	6.50	7.65	5180	665	428	285	3.9	1183	2255	170	0.1	99.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.01	< 0.1	< 0.05	0.002	< 0.1	0.0623	0.4	< 1	0.4	< 0.2	< 1	< 1
GW 1	N	10/3/1995	6,859.30	6.60	7.53	5292	640	419	270	3.2	1218	2265	137	0.29	105	< 1	< 0.1	0.003	< 0.01	< 0.01	< 0.01	< 0.05	0.02	< 0.1	< 0.05	0.019	< 0.1	0.0559	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	1/3/1996	6,858.90	6.60	6.80	5086	605	405	274	3.5	1211	2079	135	0.07	115	< 1	< 0.1	0.002	< 0.01	< 0.01	< 0.01	< 0.05	0.07	< 0.1	< 0.05	0.027	< 0.1	0.058	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	4/2/1996	6,858.60	6.60	7.55	5078	594	388	274	3.7	1160	2162	140	0.09	116	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	< 0.001	< 0.1	0.05	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	7/7/1996	6,858.40	6.30	7.08	5119	605	395	290	3.6	1169	2155	160	0.21	109	1.04	< 0.1	0.002	< 0.01	< 0.01	< 0.01	< 0.05	0.07	< 0.1	< 0.05	0.006	< 0.1	0.06	0.3	< 1	0.3	< 0.2	< 1	< 1
GW 1	N	10/1/1996	6,858.40	6.50	6.99	5080	624	422	264	3.9	1170	2063	158	0.1	116	< 1	< 0.1	0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.07	< 0.1	< 0.05	0.002	< 0.1	0.051	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	1/22/1997	6,858.10	6.40	7.36	4790	625	415	266	4.16	1130	2003	148	0.1	107	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.04	< 0.1	< 0.05	< 0.001	< 0.1	0.043	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	4/8/1997	6,858.30	6.60	7.90	4830	636	403	241	4.2	1080	2047	173	0.24	117	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.06	< 0.1	< 0.05	0.015	< 0.1	0.049	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	7/8/1997	6,857.70	6.90	7.68	4800	634	379	229	4.4	1040	2050	173	0.3	116	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.048	0.4	< 1	0.4	< 0.2	< 1	< 1
GW 1	N	10/7/1997	6,857.80	6.30	7.35	4750	619	364	245	4.7	1070	1980	145	0.38	114	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.054	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	1/15/1998	6,857.50	6.80	7.90	4650	616	349	251	5.6	1020	2100	157	0.71	112	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.07	< 0.1	< 0.05	< 0.001	< 0.1	0.0539	1	< 1	1	< 0.2	< 1	< 1
GW 1	N	4/7/1998	6,857.50	6.60	7.48	4440	597	331	220	4.2	872	2000	121	0.13	97.9	< 1	< 0.1	0.002	< 0.01	< 0.005	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.046	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	7/7/1998	6,857.50	6.80	7.70	4350	587	317	224	4.8	815	1800	132	0.37	122	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.0464	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	10/6/1998	6,857.00	6.72	7.88	4370	632	331	228	5.7	801	2020	125	0.06	95.9	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.05	< 0.2	< 1	0	< 0.2	1.2	1.2
GW 1	N	1/5/1999	6,856.90	6.70	7.75	4450	597	304	197	5.4	853	1830	124	0.29	91.5	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.0509	1.2	< 1	1.2	< 0.2	< 1	< 1
GW 1	N	4/6/1999	6,856.80	6.70	7.65	4300	610	264	209	5.1	738	1820	115	0.43	91.8	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.0461	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	7/13/1999	6,857.06	6.70	7.80	4190	611	304	183	9.7	770	1900	125	0.47	82.4	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.02	< 0.1	< 0.05	0.001	< 0.1	0.046	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	10/5/1999	6,857.60	6.75	7.53	4230	562	270	205	5.1	788	1670	120	0.1	91	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.0507	0.4	< 1	0.4	< 0.2	< 1	< 1
GW 1	N	1/4/2000	6,857.00	6.70	7.72	4160	589	278	176	6	742	1790	114	0.28	94.2	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.03	< 0.1	< 0.05	0.001	< 0.1	0.051	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	5/9/2000	6,856.30	6.60	7.69	4410	585	309	226	5.1	919	1870	122	0.84	87	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.04	< 0.1	< 0.05	< 0.001	< 0.1	0.061	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	7/17/2000	6,856.20	6.63	7.58	4370	609	312	210	4.88	915	1720	125	0.77	77.5	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.04	< 0.1	< 0.05	< 0.001	< 0.1	0.0572	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	10/9/2000	6,855.85	6.88	7.53	4260	517	274	200	5.8	905	1520	95.1	0.88	75.7	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.06	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	1/8/2001	6,856.00	6.73	7.75	4290	628	316	196	5.2	944	1830	112	0.76	79.9	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.04	< 0.1	< 0.05	0.001	< 0.1	0.063	< 0.2	5.1	5.1	< 0.2	< 1	< 1

TABLE A.1

Southwest Alluvium Data Summary, 1989-2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
GW 1	N	2/5/2001	6,856.20	6.91	7.44	4270	721	352	184	6.1	960	2110	114	0.77	73.7	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.068	0.3	< 1	0.3	< 0.2	< 1	< 1
GW 1	N	3/5/2001	6,856.50	7.15	7.40	4080	635	323	166	6.1	975	2070	104	0.79	74.2	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.0671	< 0.2	3.9	3.9	< 0.2	< 1	< 1
GW 1	N	4/4/2001	6,856.70	7.00	7.50	4360	713	347	201	4.1	946	2070	116	0.79	84.7	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.068	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	5/8/2001	6,856.80	6.72	7.51	4500	628	314	201	4.7	944	1830	124	0.79	78.2	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.075	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	6/4/2001	6,857.05	6.67	6.98	4420	635	322	187	4.7	944	1980	119	0.83	76.4	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	0.009	< 0.1	0.065	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	7/10/2001	6,857.10	7.12	7.47	4680	694	353	197	4.1	892	2110	134	0.8	86.7	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.0731	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	8/7/2001	6,857.12	6.61	7.50	4910	650	340	210	4.5	878	2100	140	0.69	84	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.081	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	9/11/2001	6,857.25	6.64	7.40	4960	690	350	214	4.6	899	2200	140	0.68	101	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.04	< 0.1	< 0.05	< 0.001	< 0.1	0.0764	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	10/1/2001	6,857.40	6.73	7.80	5190	690	350	206	5.3	913	2200	170	0.63	91.5	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.04	< 0.1	< 0.05	< 0.001	< 0.1	0.0903	0.2	< 1	0.2	< 0.2	< 1	< 1
GW 1	N	11/5/2001	6,857.50	6.68	7.20	5260	775	386	219	5.1	950	2540	150	0.59	95	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.04	< 0.1	< 0.05	< 0.001	< 0.1	0.0872	0.4	< 1	0.4	< 0.2	< 1	< 1
GW 1	N	12/4/2001	6,857.65	6.83	7.30	5300	722	361	197	4.4	984	2270	145	0.64	96	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.04	< 0.1	< 0.05	< 0.001	< 0.1	0.0957	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	Dup	12/4/2001	no data	6.87	7.40	5260	716	351	219	3.9	946	2250	137	0.46	96	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.03	< 0.1	< 0.05	< 0.001	< 0.1	0.095	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	1/8/2002	6,857.70	6.89	7.20	5310	841	408	173	6.9	991	2650	157	0.59	82	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.04	< 0.1	< 0.05	< 0.001	< 0.1	0.0976	0.3	< 1	0.3	< 0.2	< 1	< 1
GW 1	Dup	1/8/2002	no data	6.90	7.30	5260	844	401	176	6.8	978	2660	159	0.51	81.5	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.04	< 0.1	< 0.05	< 0.001	< 0.1	0.102	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	2/4/2002	6,857.75	6.87	7.40	5360	808	398	206	6.2	1010	2530	167	0.59	80.5	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.04	< 0.1	< 0.05	< 0.001	< 0.1	0.0926	< 0.2	1.8	1.8	< 0.2	< 1	< 1
GW 1	N	3/4/2002	6,857.75	6.70	7.30	5360	764	408	260	4.4	1080	2630	151	0.6	92.2	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.108	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	4/1/2002	6,857.90	6.65	7.38	5470	791	419	240	6.2	1100	2620	162	0.58	83.2	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.102	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	5/6/2002	6,857.95	6.63	7.56	5490	763	418	245	5.8	1110	2450	160	0.56	91	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	0.05	< 0.001	< 0.1	0.114	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	Dup	5/6/2002	no data	6.70	7.67	5470	770	409	248	5.6	1100	2440	158	0.46	93.2	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.04	< 0.1	0.05	< 0.001	< 0.1	0.102	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	6/3/2002	6,857.97	6.58	7.61	5530	755	423	230	4.3	1150	2400	150	0.57	96	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.108	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	7/8/2002	6,857.75	6.65	7.80	5630	753	454	190	6.6	1200	2500	140	0.54	99.9	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.04	< 0.1	< 0.05	< 0.001	< 0.1	0.128	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	10/8/2002	6,857.52	6.75	7.72	5850	708	460	241	4	1300	2320	170	0.42	113	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.04	< 0.1	< 0.05	< 0.001	< 0.1	0.093	0.6	< 1	0.6	< 0.2	< 1	< 1
GW 1	N	1/6/2003	6,857.61	7.38	7.61	5980	768	544	302	6.7	1390	2620	166	0.94	119	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.116	< 0.2	< 1	0	< 0.2	< 1	< 1.0
GW 1	N	4/7/2003	6,857.81	6.57	7.27	6050	704	504	288	5.9	1360	2280	209	0.41	124	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.0963	< 0.2	< 1	0	< 0.2	< 1	< 1.0
GW 1	Dup	4/7/2003	no data	no data	7.24	6000	696	495	291	5.7	1380	2250	206	0.4	134	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.11	0.4	< 1	0.4	< 0.2	< 1	< 1
GW 1	N	7/7/2003	6,857.66	6.37	7.28	5400	678	514	261	7	1380	2550	192	0.39	129	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.0885	< 0.2	< 1	0	< 0.2	< 1	< 1.0
GW 1	N	10/6/2003	6,857.34	6.39	7.74	6150	743	583	319	4.7	1520	2740	223	0.59	102	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.105	< 0.2	< 1	0	< 0.2	< 1	< 1.0
GW 1	N	1/6/2004	6,857.47	6.64	7.65	6120	707	566	293	5.8	1480	2670	252	0.36	106 D	< 1.0	0.2	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.06	< 0.1	< 0.05	< 0.001	< 0.1	0.0891 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
GW 1	N	4/5/2004	6,857.63	6.94	6.98	6270	700	570	302	5.9	1480	2650 D	221	0.43	117 D	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	0.001	< 0.1	0.0867 D	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	7/12/2004	6,857.41	6.39	6.97	6610	715	563	354	6.4	1420	2630 D	228	0.41	124 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.0888 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
GW 1	N	10/4/2004	6,857.00	6.45	7.13	6800	699 D	572 D	354	5.8	1570	2590 D	249	0.23	93 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.0870 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
GW 1	N	1/3/2005	6,857.13	6.70	7.09	6400	711 D	575 D	350	5.8	1570	2510 D	224	0.28	89 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.06	< 0.1	< 0.05	< 0.001	< 0.1	0.0914	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
GW 1	N	4/4/2005	6,857.29	6.64	7.25	6250	716	579	350	5.4	1560	2680	222	0.22	88	< 1.0	0.2	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.07	< 0.1	< 0.05	< 0.001	< 0.1	0.0874	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
GW 1	N	7/11/2005	6,856.92	6.56	7.40	6360	780 D	648 D	344	5.7	1480	2900 D	247	0.43	92 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.06	< 0.1	< 0.05	< 0.001	< 0.1	0.0874	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
GW 1	N	10/4/2005	6,856.60	6.63	7.24	6420	711 D	595 D	352	6.3	1560	2770 D	267	0.23	85 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.0934	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
GW 1	N	1/9/2006	6,856.61	6.78	7.56	6230	615	564 D	339	5.1	1620	2320 D	213	0.42	77 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.04	< 0.1	< 0.05	< 0.001	< 0.1	0.0889	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
GW 1	N	4/3/2006	6,856.71	6.53	7.30	6490	764 D	646 D	335	6.9	1580	2800 D	262	0.34	106 D	< 1.0	0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.04	< 0.1	< 0.05	< 0.001	< 0.1	0.0855 D	< 0.2	1.2	1.2	< 0.2	< 1.0	< 1.0
GW 1	N	7/18/2006	6,856.36	6.57	7.05	6310	736 D	625 D	386	7.6	1580	2990 D	244	0.28	111 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.04	< 0.1	< 0.05	< 0.001	< 0.1	0.0954	0.2	3	3.2	< 0.2	< 1.0	< 1.0
GW 1	N	10/3/2006	6,856.26	6.60	6.91	6330	665 D	581 D	353 D	7.2	1280	2660 D	192	0.4	96 D	0.61	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.04	< 0.1	< 0.05	< 0.001	< 0.1	0.0914	< 0.2	1.3	1.3	< 0.2	< 1	< 1
GW 1	N	1/9/2007	6,856.44	6.91	6.85	6680	698 D	604 D	333	8.1	1550	2830 D	223	0.38	99 D	0.64	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.04	<0.1	<0.05	<0.001	<0.1	0.0936	0.3	<1	0.3	<0.2	<1	<1
GW 1	N	4/9/2007	6,856.61	6.74	6.95	6180	704 D	604 D	339	8.5	1610	2850 D	238	0.38	111 D	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.04	<0.1	<0.05	<0.001	<0.1	0.0964	<0.2	<1	0	<0.2	<1	<1
GW 1	N	7/9/2007	6,856.26	6.59	6.98	6500	733 D	655 D	383	7.2	1640	3070 D	207	0.38	108 D	0.8	<0.1	0.01	<0.01	<0.005	<0.01	<0.05	0.03	<0.1	<0.05	<0.001	<0.1	0.104	<0.2	<1	0	<0.2	<1	<1
GW 1	N	10/2/2007	6,855.99	6.67	6.70	6610	645 D	593 D	377 D	7.7	1660	2720 D	255 D	0.36	96 D	0.84	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.04	<0.1	<0.05	<0.001	<0.1	0.101	<0.2	<1	0	1	<1	<1
GW 1	N	1/14/2008	6,855.96	6.69	6.68	6800	714 D	645 D	393 D	8.1	1630	2870 D	270 D	0.46	93 D	0.9	0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.0929 D	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 1	N	4/7/2008	6,856.31	6.61	7.01	6440	749 D	692 D	423 D	9.8 D	1620	3180 D	224	0.5 D	160 D	1.48	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.05	< 0.1	< 0.05	< 0.001	< 0.1	0.11	0.1 U	-0.1 U	0	0.2	-4.5 U	1.1
GW 1	N	7/7/2008	6,856.01	6.42	6.87 H	6480 H	714	636	374 D	7	1680	3160 D	234	0.41	152 D	1.56	< 0.1	< 0.003	< 0.01	< 0.005	< 0.01	< 0.05	0.04	< 0.1	< 0.05	< 0.001	< 0.1	0.0967	-0.02 U	1.1 U	1.08	-0.1 U	2.7 U	0.9
GW 1	N	10/6/2008	6,855.56	6.42	6.92	6650	705	633	378 D	7	1710	3310 D	223	0.5	102 D	1.51	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.04	< 0.1	< 0.05	< 0.001	< 0.1	0.102	0.07 U	0.14 U	0.21	-0.1 U	-1 U	1.5
GW 1	N	1/12/2009	6,855.51	6.43	6.80	7080	696	658	401	7	1810	2820 D	208	0.26	130 D	1.65	0.2	<0.001	<0.01	<0.005	<0.01	<0.05	0.03	<0.1	<0.05	<0.001	<0.1	0.0564	0.04 U	1.1 U	1.14	-0.3 U	-4 U	1.2
GW 1	N	4/6/2009	6,855.46	6.53	6.67	6750	682 D	659 D	413 D	6	1850	3170 D	226	0.32	103 D	1.59	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.06	<0.1	<0.05	<0.001	<0.1	0.101	0.14	1	1.14	-0.03 U	-1 U	0.3 U
GW 1	N	7/6/2009	6,855.41	6.45	6.76	6890 H	734 D	668	387 D	6	1790	3670 D	237	0.48	97 D	1.7	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.06	<0.1	<0.05	<0.001	<0.1	0.113	0.29	1.3	1.59	0.1 U	-2 U	2.8
GW 1	N	10/6/2009	6,854.86	6.43	6.98	6640	717 D	645	385 D	7	1870	3340 D	237	0.62	97 D	2.08	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.05	<0.1	<0.05	<0.001	<0.1	0.104	0.4	0.58 U	0.98	-0.05 U	-1 U	0.2 U
GW 1	N	1/4/2010	6,854.81	6.62	6.86	7180 D	722 D	662	391 D	7	1980	3260 D	235	0.48	91 D	1.86	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.07	<0.1	<0.05	<0.001	<0.1	0.103	0.17 U	1.1 U	1.27	0.005 U	-0.4 U	0.5 U
GW 1	N	4/5/2010	6,854.91	6.52	6.75	7260 DH	821 D	763	440 D	8	2090	3810 D	226	0.78	94 D	1.86	0.2	<0.001	<0.01	<0.005	<0.01	<0.05	0.07	<0.1	<0.05	<0.001	<0.1	0.118	0.2	0.36 U	0.56	0.05 U	4.1	0.4 U
GW 1	N	7/12/2010	6,854.71	6.43	7.13	7250 D	757 D	709	406 D	7	2000	3320 D	234 D	0.89	89 D	1.99	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.08	<0.1	<0.05	<0.001	<0.1	0.137	0.26	0.69 U	0.95	-0.02 U	0.3 U	0.05 U
GW 1	N	10/4/2010	6,854.41	6.57	6.85	7200 D	710 D	662	410 D	7	1990	3190 D	228 D	0.91	90 D	2.37	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.08	<0.1	<0.05	<0.001	<0.1	0.122	-0.08 U	1.1	1.02	-0.007 U	2	-0.05 U
GW 1	N	1/3/2011	6,854.31	6.57	6.97	6620 D	739 D	699	404 D	7	1910	3100 D	242 D	0.83	77 D	1.78	0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.08	<0.1	<0.05	<0.001	<0.1	0.119	0.09 U	0.42 U	0.51	-0.008 U	0.9 U	0.3 U
GW 1	N	4/4/2011	6,854.19	6.65	6.90	7000 D	713	677	428 D	7	1920	3130 D	233 D	0.78 D	94 D	2.08	<0.1	0.001	<0.01	<0.005	<0.01	<0.05	0.09	<0.1	<0.05	<0.001	<0.1	0.127	-0.05 U	0.13 U	0.08	0.06 U	0.5 U	0.7
GW 1	N	7/11/2011	6,854.07	6.65	7.15	6890 D	749	710	438 D	7	1940	3130 D	226 D	0.8 D	95 D	2.16	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.1	<0.1	<0.05	<0.001	<0.1	0.127	0.15 U	0.91 U	1.06	-0.006 U	-0.6 U	0.3 U
GW 1	N	10/3/2011	6,853.76	6.59	7.51	6530 D	721	631	419 D	6	1830	2950 D	232 D	0.7 D	89 D	2.38	<0.1	0.003	<0.01	<0.005	<0.01	<0.05	0.1	<0.1	<0.05	<0.001	<0.1	0.104	0.05 U	0.93	0.98	-0.009 U	0.4 U	0.8

TABLE A.1

Southwest Alluvium Data Summary, 1989-2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
GW 1	N	1/2/2012	6,853.63	6.75	6.83 H	6350 D	672	581	388	8	1750	2810 D	236 D	0.58	90 D	6.52	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.11	<0.1	<0.05	<0.001	<0.1	0.103	0.36	0.86 U	2.08	-0.008 U	0.6 U	0.3 U
GW 1	N	4/2/2012	6,853.65	6.81	6.66 H	6470 D	702	580	386	7	1850	2750 D	228 D	0.51	91 D	1.84	<0.1	<0.01	<0.01	<0.005	<0.01	<0.05	0.11	<0.1	<0.05	<0.001	<0.1	0.107	0.04 U	0.77 U	1.58	0.03 U	0.009 U	0.1 U
GW 1	N	7/9/2012	6,853.37	6.59	6.74 H	6270	730	620	433 D	7	1900	2730 D	228 D	0.41	92 D	1.96	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.12	<0.1	<0.05	<0.001	<0.1	0.103	0.23	0.16 U	0.55	-0.003 U	1 U	0.3 U
GW 1	N	10/8/2012	6,853.16	6.61	6.65 H	6230	760	546	408 D	7	1950	2740 D	248 D	0.17	86 D	1.9	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.13	<0.1	<0.05	<0.001	<0.1	0.103	0.26	1.3	1.56	0.01 U	0.6 U	0.5 U
GW 1	N	1/7/2013	6,853.07	6.68	6.64 H	6080	735	612	446 D	7	1860	2760 D	239 D	<0.05	92 D	2.22	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.12	<0.1	<0.05	<0.001	<0.1	0.105	0.3	0.63 U	0.3	-0.003 U	-0.07 U	0.8
GW 1	N	4/1/2013	6,852.96	6.65	6.71 H	6170	758	583	431	7	1920	2810 D	249 D	<0.05	94 D	2.32	0.2	<0.001	<0.001	<0.005	<0.01	<0.001	0.13	<0.1	<0.05	<0.001	<0.1	0.113	0.13	0.05 U	0.13	0.02 U	0.1 U	0.1 U
GW 1	N	7/8/2013	6,852.77	6.52	6.78 H	6650	727	574	408	7	1890	2770 D	240 D	<0.05	88 D	2.2	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.11	<0.1	<0.05	<0.001	<0.1	0.102	0.02 U	0.39 U	0	0.004 U	-0.09 U	0.4 U
GW 1	N	9/30/2013	6,852.87	6.57	6.70 H	6420 H	714	569	404	7	1930	2760 D	236 D	<0.05	90 D	1.82	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.12	<0.1	<0.05	<0.001	<0.1	0.119	0.16	0.43 U	0.16	0.08 U	-0.03 U	0.03 U
GW 1	N	1/6/2014	6,852.67	6.82	6.70	6200	716	563	404	8	1900	2720	235	<0.05	92	1.18	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.11	<0.1	<0.05	<0.001	<0.1	0.113	0.23	0.99 U	0.23	-0.01 U	0.6 U	0.1 U
GW 1	N	3/31/2014	6,852.60	6.79	6.66 H	6250	730	572	411 D	7	1910	2740 D	239 D	<0.05	91 D	2	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.12	<0.1	<0.05	<0.001	<0.1	0.122	0.14 U	0.88 U	0	0.0007 U	-0.8 U	0.1 U
GW 1	N	7/7/2014	6,852.42	6.67	6.87 H	5750	728	545	420 D	8	1420	2770 D	238 D	<0.05	87 D	1.18	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.12	<0.1	<0.05	<0.001	<0.1	0.0844	0.16	0.35 U	0.16	0.009 U	0.4 U	0.2 U
GW 1	N	10/6/2014	6,852.24	6.74	6.74 H	6130	590	560	397	7	1740	2790 D	248 D	<0.05	87 D	2.2	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.07	<0.1	<0.05	<0.001	<0.1	0.102	0.31	0.96 U	0.31	0.003 U	0.2 U	0.6
GW 1	N	1/5/2015	6,852.24	6.81	6.73 H	6530	753	623	446	9	1920	2790 D	235 D	<0.05	88 D	3.14	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.21	<0.1	<0.05	<0.001	<0.1	0.108	0.47	1.5	1.97	0.03 U	0.2 U	1.2 U
GW 1	N	4/6/2015	6,852.04	6.62	6.67 H	6500	600	594	407	8	1950	2910 D	258 D	<0.05	86 D	2.98	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.18	<0.1	<0.05	<0.001	<0.1	0.096	0.48	0.78 U	0.48	0.03 U	-0.2 U	3
GW 1	N	7/6/2015	6,851.85	6.52	6.64 H	6640	630	582	403	8	2010	2930 D	244 D	0.66	87 D	2.66	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.18	<0.1	<0.05	<0.001	<0.1	0.102	0.15	0.96 U	0.15	0.07 U	0.3 U	0.1 U
GW 1	N	10/5/2015	6,851.63	6.67	6.65 H	6450	705	573	395	8	1850	2860 D	250 D	<0.05	82 D	3.36	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.21	<0.1	<0.05	<0.001	<0.1	0.0842	0.34	0.88 U	0.34	0.02 U	0.7 U	2.6
GW 1	N	1/4/2016	6,851.45	6.78	6.64 H	6450	720	588	400	8	1950	2880 D	244 D	<0.05	84 D	2.67	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.23	<0.1	<0.05	<0.001	<0.1	0.0992	0.12 U	-0.2 U	0	0.04 U	-0.4 U	0.9 U
GW 1	N	4/4/2016	6,851.29	6.60	6.82 H	6430	707	587	413	8	1870	2820 D	240 D	<0.05	85 D	2.25	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.21	<0.1	<0.05	<0.001	<0.1	0.103	0.23	1.6	1.83	0.04 U	-0.3 U	1.0 U
GW 1	N	7/11/2016	6,851.13	6.62	6.70 H	6200 D	628	577	400	8	1850	2710 D	245 D	<0.05	92 D	2.7	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.1	<0.1	<0.05	<0.001	<0.1	0.0894	0.18	2.7	2.88	-0.007 U	0.4 U	0.8 U
GW 1	N	10/3/2016	6,850.90	6.78	6.69 H	6210 H	681	570	412	8	1790	2860 D	247 D	<0.05	89 D	1.7	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.13	<0.1	<0.05	<0.001	<0.1	0.0832	0.26	7.6	7.86	0.06 U	0.7 U	3
GW 1	N	1/9/2017	6,850.69	6.77	6.76 H	5980 D	476	555	416	8	1780	2640 D	230 D	<0.05	92 D	1	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.12	<0.1	<0.05	<0.001	<0.1	0.0924	0.03 U	0.27 U	0	0.2	-0.2 U	0.6 U
GW 1	N	4/3/2017	6,850.55	6.60	6.73 H	6090 D	700	551	413 D	10	1820	2910 D	252 D	<0.05	88 D	1.2	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.13	<0.1	<0.05	<0.001	<0.1	0.0981	0.29	1.2 U	0.29	0.01 U	-0.4 U	1.0 U
GW 1	N	7/10/2017	6,850.34	6.61	6.74 H	6120 D	692	586	420 D	7	1770	2580 D	237 D	<0.05	80.5 D	0.7	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.11	<0.1	<0.05	<0.001	<0.1	0.0926	0.6	1.2 U	0.6	-0.01 U	0.6 U	0.5 U
GW 1	N	10/2/2017	6,850.03	6.67	6.73 H	5840 D	676	577	416 D	9	1800	2550 D	240 D	<0.05	77.5 D	0.91	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	0.1	<0.1	<0.05	<0.001	<0.1	0.0995	0.1 U	0.2 U	0	-0.02 U	0.4 U	0.8
GW 1	N	1/8/2018	6,849.85	6.82	6.75 H	6290 D	682	561	411 D	8	1680	2770 D	244 D	<0.05	79.2 D	0.84	0.03	<0.001	<0.001	<0.001	<0.005	<0.001	0.077 D	<0.001	0.012	<0.001	<0.01	0.101	0.3	-0.2 U	0.3	0.02 U	0.5 U	1.4
GW 1	N	4/2/2018	6,849.80	6.70	6.77 H	6200 D	741 D	508	384 D	8	1730	2850 D	255 D	<0.05	82 D	0.56	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	0.038	<0.001	<0.005	<0.001	<0.01	0.102	0.1 U	1.4	1.4	0.07 U	0.2 U	0.7
GW 1	N	7/9/2018	6,849.53	6.70	6.75 H	6100 D	621	524	392 D	9	1730	2600 D	231 D	<0.05	84.5 D	<0.50	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	0.024	<0.001	<0.005	<0.001	<0.01	0.0964	0.4	1.2 U	0.4	0.05 U	-0.2 U	0.6
GW 1	N	10/1/2018	6,849.14	6.73	6.66 H	6140 D	683	515	386 D	9	1780	2740 D	242 D	<0.05	74 D	0.52	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	0.033	<0.001	<0.005	<0.001	<0.01	0.0942	0.2 U	0.7 U	0	0.08 U	0.2 U	0.4 U
GW 1	N	1/7/2019	6,849.00	6.75	6.71 H	5940 D	625	560	429 D	10	1770	2690 D	231 D	<0.05	63.8 D	0.55	<0.03	no data	<0.001	<0.001	<0.005	<0.001	0.014	<0.001	<0.005	no data	<0.01	0.0911	0.2	-0.03 U	0.23	-0.005 U	0.4 U	1
GW 1	N	4/8/2019	6,848.90	6.61	6.71 H	5920 D	685	530	427	9	1800	2780 D	238 D	<0.05	70.2 D	<0.5 J	<0.03	0.003	<0.001	<0.001	<0.005	<0.001	0.009	<0.001	0.007	<0.001	<0.01	0.0982	0.08 U	0.07 U	0.15	0.03	0.3 U	1.1
GW 1	N	7/15/2019	6,848.73	6.74	6.8 H	6010 D	647	501	357	8	1800	2660 D	235 D	<0.05	72.5 D	<0.5	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	0.006 D	<0.001	<0.005	<0.001	<0.01	0.106	0.2 U	2.7	2.9	-0.03 U	0.2 U	0.4 U
GW 1	N	10/9/2019	6,848.35	6.79	6.8 H	5960 DH	718	534	406	10	1760	2740 D	243 D	<0.2 D	66 D	0.6	<0.03	<0.001	<0.001	<0.001	<0.005	<0.001	0.005 D	<0.001	0.009	<0.001	<0.01	0.125	0.3	-0.4 U	0.7	0.008	0.01 U	0.5
GW 2	N	7/19/1989	6,870.30	7.00	7.23	5143	910	412	253	8.3	1293	2267	173	0.06	123	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.22	< 0.1	< 0.05	0.001	< 0.1	0.254	1.5	2.8	4.3	1.1	< 1	6
GW 2	N	10/16/1989	6,870.10	7.00	7.05	5564	789	479	266	11.7	1818	2314	181	0.1	76	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.31	< 0.1	< 0.05	0.001	< 0.1	0.196	1	2.8	3.8	11	1.5	15
GW 2	N	1/10/1990	6,869.70	6.70	7.02	5470	752	421	264	8.75	1451	2329	184	0.08	84	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.19	< 0.1	< 0.05	< 0.001	< 0.1	0.183	< 0.2	< 0.1	0	1	< 1	2.3
GW 2	N	4/5/1990	6,869.40	6.50	7.06	5277	862	391	256	8.1	1730	2226	183	0.11	113	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.41	< 0.1	< 0.05	0.001	< 0.1	0.205	0.5	< 0.1	0.5	< 0.2	1.3	0.8
GW 2	N	7/3/1990	6,868.90	6.30	6.91	5179	801	667	286	9.9	2001	2161	195	< 0.05	52.2	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.01	< 0.05	0.48	< 0.1	< 0.05	< 0.001	< 0.1	0.146	0.4	< 0.1	0.4	< 0.2	< 1	< 1
GW 2	N	10/3/1990	6,868.70	6.50	7.25	5801	888	522	289	9.4	1602	2395	193	< 0.05	61.9	< 1	< 0.1	0.001	< 0.05	< 0.01	0.02	< 0.05	0.55	< 0.1	< 0.05	< 0.001	< 0.1	0.2215	< 0.2	< 0.1	0	< 0.2	< 1	< 1
GW 2	N	1/16/1991	6,868.90	6.60	7.11	5775	926	458	297	8.3	1552	2444	202	0.05	88.2	< 1	< 0.1	< 0.001	< 0.01	0.01	< 0.01	< 0.05	0.39	< 0.1	< 0.05	0.002	< 0.1	0.2404	< 0.2	< 0.1	0	< 0.2	< 1	< 1
GW 2	N	4/2/1991	6,868.80	6.50	6.90	5621	812	432	280	8.1	1465	2560	206	< 0.05	102	< 1	< 0.1	< 0.001	< 0.01	0.02	0.01	< 0.05	0.51	< 0.1	< 0.05	0.001	< 0.1	0.137	< 0.2	1.7	1.7	< 0.2	< 1	< 1
GW 2	N	7/17/1991	6,867.50	6.50	7.30	5820	790	430	258	8.5	1769	2638	199	0.05	131	< 1	< 0.1	< 0.001	< 0.01	0.03	< 0.01	< 0.05	0.5	< 0.1	< 0.05	0.001	< 0.1	0.152	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 2	N	10/15/1991	6,866.80	6.20	6.89	6209	737	579	287	9	2011	2868	197	< 0.05	28.8	< 1	0.27	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.55	< 0.1	< 0.05	< 0.001	< 0.1	0.197	< 0.2	3.1	3.1	< 0.2	< 1	< 1
GW 2	N	1/15/1992	6,866.90	6.20	7.11	5127	765	428	259	7.9	1278	2285	187	< 0.05	51.6	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.03	< 0.05	0.48	< 0.1	< 0.05	< 0.001	< 0.1	0.153	< 0.2	1.3	1.3	< 0.2	2.2	< 1
GW 2	N	4/8/1992	6,867.00	6.20	7.53	5275	725	531	286	10.3	1687	2613	177	< 0.05	22.9	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.46	< 0.1	< 0.05	0.006	< 0.1	0.165	< 0.2	< 1	0	< 0.2	2.4	< 1
GW 2	N	7/8/1992	6,865.20	6.10	7.24	6313	802	581	402	12.8	1931	3194	171	0.07	54	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.4	< 0.1	< 0.05	0.001	< 0.1	0.13	0.2	< 1	0.2	< 0.2	< 1	< 1
GW 2	N	10/6/1992	6,864.10	6.40	7.26	5590	901	422	316	8.8	1563	2256	166	< 0.05	100	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	0.06	0.15	< 0.1	< 0.05	0.002	< 0.1	0.242	0.5	1.6	2.1	< 0.2	< 1	< 1
GW 2	N	1/7/1993	6,864.20	6.40	7.62	5795	730	521	296	10.1	1763	2584	177	< 0.05	64	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.02	< 0.05	0.25	< 0.1	< 0.05	0.005	< 0.1	0.181	0.8	7.9	8.7	< 0.2	< 1	< 1
GW 2	N	4/7/1993	6,864.70	6.50	7.24	5140	670	430	314	6.9	1529	2250	173	< 0.05	79.8	< 1	< 0.1	0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.12	< 0.1	< 0.05	0.001	< 0.1	0.2	0.4	4.4	4.8	< 0.2	< 1	< 1
GW 2	N	7/14/1993	6,863.00	6.70	7.18	5500	776	437	308	7.7	1612	2501	178	0.05	79.8	< 1	< 0.1	0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.22	< 0.1	< 0.05	0.001	< 0.1	0.084	< 0.2	3.1	3.1	< 0.2	< 1	< 1
GW 2	N	10/7/1993	6,862.60	6.80	7.44	4812	693	371	268	6.9	1386	2107	159	0.05	111	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.06	< 0.1	< 0.05	0.001	< 0.1	0.118	0.6	2.2	2.8	< 0.2	< 1	< 1
GW 2	N	1/6/1994	6,861.60	6.80	7.14	5185	673	461	277	7.4	1556	2444	170	0.16	68.1	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.11	< 0.1	< 0.05	< 0.001	< 0.1	0.116	0.3	4.8	5.1	< 0.2	1.8	8.5
GW 2	N	4/12/1994	6,862.30	6.70	7.03	5006	748	355	250	7	1536	2238	165	0.24	80.5	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.29	< 0.1	< 0.05	< 0.001	< 0.1	0.201	1.2	< 1	1.2	< 0.2	3.2	1.4
GW 2	N	7/21/1994	6,861.60	6.70	7.35	5402	774	470	247	8.6	1614	2859	170	0.06	52	< 1	< 0.1	0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.13	< 0.1	< 0.05	0.002	< 0.1	0.117	< 0.2	8.1	8.1	< 0.2	< 1	12.5
GW 2	N	10/5/1994	6,861.20	6.40	7.51	5969	727	590	288	10	1707	2683	177	< 0.05	29.9	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.32	< 0.1	< 0.05	< 0.001	< 0.1	0.094	0.4	< 1	0.4	< 0.2	1.4	< 1
GW 2	N	1/4/1995	6,861.20	6.40	7.16	6044	748	561	270	10.9	1703	2866	174	0.27	25.3	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.35	< 0.1	< 0.05	< 0.001	< 0.1	0.087	1.8	2.5	4.3	< 0.2	< 1	5.7
GW 2	N	4/5/1995	6,861.70	6.50	6.91	6020	660	635	285	10.4	1745	2955	170	0.19	23.1	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.42	< 0.1	< 0.05	< 0.001	< 0.1	0.071	0.4	1.1	1.5	< 0.2	4.4	2.2
GW 2	N	7/6/1995	6,862.40	6.50	7.49	5305	760	475	265	8.6	1409	2404	194	0.27	48.1	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.14	< 0.1	< 0.05	0.002	< 0.1	0.1959	1.7	< 1	1.7	< 0.2	< 1	2.8
GW 2	N	10/3/1995	6,862.60	6.30	7.45	5826	655	600	268	9.5	1791	2841	178	0.2	17.7	< 1	< 0.1	0.002	< 0.01	< 0.01	< 0.01	< 0.05	0.39	< 0.1	< 0.05	< 0.001	< 0.1	0.0751	< 0.2	< 1	0	< 0.2	1.8	< 1
GW 2	N	1/3/1996	6,859.60	6.40	6.91	5302	595	575	280	9.7	1802	2409	133	< 0.05	16.7	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.39	< 0.1	< 0.05	< 0.001	< 0.1	0.071	< 0.2	< 1	0	< 0.2	2.4	< 1

TABLE A.1

Southwest Alluvium Data Summary, 1989-2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
GW 2	N	4/2/1996	6,859.40	6.50	7.64	6059	622	550	282	10	1732	2936	167	< 0.05	24.1	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.44	< 0.1	< 0.05	< 0.001	< 0.1	0.118	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 2	N	7/7/1996	6,859.10	6.30	7.19	6246	600	595	286	10.4	1643	2870	155	0.1	20.5	< 1	< 0.1	0.003	< 0.01	< 0.01	< 0.01	< 0.05	0.49	< 0.1	< 0.05	0.001	< 0.1	0.099	0.2	< 1	0.2	< 0.2	< 1	< 1
GW 2	N	10/1/1996	6,859.30	6.40	6.99	6280	628	673	289	10.3	1670	2955	166	< 0.05	12.9	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.43	< 0.1	< 0.05	0.002	< 0.1	0.07	< 0.2	< 1	0	1	< 1	< 1
GW 2	N	1/22/1997	6,858.90	6.30	7.43	6100	600	620	275	10.2	1690	2945	177	< 0.05	10.2	< 1	< 0.1	0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.35	< 0.1	< 0.05	< 0.001	< 0.1	0.054	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 2	N	4/8/1997	6,858.70	6.60	7.77	5910	667	572	259	9.7	1630	2851	193	< 0.05	19.8	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.41	< 0.1	< 0.05	< 0.001	< 0.1	0.131	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 2	N	7/8/1997	6,858.60	6.80	7.33	6090	666	631	255	9.9	1640	2720	182	< 0.05	10.7	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.29	< 0.1	< 0.05	< 0.001	< 0.1	0.061	0.6	< 1	0.6	< 0.2	< 1	< 1
GW 2	N	10/7/1997	6,858.90	6.20	7.21	6090	618	610	266	9.7	1630	3050	170	< 0.05	10.7	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.38	< 0.1	< 0.05	< 0.001	< 0.1	0.062	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 2	N	1/16/1998	6,858.50	6.50	7.52	5990	653	582	271	9.9	1640	3000	188	0.13	16	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.38	< 0.1	< 0.05	< 0.001	< 0.1	0.0953	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 2	N	4/7/1998	6,858.40	6.40	7.80	5880	638	596	248	9.9	1500	2700	174	< 0.05	8.96	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.3	< 0.1	< 0.05	< 0.001	< 0.1	0.0656	0.7	< 1	0.7	< 0.2	< 1	< 1
GW 2	N	7/7/1998	6,858.60	6.10	7.80	5880	638	596	248	9.9	1500	2700	174	< 0.05	8.96	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.3	< 0.1	< 0.05	< 0.001	< 0.1	0.0656	0.7	< 1	0.7	< 0.2	< 1	< 1
GW 2	N	10/6/1998	6,860.30	6.48	7.59	5800	651	602	253	10.7	1500	2770	165	0.16	8.73	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.33	< 0.1	< 0.05	< 0.001	< 0.1	0.0732	0.6	< 1	0.6	< 0.2	< 1	< 1
GW 2	N	1/5/1999	6,858.20	6.70	7.88	5780	588	552	217	9.8	1460	2900	168	0.07	7.04	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.35	< 0.1	< 0.05	< 0.001	< 0.1	0.0662	2.3	< 1	2.3	< 0.2	< 1	< 1
GW 2	N	4/6/1999	6,858.20	6.40	7.57	5710	580	582	221	9.6	1410	2500	162	0.07	6.12	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.34	< 0.1	< 0.05	< 0.001	< 0.1	0.0594	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 2	N	7/13/1999	6,857.98	6.60	7.90	5530	594	562	223	14.5	1350	2660	166	0.06	5.95	< 1	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	0.4	< 0.1	< 0.05	< 0.001	< 0.1	0.0057	< 0.2	< 1	0	< 0.2	< 1	2.3
GW 2	N	10/5/1999	6,859.30	6.52	7.39	5510	537	512	229	10.1	1420	2380	164	0.24	5.5	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.49	< 0.1	< 0.05	< 0.001	< 0.1	0.0705	0.3	< 1	0.3	< 0.2	< 1	< 1
GW 2	N	1/4/2000	6,858.70	6.60	7.76	5440	587	549	185	11	1430	2610	143	< 0.05	4.05	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.44	< 0.1	< 0.05	0.001	< 0.1	0.0681	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 2	N	5/8/2000	6,858.40	6.40	7.64	5410	540	528	234	9.5	1410	2590	155	< 0.05	2.74	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.46	< 0.1	< 0.05	< 0.001	< 0.1	0.0685	< 0.2	< 1	0	< 0.2	5.9	< 1
GW 2	N	7/17/2000	6,858.10	6.37	7.65	5440	571	536	213	9.61	1400	2400	158	< 0.05	2.95	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.44	< 0.1	< 0.05	< 0.001	< 0.1	0.0602	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 2	N	10/9/2000	6,857.65	6.35	7.54	5310	476	449	194	10.5	1370	1930	130	0.05	4.09	< 1	< 0.1	0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.34	< 0.1	< 0.05	0.001	< 0.1	0.064	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 2	N	1/8/2001	6,858.10	6.51	7.23	5270	599	537	211	9.7	1420	2620	159	0.09	4.04	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.49	< 0.1	< 0.05	< 0.001	< 0.1	0.063	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 2	N	2/6/2001	6,858.65	6.79	7.37	5290	679	578	230	10.4	1410	2800	153	0.05	3.84	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.5	< 0.1	< 0.05	< 0.001	< 0.1	0.065	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 2	N	3/6/2001	6,858.80	6.86	7.54	5150	586	528	275	10.6	1400	2680	140	< 0.05	3.36	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.5	< 0.1	< 0.05	< 0.001	< 0.1	0.0626	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 2	N	4/9/2001	6,859.30	6.92	7.26	5200	668	568	220	10.1	1420	2730	152	< 0.05	3.68	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.54	< 0.1	< 0.05	< 0.001	< 0.1	0.074	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 2	N	5/7/2001	6,859.20	6.46	7.57	5330	590	514	217	9.7	1420	2390	168	0.11	3.49	< 1	0.15	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.59	< 0.1	< 0.05	< 0.001	< 0.1	0.067	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 2	N	6/4/2001	6,859.55	6.47	7.33	4490	583	520	184	9.5	1390	2460	164	0.09	3.8	< 1	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	0.51	< 0.1	< 0.05	0.004	< 0.1	0.061	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 2	N	7/9/2001	6,859.61	7.09	7.12	5340	624	561	210	9.3	1450	2450	166	< 0.05	4.4	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.53	< 0.1	< 0.05	< 0.001	< 0.1	0.0683	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 2	N	8/7/2001	6,859.45	6.43	7.20	5320	570	520	220	9.8	1460	2300	170	< 0.05	4.4	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.5	< 0.1	< 0.05	< 0.001	< 0.1	0.075	< 0.2	2.2	2.2	< 0.2	< 1	< 1
GW 2	N	9/10/2001	6,859.70	6.38	7.10	5270	600	530	209	10.1	1500	2400	177	< 0.05	6.3	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.48	< 0.1	< 0.05	< 0.001	< 0.1	0.0627	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 2	N	10/1/2001	6,859.80	6.48	7.60	5330	570	510	222	10.7	1480	2200	202	0.07	6	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.45	< 0.1	< 0.05	< 0.001	< 0.1	0.0659	0.3	< 1	0.3	< 0.2	< 1	< 1
GW 2	N	11/5/2001	6,860.10	6.50	7.10	5340	619	532	212	10.8	1460	2550	200	0.05	7.6	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.5	< 0.1	< 0.05	< 0.001	< 0.1	0.0584	0.4	< 1	0.4	< 0.2	< 1	< 1
GW 2	N	12/3/2001	6,860.20	6.47	7.10	5320	582	494	195	9.5	1480	2270	182	0.06	8.6	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.45	< 0.1	< 0.05	< 0.001	< 0.1	0.0622	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 2	N	1/8/2002	6,860.10	6.54	7.00	5300	683	543	186	11	1460	2640	199	< 0.05	9	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.47	< 0.1	< 0.05	< 0.001	< 0.1	0.0609	0.4	1.2	1.6	< 0.2	< 1	< 1
GW 2	N	2/4/2002	6,860.35	6.57	7.20	5310	662	519	201	10.9	1470	2490	205	0.09	11.4	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.48	< 0.1	< 0.05	< 0.001	< 0.1	0.0551	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 2	N	3/4/2002	6,860.10	6.49	7.30	5290	622	512	230	10.7	1470	2540	203	0.06	15.9	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.58	< 0.1	< 0.05	< 0.001	< 0.1	0.0833	0.4	< 1	0.4	< 0.2	< 1	< 1
GW 2	N	4/1/2002	6,860.28	6.38	7.15	5350	656	520	229	11.6	1520	2590	196	0.05	17	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.52	< 0.1	< 0.05	< 0.001	< 0.1	0.0664	0.4	< 1	0.4	< 0.2	< 1	< 1
GW 2	N	5/6/2002	6,860.32	6.38	7.36	5340	643	509	239	11.6	1530	2410	199	0.06	20.4	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.52	< 0.1	< 0.05	< 0.001	< 0.1	0.0738	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 2	N	6/3/2002	6,860.33	6.36	7.38	5390	645	508	216	9.8	1560	2360	178	< 0.05	22	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.52	< 0.1	< 0.05	< 0.001	< 0.1	0.0646	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 2	N	7/8/2002	6,859.98	6.25	7.67	5470	648	530	178	11.3	1600	2430	208	0.16	22.5	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.48	< 0.1	< 0.05	< 0.001	< 0.1	0.0821	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 2	N	10/8/2002	6,859.90	6.40	7.52	5550	619	494	228	9.7	1690	2260	185	0.1	30.1	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.51	< 0.1	< 0.05	< 0.001	< 0.1	0.064	2	< 1	2	< 0.2	< 1	< 1
GW 2	N	1/6/2003	6,859.88	6.65	7.52	5640	705	571	276	8.6	1750	2580	196	0.18	27.5	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.56	< 0.1	< 0.05	< 0.001	< 0.1	0.0829	< 0.2	4.2	4.2	< 0.2	< 1	< 1.0
GW 2	N	4/7/2003	6,859.98	6.35	7.12	5760	678	518	267	14.3	1810	2210	214	0.12	26.7	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.47	< 0.1	< 0.05	< 0.001	< 0.1	0.0886	0.7	< 1	0.7	< 0.2	< 1	< 1.0
GW 2	N	7/7/2003	6,859.91	6.12	7.14	5110	658	505	246	12.4	1970	2360	189	0.11	26.3	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.55	< 0.1	< 0.05	< 0.001	< 0.1	0.0808	< 0.2	< 1	0	< 0.2	< 1	< 1.0
GW 2	N	10/6/2003	6,859.68	6.19	8.00	5980	760	586	305	24.8	2080	2630	233	0.2	24.8	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.63	< 0.1	< 0.05	< 0.001	< 0.1	0.104	< 0.2	< 1	0	< 0.2	< 1	< 1.0
GW 2	N	1/5/2004	6,859.72	6.40	7.49	6000	756	579	280	11.6	2100	2610	260	0.09	22.8 D	< 1.0	0.2	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.73	< 0.1	< 0.05	< 0.001	< 0.1	0.0952 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
GW 2	N	4/5/2004	6,859.94	6.68	6.72	6130	771	588	318	11.6	2080	2590 D	225	0.21	19.4 D	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.68	< 0.1	< 0.05	< 0.001	< 0.1	0.108 D	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 2	N	7/12/2004	6,859.61	6.12	6.51	6300	781	568	341	13.2	2220	2560 D	235	0.15	15.5 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	0.02	< 0.05	0.66	< 0.1	< 0.05	< 0.001	< 0.1	0.109 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
GW 2	N	10/4/2004	6,859.21	6.21	6.95	6600	761 D	569 D	346	11.5	2240	2570 D	224	< 0.05	12.8 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.69	< 0.1	< 0.05	< 0.001	< 0.1	0.102 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
GW 2	N	1/3/2005	6,859.48	6.48	6.85	6480	836 D	618 D	356	12	2290	2720 D	220	0.08	13.3 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.75	< 0.1	< 0.05	< 0.001	< 0.1	0.124	0.4	< 1.0	0.4	< 0.2	< 1.0	< 1.0
GW 2	N	4/4/2005	6,859.64	6.38	6.99	6370	809	598	360	11	2360	2810	211	< 0.05	8.7	< 1.0	1.3	< 0.001	< 0.01	0.011	0.01	< 0.05	0.82	< 0.1	< 0.05	< 0.001	< 0.1	0.117	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
GW 2	N	7/11/2005	6,859.10	6.30	7.10	6590	780 D	612 D	376	11.8	2350	2900 D	232	0.13	6.2 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.75	< 0.1	< 0.05	< 0.001	< 0.1	0.116	0.4	< 1.0	0.4	< 0.2	< 1.0	< 1.0
GW 2	N	10/3/2005	6,858.90	6.35	7.02	6730	815 D	638 D	376	12.3	2300	3040 D	242	0.08	7.6 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.81	< 0.1	< 0.05	< 0.001	< 0.1	0.132	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
GW 2	N	1/9/2006	6,858.86	6.53	7.60	6770	720	654 D	350	10.3	2180	2730 D	199	0.19	8.2 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.85	< 0.1	< 0.05	< 0.001	< 0.1	0.126	< 0.2	1.4	1.4	< 0.2	< 1.0	< 1.0
GW 2	N	4/3/2006	6,858.93	6.24	7.03	7000	844 D	734 D	341	12.4	2390	3170 D	245	0.22	7.2 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.91	< 0.1	< 0.05	< 0.001	< 0.1	0.115 D	0.4	2.7	3.1	< 0.2	< 1.0	< 1.0
GW 2	N	7/17/2006	6,858.63	6.28	6.58	7000	792 D	752 D	395	13.7	2360	3480 D	230	0.06	7.0 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.94	< 0.1	< 0.05	< 0.001	< 0.1	0.127	0.2	3.8	4	< 0.2	< 1.0	< 1.0
GW 2	N	10/2/2006	6,858.55	6.37	6.69	7380	754 D	756 D	335	12.5	2440	3300 D	166	0.16	6.3 D	< 0.5	0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.96	< 0.1	< 0.05	< 0.001	< 0.1	0.113 D	0.4	1.7	2.1	< 0.2	< 1	< 1
GW 2	N	1/8/2007	6,858.54	6.56	6.64	7500	715 D	785 D	334	13.6	2330	3430 D	204	0.1	7.4 D	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.01	<0.1	<0.05	<0.001	<0.1	0.115	<0.2	<1	0	<0.2	<1	<1
GW 2	N	4/9/2007	6,858.90	6.42	6.67	7100	739 D	869 D	336	15.6	2320	3680 D	217	<0.05	7.9 D	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.06	<0.1	<0.05	<0.001	<0.1	0.118	<0.2	<1	0	<0.2	<1	<1
GW 2	N	7/9/2007	6,858.43	6.28	6.65	7580	734 D	922 D	395	13.3	2460	3990 D	180	0.07	8.5	<0.5	<0.1	0.009	<0.01	<0.005	<0.01	<0.05	0.98	<0.1	<0.05	<0.001	<0.1	0.118	<0.2	<1	0	<0.2	<1	<1
GW 2	N	10/1/2007	6,858.13	6.42	6.54	7990	654 D	868 D	382 D	14.2	2400	3700 D	238 D	<0.05	4.8	0.64	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.27	<0.1	<0.05	<0.001	<0.1	0.117	<0.2	<1	0	<0.2	<1	<1

TABLE A.1
Southwest Alluvium Data Summary, 1989-2019
United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
GW 2	N	1/14/2008	6,858.13	6.42	6.59	8180	667 D	921 D	386 D	14.3	2330	3720 D	236 D	< 0.05	10	0.74	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.11	< 0.1	< 0.05	< 0.001	< 0.1	0.102 D	< 0.2	< 1	0	< 0.2	< 1	1.1
GW 2	N	4/7/2008	6,858.53	6.28	6.61	7750	705 D	1030 D	419 D	15.8 D	2190	4190 D	209	< 0.05	12.6	1.08	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.22	< 0.1	< 0.05	< 0.001	< 0.1	0.111	0.2 U	0.5 U	0.7	-0.2 U	-9 U	1
GW 2	N	7/7/2008	6,858.18	6.08	6.57 H	7780 H	659	962	368 D	12	2290	4240 D	216	< 0.05	11.6	1.53	< 0.1	< 0.003	< 0.01	< 0.005	< 0.01	< 0.05	1.22	< 0.1	< 0.05	< 0.001	0.1	0.0949	-0.02 U	1.9	1.88	-0.4 U	0.5 U	0.6 U
GW 2	N	10/6/2008	6,857.68	6.22	6.64	8230	635	987	362 D	12	2250	4380 D	209	< 0.1	13.6	1.33	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.21	< 0.1	< 0.05	< 0.001	< 0.1	0.0964	-0.08 U	0.34 U	0.26	0.1 U	-0.8 U	1.2
GW 2	N	1/12/2009	6,857.73	6.19	6.54	8540	615	1000	395	13	2270	4300 D	188	<0.05	15.3	2.08	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	0.74	<0.1	<0.05	<0.001	<0.1	0.0508	0.13 U	1.7	1.83	-0.3 U	-1 U	1.5
GW 2	N	4/6/2009	6,857.48	6.25	6.39	8430	603 D	1020 D	396 D	12	2300	4360 D	205	<0.05	17.9	2.72	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.24	<0.1	<0.05	0.001	<0.1	0.0980 D	0.21	1.7	1.91	0.02 U	-1 U	0.6 U
GW 2	N	7/6/2009	6,857.48	6.13	6.56	8530 H	634 D	1050	382 D	13	2260	5020 D	215	<0.05	13.6	2.56	<0.1	<0.001	<0.01	<0.005	0.01	<0.05	1.42	<0.1	<0.05	<0.001	<0.1	0.0975	0.34	1.2	1.54	-0.01 U	-0.8 U	0.6
GW 2	N	10/6/2009	6,856.98	6.19	6.66	8580	599 D	1060	374 D	13	2320	4720 D	222	<0.05	13.9	3.57	<0.1	<0.001	<0.01	<0.005	0.01	<0.05	1.35	<0.1	<0.05	<0.001	<0.1	0.0896 D	0.29	1.3 U	1.59	-0.02 U	-2 U	0.5 U
GW 2	N	1/4/2010	6,856.93	6.35	6.68	8900 D	608 D	1100	383 D	13	2350	4910 D	215	<0.05	14.6	3.37	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.31	<0.1	<0.05	<0.001	<0.1	0.087	0.17	1.6	1.77	0.02 U	-0.6 U	0.3 U
GW 2	N	4/5/2010	6,857.13	6.22	6.49	8750 DH	685 D	1200	430 D	15	2410	5080 D	205	<0.05	16.6 D	3.54	<0.1	<0.001	<0.01	<0.005	0.01	<0.05	1.48	<0.1	<0.05	<0.001	<0.1	0.0946	0.19	1.2	1.39	0.07 U	1.7 U	0.5 U
GW 2	N	7/12/2010	6,856.83	6.17	7.05	8770 D	639 D	1130	397 D	13	2370	4530 D	200 D	0.05	14.8 D	4.36	<0.1	<0.001	<0.01	<0.005	0.01	<0.05	1.56	<0.1	<0.05	<0.001	<0.1	0.0971	0.25	0.47 U	0.72	0.02 U	-0.2 U	0.2 U
GW 2	N	10/4/2010	6,856.48	6.27	7.15	8770 D	613 D	1080	402 D	14	2360	4550 D	193 D	0.07	16 D	5.68	<0.1	<0.001	<0.01	<0.005	0.01	<0.05	1.44	<0.1	<0.05	<0.001	<0.1	0.0882	0.13 U	1.3	1.43	0.4	1.9	0.2 U
GW 2	N	1/3/2011	6,856.48	6.24	6.55	8340 D	635 D	1170	396 D	15	2260	4560 D	211 D	0.11	14 D	4.8	<0.1	<0.001	<0.01	<0.005	0.01	<0.05	1.54	<0.1	<0.05	<0.001	<0.1	0.0957	0.03 U	0.46 U	0.49	-0.03 U	0.7 U	2.1
GW 2	N	4/4/2011	6,856.18	6.40	6.57	8520 D	612	1120	418 D	15	2260	4620 D	211 D	0.15	16 D	5.36	<0.1	<0.001	<0.01	<0.005	0.02	<0.05	1.54	<0.1	<0.05	<0.001	<0.1	0.0862 D	0.04 U	0.24 U	0.28	0.07 U	-0.3 U	0.8
GW 2	N	7/11/2011	6,856.19	6.34	7.11	8520 D	613	1140	411 D	15	2250	4520 D	204 D	0.3 D	17 D	5.4	<0.1	<0.001	<0.01	<0.005	0.01	<0.05	1.66	<0.1	<0.05	<0.001	<0.1	0.093	-0.002 U	1.6	1.598	0.004 U	-1 U	0.8 U
GW 2	N	10/3/2011	6,855.85	6.33	7.27	8490 D	613	1130	397 D	15	2080	4590 D	208 D	0.4 D	16 D	6.08	<0.1	0.007	<0.01	<0.005	<0.01	<0.05	1.56	<0.1	<0.05	<0.001	<0.1	0.0834	0.09 U	0.99	1.08	-0.008 U	-0.2 U	0.3 U
GW 2	N	1/2/2012	6,855.63	6.42	6.56 H	8580 D	578	1080	376	16	2030	4580 D	208 D	0.5 D	14.7 D	6.48	<0.1	<0.001	<0.01	<0.005	0.01	<0.05	1.45	<0.1	<0.05	<0.001	<0.1	0.088	0.45	0.49 U	1.43	0.1 U	0.2 U	0.03 U
GW 2	N	4/2/2012	6,855.94	6.48	6.39 H	8910 D	626	1110	379	16	2200	4570 D	204 D	0.73	16.7 D	6.92	<0.1	<0.01	<0.01	<0.005	0.01	<0.05	1.59	<0.1	<0.05	<0.001	<0.1	0.0924	0.25	1	2.25	0.03 U	0.1 U	0.4 U
GW 2	N	7/9/2012	6,855.43	6.33	6.48 H	8790	616	1220	401 D	16	2180	4530 D	203 D	1.22	15.4 D	5.68	<0.1	<0.001	<0.001	<0.005	0.01	<0.001	1.64	<0.1	<0.05	<0.001	<0.1	0.0852	0.28	0.11 U	0.5	0.009 U	0.6 U	0.1 U
GW 2	N	10/8/2012	6,855.28	6.39	6.43 H	8730	628	1130	382 D	17	2230	4700 D	219 D	1.4 D	15 D	5.68	<0.1	<0.001	<0.001	<0.005	0.01	<0.001	1.7	<0.1	<0.05	<0.001	<0.1	0.0865	0.26	0.87 U	0.26	0.02 U	0.5 U	0.5
GW 2	N	1/7/2013	6,855.33	6.37	6.39 H	8820	612	1220	416 D	18	2210	4680 D	206 D	1.35	15 D	6.2	<0.1	<0.001	<0.001	<0.005	0.01	<0.001	1.63	<0.1	<0.05	<0.001	<0.1	0.0905	0.18 U	0.91 U	0	0.01 U	0.3 U	0.5 U
GW 2	N	4/1/2013	6,855.01	6.38	6.45 H	8590	604	1200	402 D	18	2230	4820 D	213 D	1.93	15 D	6.64	<0.1	<0.001	<0.001	<0.005	0.01	<0.001	1.65	<0.1	<0.05	<0.001	<0.1	0.0962	0.10 U	0.64 U	0	0.01 U	-0.4 U	0.4 U
GW 2	N	7/8/2013	6,854.73	6.21	6.59 H	8940	591	1190	388 D	17	2210	4740 D	194 D	2.73	16 D	5.44	<0.1	<0.001	<0.001	<0.005	0.01	<0.001	1.58	<0.1	<0.05	<0.001	<0.1	0.0867	0.21	0.38 U	0.21	0.06 U	-0.08 U	0.5 U
GW 2	N	9/30/2013	6,854.98	6.28	6.44 H	8970 H	570	1170	383 D	17	2170	4760 D	201 D	2.82	16 D	5.16	<0.1	<0.001	<0.001	<0.005	0.01	0.002	1.59	<0.1	<0.05	<0.001	<0.1	0.0974	0.33	0.77 U	0.33	0.03 U	-0.1 U	0.1 U
GW 2	N	1/6/2014	6,854.67	6.57	6.39	8500	575	1170	387	18	2180	4600	206	3.06	14	3.36	<0.1	<0.001	<0.001	<0.005	0.01	<0.001	1.6	<0.1	<0.05	<0.001	<0.1	0.0918	0.39	1.1 U	0.39	0.01 U	0.2 U	0.3 U
GW 2	N	3/31/2014	6,854.70	6.47	6.43 H	8740	574	1150	385 D	18	2210	4680 D	212 D	3.91	14 D	8.56	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.63	<0.1	<0.05	<0.001	<0.1	0.099	0.25	1.8	2.05	-0.004 U	-1 U	0.2 U
GW 2	N	7/7/2014	6,854.49	6.64	6.56 H	8680	551	1120	378 D	20	1940	4870 D	200 D	4.66	14 D	3.43	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.57	<0.1	<0.05	<0.001	<0.1	0.071	0.22	1.1 U	0.22	0.05 U	-0.009 U	0.2 U
GW 2	N	10/6/2014	6,854.30	6.42	6.43 H	8790	574	1200	389 D	19	2210	4840 D	201 D	5.5 D	15 D	6.04	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.54	<0.1	<0.05	<0.001	<0.1	0.0867	0.28	0.77 U	0.28	-0.05 U	0.9 U	0.4 U
GW 2	N	1/5/2015	6,854.06	6.53	6.53 H	9030	595	1230	419 D	22	2180	4580 D	197 D	3.76	16 D	6.16	<0.1	0.001	<0.001	<0.005	0.01	<0.001	1.5	<0.1	<0.05	<0.001	<0.1	0.0861	0.4	1.1 U	0.4	-0.008 U	0.9 U	1.0 U
GW 2	N	4/6/2015	6,854.20	6.36	6.45 H	8860	428	1160	374 D	19	2160	4920 D	239 D	4.57	16.8 D	6.64	0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.26	<0.1	<0.05	<0.001	<0.1	0.0687	0.45	0.3 U	0.45	-0.01 U	-0.3 U	3
GW 2	N	7/6/2015	6,853.92	6.26	6.36 H	8990	562	1150	379	19	2310	5020 D	215 D	3.8 D	17.0 D	7.2	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.34	<0.1	<0.05	<0.001	<0.1	0.0841	0.19	2.9	3.09	0.007 U	-0.01 U	1.3 U
GW 3	N	7/20/1989	6,870.50	6.80	6.59	4898	891	273	219	5.3	1354	1798	154	0.11	137	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	1.6	< 0.1	< 0.05	0.002	< 0.1	0.127	0.8	< 1	0.8	3.3	2.7	4.1
GW 3	N	10/16/1989	6,870.40	6.80	7.51	4658	802	256	210	7	1214	1704	150	0.11	141	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	1.5	< 0.1	< 0.05	0.005	< 0.1	0.132	0.5	< 1	0.5	3.3	< 1	4.1
GW 3	N	1/4/1990	6,870.20	6.40	6.74	4784	890	259	217	5.1	1452	1847	177	0.13	146	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	1.5	< 0.1	< 0.05	0.002	< 0.1	0.132	0.9	< 1	0.9	< 0.2	< 1	1.2
GW 3	N	4/3/1990	6,869.60	6.80	7.18	4859	888	280	218	5.1	1362	1775	170	0.11	111	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	1.2	< 0.1	< 0.05	0.001	< 0.1	0.103	1	< 1	1	< 0.2	< 1	1.5
GW 3	N	7/2/1990	6,869.20	6.40	7.00	4794	954	276	195	6.9	1418	1841	164	< 0.05	147	< 1	< 0.1	< 0.001	< 0.05	< 0.01	0.01	< 0.05	1.29	< 0.1	< 0.05	< 0.001	< 0.1	0.136	0.2	1.2	1.4	< 0.2	< 1	< 1
GW 3	N	10/2/1990	6,869.10	6.60	7.18	4699	770	245	211	5.1	1222	1911	169	< 0.05	102	< 1	< 0.1	< 0.001	< 0.05	0.01	0.01	< 0.05	1.5	< 0.1	< 0.05	< 0.001	< 0.1	0.094	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 3	N	1/16/1991	6,869.10	6.50	7.12	4805	928	290	229	8.8	1057	2004	189	< 0.05	148	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.45	< 0.1	< 0.05	< 0.001	< 0.1	0.1387	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 3	N	4/2/1991	6,869.00	6.50	7.15	4935	897	272	221	4.7	1043	1990	185	< 0.05	162	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.43	< 0.1	< 0.05	0.002	< 0.1	0.07	0.3	< 1	0.3	< 0.2	5.6	< 1
GW 3	N	7/16/1991	6,867.80	6.60	7.09	4829	828	255	212	5.4	1526	2011	103	0.17	37.5	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.01	< 0.05	1.4	< 0.1	< 0.05	< 0.001	< 0.1	0.128	0.3	< 1	0.3	< 0.2	12.8	< 1
GW 3	N	10/14/1991	6,866.90	6.40	6.84	5094	739	226	227	4.7	1330	1856	197	< 0.05	87.2	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.02	< 0.05	1.11	< 0.1	< 0.05	0.001	< 0.1	0.14	0.2	< 1	0.2	< 0.2	< 1	< 1
GW 3	N	1/14/1992	6,867.20	6.40	7.01	4589	794	262	212	5.8	1345	1762	172	< 0.05	90.1	< 1	0.16	< 0.001	< 0.01	< 0.01	0.02	< 0.05	1.61	< 0.1	0.11	0.001	< 0.1	0.08	< 0.2	< 1	0	< 0.2	13.6	< 1
GW 3	N	4/9/1992	6,867.20	6.50	7.32	4757	836	267	261	7.4	1114	1874	179	0.14	86.8	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.21	< 0.1	< 0.05	0.024	< 0.1	0.155	0.8	3.4	4.2	< 0.2	< 1	< 1
GW 3	N	7/7/1992	6,865.40	6.30	7.42	4877	785	295	274	7.6	964	1907	111	0.08	112	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.25	< 0.1	< 0.05	0.002	< 0.1	0.12	< 0.2	2.7	2.7	< 0.2	< 1	< 1
GW 3	N	10/7/1992	6,864.20	6.50	7.32	4766	849	273	288	9.3	1537	1932	182	< 0.05	120	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.92	< 0.1	< 0.05	0.002	< 0.1	0.331	0.8	< 1	0.8	< 0.2	< 1	3.3
GW 3	N	1/7/1993	6,864.30	6.40	7.48	5105	903	260	244	6	1610	1968	188	< 0.05	134	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.71	< 0.1	< 0.05	0.005	< 0.1	0.602	0.4	3.3	3.7	< 0.2	< 1	< 1
GW 3	N	4/7/1993	6,864.90	6.40	7.07	4791	851	248	277	4.7	1419	1879	183	< 0.05	112	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.64	< 0.1	< 0.05	0.001	< 0.1	0.219	0.6	< 1	0.6	< 0.2	2.2	< 1
GW 3	N	7/14/1993	6,863.40	6.40	7.09	4780	989	270	293	5.7	1745	1913	201	< 0.05	94.7	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.81	< 0.1	< 0.05	0.001	< 0.1	0.135	1.6	3	4.6	< 0.2	< 1	1.8
GW 3	N	10/7/1993	6,862.70	6.60	7.22	4614	889	252	238	6.1	1540	1813	71.8	0.05	119	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.79	< 0.1	< 0.05	0.002	< 0.1	0.08	0.6	< 1	0.6	< 0.2	< 1	< 1
GW 3	N	1/6/1994	6,862.70	6.50	7.04	4960	889	251	261	5.6	1573	1836	177	0.11	107	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.92	< 0.1	< 0.05	< 0.001	< 0.1	0.099	0.8	< 1	0.8	< 0.2	< 1	< 1
GW 3	N	4/13/1994	6,863.00	6.60	6.86	4709	866	244	234	5.7	1525	1825	167	0.39	113	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.89	< 0.1	< 0.05	< 0.001	< 0.1	0.096	1.7	< 1	1.7	< 0.2	5.9	1.9
GW 3	N	7/21/1994	6,861.80	6.50	7.16	4790	953	256	250	6.2	1512	1943	160	0.13	105	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	2.26	< 0.1	< 0.05	< 0.001	< 0.1	0.082	0.4	< 1	0.4	< 0.2	< 1	< 1
GW 3	N	10/5/1994	6,861.50	6.30	7.59	4949	942	250	271	6.7	1481	1938	165	0.25	117	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.87	< 0.1	< 0.05	< 0.001	< 0.1	0.083	< 0.2	1.1	1.1	< 0.2	1.7	1.5
GW 3	N	1/5/1995	6,861.50	6.40	7.34	5101	990	263	256	7.4	1532	1938	152	0.32	95.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.97	< 0.1	< 0.05	< 0.001	< 0.1	0.078	0.9	2.5	3.4	< 0.2	< 1	4.8
GW 3	N	4/5/1995	6,862.30	6.50	7.07	4978	920	240	224	5.2	1519	2090	210	0.41	104	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.91	< 0.1	< 0.05	< 0.001	< 0.1	0.08	0.5	< 1	0.5	< 0.2	< 1	< 1
GW 3	N	7/6/1995	6,860.80	6.40	7.50	4792	914	281	252	6.3	1519	1858	171	0.27	96.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.92	< 0.1	< 0.05	0.002	< 0.1	0.0882	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 3	N	10/3/1995	6,860.20	6.50	7.41	5055	905	267	232	5.8	1512	1905	174	0.41	99.1	< 1	< 0.1	0.003	< 0.01	< 0.01	< 0.01	< 0.05	1.93	< 0.1	< 0.05	0.012	< 0.1	0.0868	0.3	< 1	0.3	< 0.2	< 1	< 1
GW 3	N	1/3/1996	6,859.80	6.50	6.96	4495	805	240	235	6.1	1521	1650	138	< 0.05	106	< 1	< 0.1	0.002	< 0.01	< 0.01	< 0.01	< 0.05	1.74	< 0.1	< 0.05	0.014	< 0.1	0.081	0.4	< 1	0.4	0.4	< 1	< 1
GW 3	N	4/2/1996	6,859.80	6.40	7.64	5010	875	275	260	7	1510	1915	155	< 0.05	111	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.82	< 0.1	< 0.05	< 0.001	< 0.1	0.087	< 0.2	< 1	0	< 0.2	< 1	< 1

TABLE A.1

Southwest Alluvium Data Summary, 1989-2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
GW 3	N	7/7/1996	6,859.70	6.30	7.13	4844	865	260	245	7.4	1434	1860	150	0.14	102	< 1	< 0.1	0.01	< 0.01	< 0.01	< 0.01	< 0.05	1.99	< 0.1	< 0.05	< 0.001	< 0.1	0.1	0.3	< 1	0.3	1.2	< 1	< 1
GW 3	N	10/1/1996	6,859.70	6.40	6.99	4970	909	277	239	6.7	1480	1884	141	0.05	115	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.92	< 0.1	< 0.05	0.001	< 0.1	0.072	< 0.2	< 1	0	0.4	< 1	< 1
GW 3	N	1/22/1997	6,859.40	6.40	7.51	4770	885	275	228	7.3	1480	1937	166	0.11	114	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.92	< 0.1	< 0.05	< 0.001	< 0.1	0.072	0.6	< 1	0.6	< 0.2	< 1	< 1
GW 3	N	4/8/1997	6,859.30	6.50	7.59	4990	892	277	227	6.6	1430	1994	171	0.06	117	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.93	< 0.1	< 0.05	0.02	< 0.1	0.086	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 3	N	7/8/1997	6,859.20	6.80	7.53	5060	933	282	223	7.4	1390	1810	158	0.11	121	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	1.7	< 0.1	< 0.05	< 0.001	< 0.1	0.061	0.4	< 1	0.4	< 0.2	< 1	< 1
GW 3	N	10/7/1997	6,859.40	6.20	7.44	5010	879	267	231	6.9	1370	1870	155	< 0.05	114	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	2.19	< 0.1	< 0.05	< 0.001	< 0.1	0.065	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 3	N	1/16/1998	6,859.20	6.70	7.72	4980	858	265	246	8.1	1330	2000	154	0.28	128	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	2	< 0.1	< 0.05	< 0.001	< 0.1	0.0721	1.3	< 1	1.3	< 0.2	< 1	3.8
GW 3	N	4/7/1998	6,859.10	6.60	7.51	4980	895	273	234	6.7	1300	1800	128	0.06	130	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.005	< 0.01	< 0.05	1.79	< 0.1	< 0.05	< 0.001	< 0.1	0.0632	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 3	N	7/7/1998	6,859.00	6.80	7.74	4930	883	276	244	7.8	1200	2100	139	0.1	117	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.005	< 0.01	< 0.05	1.69	< 0.1	< 0.05	< 0.001	< 0.1	< 0.0003	0.5	< 1	0.5	< 0.2	< 1	< 1
GW 3	N	10/6/1998	6,858.60	6.66	7.75	4850	871	268	236	7	1220	1980	134	0.11	220	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.005	< 0.01	< 0.05	1.76	< 0.1	< 0.05	< 0.001	< 0.1	0.0607	0.7	< 1	0.7	< 0.2	< 1	< 1
GW 3	N	1/5/1999	6,858.50	6.80	7.85	3810	671	193	163	8.9	987	1400	95.2	0.21	85.9	< 1	< 0.1	< 0.001	< 0.01	< 0.01	0.007	< 0.01	< 0.05	1.41	< 0.1	< 0.05	< 0.001	< 0.1	0.0475	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 3	N	4/6/1999	6,858.50	6.70	7.64	4600	811	218	202	8.4	1170	1710	131	0.11	103	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.005	< 0.01	< 0.05	1.82	< 0.1	< 0.05	< 0.001	< 0.1	0.0518	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 3	N	7/13/1999	6,858.34	6.70	7.90	4610	824	259	205	12.3	1170	1830	126	0.09	119	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.005	< 0.01	< 0.05	1.69	< 0.1	< 0.05	< 0.001	< 0.1	0.0047	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 3	N	10/5/1999	6,859.30	6.68	7.34	4660	702	219	217	7.5	1170	1680	123	14.8	99	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.005	< 0.01	< 0.05	2.03	< 0.1	< 0.05	< 0.001	< 0.1	0.0569	0.6	< 1	0.6	< 0.2	< 1	< 1
GW 3	N	1/4/2000	6,858.60	6.60	7.83	4680	760	239	169	9.2	1170	1760	106	< 0.05	113	2	< 0.1	< 0.001	< 0.01	< 0.01	< 0.005	< 0.01	< 0.05	1.78	< 0.1	< 0.05	0.001	< 0.1	0.0513	0.5	< 1	0.5	< 0.2	< 1	< 1
GW 3	N	5/15/2000	6,858.00	6.60	7.71	4780	755	241	211	8	1174	1830	127	0.15	119	< 1	< 0.1	0.001	< 0.01	< 0.01	< 0.005	< 0.01	< 0.05	1.87	< 0.1	< 0.05	0.001	< 0.1	0.0568	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 3	N	7/17/2000	6,857.80	6.48	7.51	4800	809	258	207	9.14	1190	1710	125	< 0.05	117	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.005	0.01	< 0.05	1.78	< 0.1	< 0.05	< 0.001	< 0.1	0.056	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 3	N	10/10/2000	6,857.60	6.56	7.60	4680	644	210	179	9	1170	1320	96.4	0.1	118	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.005	< 0.01	< 0.05	1.57	< 0.1	< 0.05	< 0.001	< 0.1	0.058	< 0.2	1.1	1.1	< 0.2	< 1	< 1
GW 3	N	1/9/2001	6,858.00	6.82	7.62	4660	830	265	207	8.5	1210	1850	125	< 0.05	115	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.005	0.01	< 0.05	1.9	< 0.1	< 0.05	0.001	< 0.1	0.056	< 0.2	3.6	3.6	< 0.2	< 1	< 1
GW 3	N	2/6/2001	6,858.30	6.99	7.12	4720	943	290	183	9.7	1220	2120	123	< 0.05	110	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.005	< 0.01	< 0.05	1.91	< 0.1	< 0.05	0.002	< 0.1	0.059	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 3	N	3/6/2001	6,858.70	7.00	7.63	4380	817	263	164	9.3	1180	2040	120	0.16	112	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.005	< 0.01	< 0.05	1.87	< 0.1	< 0.05	0.001	< 0.1	0.0569	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 3	N	4/10/2001	6,859.05	7.26	7.20	4680	945	287	207	9.1	1250	2070	128	0.14	108	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.005	0.01	< 0.05	1.91	< 0.1	< 0.05	0.001	< 0.1	0.057	< 0.2	2.4	2.4	< 0.2	< 1	1.3
GW 3	N	5/8/2001	6,859.10	6.72	7.49	4850	808	256	195	8.9	1250	1730	146	0.15	107	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.005	< 0.01	< 0.05	1.96	< 0.1	< 0.05	0.001	< 0.1	0.06	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 3	N	6/5/2001	6,859.30	6.76	7.25	4230	847	274	194	8.6	1280	1940	136	0.2	97.5	< 1	0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	2.06	< 0.1	< 0.05	0.005	< 0.1	0.058	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 3	N	7/10/2001	6,859.30	6.87	7.10	4980	888	288	244	9	1350	1880	125	0.11	98	< 1	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	2.22	< 0.1	< 0.05	0.001	< 0.1	0.0676	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 3	N	8/7/2001	6,859.32	6.59	7.20	5010	820	270	210	9.4	1390	1800	160	0.11	90.5	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2	< 0.1	< 0.05	< 0.001	< 0.1	0.071	0.4	< 1	0.4	< 0.2	< 1	< 1
GW 3	N	9/11/2001	6,859.50	6.65	7.50	4980	840	270	233	8.9	1400	1810	154	0.1	104	< 1	0.13	< 0.001	< 0.01	< 0.005	0.01	< 0.05	1.99	< 0.1	< 0.05	0.001	< 0.1	0.0655	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 3	N	10/1/2001	6,859.55	6.83	7.40	5010	810	260	224	8.5	1450	1950	169	0.15	92	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.78	< 0.1	< 0.05	0.001	< 0.1	0.0646	0.3	< 1	0.3	< 0.2	< 1	< 1
GW 3	N	11/6/2001	6,859.65	6.79	7.60	5020	886	280	229	9.6	1420	2050	173	0.08	88	< 1	0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.91	< 0.1	< 0.05	< 0.001	< 0.1	0.0632	0.4	< 1	0.4	< 0.2	< 1	< 1
GW 3	N	12/4/2001	6,859.80	6.95	7.40	5020	833	260	201	8.2	1440	1720	148	0.11	91	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.93	< 0.1	< 0.05	< 0.001	< 0.1	0.0726	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 3	N	1/8/2002	6,859.80	6.90	7.20	5050	983	293	192	10.2	1440	2200	171	0.09	86.5	< 1	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	1.79	< 0.1	< 0.05	< 0.001	< 0.1	0.0635	0.3	1.5	1.8	< 0.2	< 1	< 1
GW 3	N	2/5/2002	6,859.80	6.91	7.20	5110	960	281	219	9.5	1440	2080	165	0.11	82.3	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.89	< 0.1	< 0.05	< 0.001	< 0.1	0.0586	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 3	N	3/5/2002	6,859.85	6.77	7.40	5090	914	283	246	8.9	1490	2160	160	0.09	84.3	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.34	< 0.1	< 0.05	< 0.001	< 0.1	0.0805	0.5	< 1	0.5	< 0.2	< 1	< 1
GW 3	N	4/2/2002	6,859.90	6.76	7.59	5240	968	291	236	10.5	1480	2110	168	0.1	83.6	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.08	< 0.1	< 0.05	< 0.001	0.1	0.0704	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 3	N	5/7/2002	6,859.92	6.51	7.44	5320	953	288	250	10.2	1510	2120	159	0.08	82.4	< 1	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	2.18	< 0.1	< 0.05	< 0.001	< 0.1	0.08	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 3	N	6/4/2002	6,859.95	6.68	7.67	5330	958	293	236	8	1520	2110	148	0.1	83.4	< 1	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	1.97	< 0.1	< 0.05	< 0.001	< 0.1	0.0789	0.4	< 1	0.4	< 0.2	< 1	< 1
GW 3	N	7/9/2002	6,859.65	6.71	7.38	5430	953	302	157	8.8	1560	2170	127	0.24	93.2	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.79	< 0.1	< 0.05	< 0.001	< 0.1	0.0934	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 3	N	10/7/2002	6,859.50	6.64	7.35	4510	884	276	223	8	1620	2030	150	0.22	83.8	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.95	< 0.1	< 0.05	< 0.001	< 0.1	0.0713	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 3	N	1/7/2003	6,859.82	6.67	7.39	5530	981	312	274	9.6	1710	2210	154	0.24	86	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.05	< 0.1	< 0.05	< 0.001	< 0.1	0.111	< 0.2	< 1	0	< 0.2	< 1	< 1.0
GW 3	N	4/8/2003	6,859.84	6.60	7.30	5540	940	282	256	10.9	1680	1900	165	0.23	98	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.01	< 0.1	< 0.05	< 0.001	< 0.1	0.106	0.4	4	4.4	< 0.2	< 1	< 1.0
GW 3	N	7/8/2003	6,859.59	6.45	7.46	5480	866	276	234	9.9	1700	2000	143	0.21	94	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.005	0.02	< 0.05	1.93	< 0.1	< 0.05	< 0.001	< 0.1	0.0866	< 0.2	< 1	0	< 0.2	< 1	< 1.0
GW 3	N	10/7/2003	6,859.53	6.46	7.30	5490	988	327	280	8.6	1740	2220	171	0.19	89	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.87	< 0.1	< 0.05	< 0.001	< 0.1	0.104	< 0.2	< 1	0	< 0.2	< 1	< 1.0
GW 3	N	1/6/2004	6,859.61	6.63	7.27	5380	951	317	242	8.5	1700	2170	183	0.38	89.4 D	< 1.0	0.2	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	2.13	< 0.1	< 0.05	< 0.001	< 0.1	0.0908 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
GW 3	N	4/6/2004	6,859.76	6.81	6.82	5410	924	309	239	8.6	1680	2070 D	157	0.29	86.7 D	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.91	< 0.1	< 0.05	0.001	< 0.1	0.097 D	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 3	N	7/13/2004	6,859.49	6.44	6.80	5580	968	316	278	9.8	1720	2110 D	172	0.24	82.6 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	1.74	< 0.1	< 0.05	< 0.001	< 0.1	0.104 D	0.3	< 1.0	0.3	< 0.2	< 1.0	< 1.0
GW 3	N	10/5/2004	6,859.28	6.50	7.07	5720	935 D	315 D	272	8	1680	2080 D	165	0.06	80.0 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.76	< 0.1	< 0.05	< 0.001	< 0.1	0.107 D	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
GW 3	N	1/4/2005	6,859.49	6.68	7.05	5560	960 D	316 D	281	8.9	1730	2050 D	171	0.17	86 D	< 1.0	0.4	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.88	< 0.1	< 0.05	< 0.001	< 0.1	0.116	0.2	< 1.0	0.2	< 0.2	< 1.0	2.6
GW 3	N	4/5/2005	6,859.37	6.68	7.10	5270	968	328	283	8.2	1550	2130	168	0.09	71	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.84	< 0.1	< 0.05	< 0.001	< 0.1	0.112	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
GW 3	N	7/12/2005	6,859.09	6.51	7.10	5190	970 D	319 D	268	7.8	1640	2110 D	170	0.09	77 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.88	< 0.1	< 0.05	< 0.001	< 0.1	0.107	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
GW 3	N	10/4/2005	6,858.90	6.52	7.26	5270	926 D	314 D	275	8.6	1680	2120 D	178	0.11	78 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	1.78	< 0.1	< 0.05	< 0.001	< 0.1	0.118	< 0.2	1.4	1.4	< 0.2	< 1.0	< 1.0
GW 3	N	1/10/2006	6,858.96	6.65	7.62	5100	843	285	272	6.4	1650	1940 D	152	< 0.05	90 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.81	< 0.1	< 0.05	< 0.001	< 0.1	0.115	< 0.2	1.1	1.1	< 0.2	< 1.0	< 1.0
GW 3	N	4/4/2006	6,859.04	6.55	7.14	5300	977 D	337 D	258	9	1460	2150 D	183	0.24	94 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	1.79	< 0.1	< 0.05	< 0.001	< 0.1	0.0975 D	< 0.2	2.3	2.3	< 0.2	< 1.0	< 1.0
GW 3	N	7/18/2006	6,858.64	6.33	6.88	5290	978 D	328 D	293	10.2	1580	2360 D	167	0.07	91 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	1.81	< 0.1	< 0.05	< 0.001	< 0.1	0.117	0.4	1.8	2.2	< 0.2	< 1.0	< 1.0
GW 3	N	10/3/2006	6,858.59	6.44	6.78	5070	865 D	289 D	253	9	1590	1920 D	149	0.16	100 D	< 0.5	0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.85	< 0.1	< 0.05	< 0.001	< 0.1	0.112	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 3	N	1/9/2007	6,858.82	6.58	6.82	5270	867 D	291 D	248	8.7	1550	2170 D	164	0.27	90 D	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.76	<0.1	<0.05	<0.001	<0.1	0.112	<0.2	<1	0	<0.2	<1	<1
GW 3	N	4/10/2007	6,858.87	6.68	6.85	5170	882 D	292 D	254	10.2	1540	2050 D	156	0.05	97 D	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.62	<0.1	<0.05	<0.001	<0.1	0.113	<0.2	<1	0	<0.2	<1	<1
GW 3	N	7/10/2007	6,858.44	6.48	6.67	5110	927 D	313 D	280	8.9	1630	2280 D	141	0.09	101 D	<0.5	<0.1	0.01	<0.01	<0.005	<0.01	<0.05	1.13	<0.1	<0.05	<0.001	<0.1	0.13	<0.2	<1	0	<0.2	<1	<1
GW 3	N	10/2/2007	6,858.27	6.50	6.67	5150	812 D	267 D	280 D	10	1580	1970 D	176 D	<0.05	94 D	<0.5	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.68	<0.1	<0.05	<0.001	<0.1	0.136	<0.2	<1	0	<0.2	<1	1.2
GW 3	N	1/15/2008	6,858.44	6.62	6.73	5250	849 D	275 D	282 D	9.9	1530	1970 D	177 D	< 0.05	88 D	< 0.5	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.42	< 0.1	< 0.05	< 0.001	< 0.1	0.123	< 0.2	< 1	0	< 0.2	< 1	< 1

TABLE A.1
Southwest Alluvium Data Summary, 1989-2019
United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
GW 3	N	4/8/2008	6,858.59	6.56	6.75	4970	945 D	311 D	318 D	10.6 D	1450	2250 D	139	< 0.1	143 D	< 0.50	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.61	< 0.1	< 0.05	< 0.001	< 0.1	0.13	0.1 U	-0.1 U	0	-0.3 U	0 U	2.1
GW 3	N	7/8/2008	6,858.19	6.28	6.69	5130	917	279	282 D	9	1500	2210 D	156	< 0.05	95.3 D	< 0.5	0.2	< 0.003	< 0.01	< 0.005	< 0.01	< 0.05	1.82	< 0.1	< 0.05	< 0.001	< 0.1	0.133	0.22	0.83 U	1.05	0.1 U	1.3 U	1.1
GW 3	N	10/7/2008	6,857.79	6.59	6.91	5080	918	288	296 D	8	1450	2390 D	149	< 0.1	138 D	< 0.5	0.8	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	1.66	< 0.1	< 0.05	< 0.001	< 0.1	0.118	0.05 U	1.2 U	1.25	0 U	2.6 U	1.7
GW 3	N	1/13/2009	6,857.89	6.55	6.62	5430	964	304	324	9	1410	1980 D	159	<0.05	165 D	<0.5	0.4	<0.001	<0.01	<0.005	<0.01	<0.05	1.46	<0.1	<0.05	<0.001	<0.1	0.126	0.02 U	-0.2 U	-0.18	0.7 U	-1 U	1.9
GW 3	N	4/7/2009	6,857.74	6.53	6.56	5250	860 D	282 D	298 D	8	1430	2190 D	180	<0.05	115 D	<0.50	1.4	<0.001	<0.01	<0.005	<0.01	<0.05	1.46	<0.1	<0.05	0.001	<0.1	0.145	0.04 U	0.67 U	0.71	0.2 U	0.7 U	0.7
GW 3	N	7/7/2009	6,857.59	6.48	6.86	5370	858	276	282	8	1410	2140 D	193	0.05	114 D	<0.50	0.5	<0.001	<0.01	<0.005	<0.01	<0.05	1.47	<0.1	<0.05	<0.001	<0.1	0.125	0.35	0.45 U	0.8	-0.02 U	0.0 U	2.3
GW 3	N	10/6/2009	6,857.14	6.38	7.37	5430	889 D	281	283 D	8	1430	2240 D	201	<0.05	124 D	<0.50	1.5	<0.001	<0.01	<0.005	<0.01	<0.05	1.52	<0.1	<0.05	<0.001	<0.1	0.151	0.25	0.26 U	0.51	0.04 U	1.6 U	0.7 U
GW 3	N	1/5/2010	no data	no data	6.94	5470 D	914 D	276	316	8	1460	2420 D	92	<0.05	130 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.51	<0.1	<0.05	<0.001	<0.1	0.142	-0.2 U	0.39 U	0.19	-0.009 U	0.2 U	0.7
GW 3	N	4/6/2010	6,857.14	6.64	6.63	5390 D	935 D	283	306 D	9	1530	2330 D	191	<0.05	111 D	<0.50	<0.1	<0.001	<0.01	<0.005	<0.01	<0.05	1.47	<0.1	<0.05	<0.001	<0.1	0.158	0.25	0.94 U	1.19	0.02 U	3.2	1.1
GW 3	N	7/13/2010	6,856.89	6.40	6.88	5380 D	912	280	330	9	1580	2250 D	169 D	<0.05	100 D	<0.50	<0.1	<0.001	<0.01	<0.005	0.01	<0.05	1.96	<0.1	<0.05	<0.001	<0.1	0.194	-0.05 U	-0.06 U	-0.11	0.01 U	-0.2 U	0.4 U
GW 3	N	10/5/2010	6,856.54	6.59	7.18	5420 D	890	272	336	9	1590	2240 D	166 D	0.09	100 D	<0.50	0.8	<0.001	<0.01	<0.005	0.01	<0.05	1.64	<0.1	<0.05	<0.001	<0.1	0.215	0.06 U	2.2	2.26	-0.02 U	2.7	0.4 U
GW 3	N	1/4/2011	6,856.54	6.55	7.69	5090 D	870	273	324	9	1550	2200 D	174 D	0.05	86 D	<0.50	0.1	<0.001	<0.01	<0.005	0.01	<0.05	1.58	<0.1	<0.05	<0.001	<0.1	0.199	0.10 U	2.7	2.8	0.06 U	0.3 U	0.02 U
GW 3	N	4/5/2011	6,856.49	6.59	6.71	5480 D	873	270	352	9	1600	2220 D	171 D	<0.05	72 D	<0.50	1.1	<0.001	<0.01	<0.005	0.01	<0.05	1.7	<0.1	<0.05	<0.001	<0.1	0.212	-0.05 U	1.1	1.05	0.08 U	0.1 U	0.3 U
GW 3	N	7/12/2011	6,856.29	6.61	6.84	5310 D	906	280	353	9	1620	2210 D	168 D	<0.1	97 D	<0.50	0.2	<0.001	<0.01	<0.005	0.01	<0.05	1.64	<0.1	<0.05	<0.001	<0.1	0.236	-0.06 U	0.43 U	0.37	0.009 U	0.1 U	0.8 U
GW 3	N	10/4/2011	6,855.94	6.71	7.54	5230 D	896	276	344	9	1550	2240 D	170 D	<0.1	91 D	<0.50	0.4	0.013	<0.01	<0.005	<0.01	<0.05	1.65	<0.1	<0.05	0.003	<0.1	0.22	0.05 U	0.69 U	0.74	0.02 U	-0.3 U	0.4 U
GW 3	N	1/3/2012	6,855.93	6.84	6.82 H	5050 D	946	292	342	10	1380	2180 D	167 D	<0.05	89 D	<0.50	0.2	<0.001	<0.01	<0.005	<0.01	<0.05	1.06	<0.1	<0.05	0.002	<0.1	0.256	0.37	0.54 U	1.45	-0.004 U	0.09 U	0.4 U
GW 3	N	4/3/2012	6,855.84	6.65	6.61 H	5480 D	903	270	315	9	1640	2210 D	167 D	<0.05	88 D	<0.50	<0.1	<0.01	<0.01	<0.005	<0.01	<0.05	1.38	<0.1	<0.05	<0.001	<0.1	0.274	0.10 U	0.18 U	0.46	0.08 U	0.5 U	0.07 U
GW 3	N	7/10/2012	6,855.54	6.96	6.61 H	5510	917	296	332	8	1680	2270 D	172 D	0.09	205 D	<0.50	0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.62	<0.1	<0.05	<0.001	<0.1	0.324	0.22	0.46 U	1.14	0.02 U	0.8 U	0.1 U
GW 3	N	10/9/2012	6,855.29	6.58	6.64 H	5330	937	284	328 D	9	1710	2280 D	177 D	<0.05	87 D	<0.50	0.2	<0.001	<0.001	<0.005	0.01	<0.001	1.75	<0.1	<0.05	<0.001	<0.1	0.295	0.08 U	0.85 U	0	0.09 U	-0.4 U	0.05 U
GW 3	N	1/14/2013	6,855.32	6.79	6.61 H	5410	975	310	344 D	9	1660	2330 D	172 D	0.11	82 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.33	<0.1	<0.05	<0.001	<0.1	0.306	0.09 U	0.39 U	0	0.0 U	0.5 U	0.08 U
GW 3	N	4/2/2013	6,855.22	6.62	6.69 H	5280	962	303	328	9	1620	2180 D	166 D	<0.05	86 D	<0.50	2.3	<0.001	<0.001	<0.005	<0.01	0.003	1.45	<0.1	<0.05	<0.001	<0.1	0.311	0.14	-0.2 U	0.14	0.09 U	0.9 U	1
GW 3	N	7/9/2013	6,854.94	6.44	6.72 H	5460	931	312	337	9	1720	2270 D	167 D	<0.05	84 D	<0.50	2	<0.001	<0.001	<0.005	0.01	0.002	1.48	<0.1	<0.05	<0.001	<0.1	0.308	0.12 U	0.72 U	0	0.1 U	0.8 U	0.6 U
GW 3	N	10/1/2013	6,855.09	6.53	6.61 H	5290	950	305	323	9	1790	2280 D	166 D	<0.05	81 DH	<0.50	0.7	<0.001	<0.001	<0.005	<0.01	0.001	1.7	<0.1	<0.05	<0.001	<0.1	0.378	0.22	1.6	1.82	0.009 U	0.1 U	0.08 U
GW 3	N	1/7/2014	6,854.86	6.84	6.63	5380	897	299	313	8	1780	2280	168	<0.05	83	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.61	<0.1	<0.05	<0.001	<0.1	0.358	0.33	1.1 U	0.33	-0.005 U	0.2 U	0.4 U
GW 3	N	4/1/2014	6,854.83	6.71	6.73 H	5330	935	310	334 D	9	1780	2290 D	172 D	0.07	77 D	<0.50	0.2	<0.001	<0.001	<0.005	<0.01	<0.001	1.56	<0.1	<0.05	<0.001	<0.1	0.365	0.22	0.82 U	0.22	0.02 U	0.9 U	0.1 U
GW 3	N	7/8/2014	6,854.55	6.63	6.64 H	5500	864	335	334 D	9	1780	2280 D	165 D	<0.05	80 D	<0.50	1.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.61	<0.1	<0.05	<0.001	<0.1	0.32	0.24	0.14 U	0.24	0.01 U	-0.3 U	0.2 U
GW 3	N	10/7/2014	6,854.46	6.76	6.63 H	5400	835	301	297	8	1680	2250 D	162 D	<0.05	84 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.22	<0.1	<0.05	<0.001	<0.1	0.371	0.18 U	1.6	1.6	0.03 U	0.009 U	-0.03 U
GW 3	N	1/6/2015	6,854.48	6.89	6.64 H	5460	856	304	290	8	1740	2330 D	187 D	<0.05	84 D	<0.50	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.25	<0.1	<0.05	<0.001	<0.1	0.392	0.11 U	0.43 U	0	0.01 U	-0.3 U	1.1 U
GW 3	N	4/7/2015	6,854.27	6.65	6.87 H	5520	903	308	296	9	1790	2250 D	178 D	<0.05	85 D	<0.5	<0.1	<0.001	<0.001	<0.005	<0.01	<0.001	1.32	<0.1	<0.05	<0.001	<0.1	0.365	0.31	0.35 U	0.31	0.3	-0.6 U	0.5 U
GW 3	N	7/7/2015	6,854.04	6.61	6.86 H	5370	904	301	276	11	1670	2310 D	169 D	<0.05	93 D	<0.50	1.1	<0.001	<0.001	<0.005	<0.01	0.002	1.55	<0.1	<0.05	0.001	<0.1	0.423	0.12	0.21 U	0.12	0.05 U	1.2	0.6 U
GW 4	N	7/18/1989	6,915.60	6.90	7.19	4068	714	216	212	14.4	756	1842	47	0.27	148	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.14	< 0.1	< 0.05	0.006	< 0.1	0.0901	1.6	< 1	1.6	8.3	< 1	5.5
GW 4	N	10/12/1989	6,915.00	7.20	7.48	4078	680	202	202	18	793	1822	50.2	0.21	134	< 1	0.12	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.04	< 0.1	< 0.05	0.008	< 0.1	0.077	1.2	< 1	1.2	< 0.2	1.1	2
GW 4	N	1/4/1990	6,914.60	7.20	7.28	4036	728	222	198	14.1	775	1780	51.7	0.11	134	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.05	< 0.1	< 0.05	0.005	< 0.1	0.077	2.9	< 1	2.9	< 0.2	< 1	3.1
GW 4	N	4/3/1990	6,913.60	7.10	7.40	4193	740	212	194	14	789	1707	52.4	0.09	120	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.03	< 0.1	< 0.05	0.006	< 0.1	0.077	1	< 1	1	0.4	< 1	1.7
GW 4	N	7/2/1990	6,912.70	6.80	7.30	4326	830	214	167	13.8	866	1651	54.7	< 0.05	176	< 1	< 0.1	< 0.001	< 0.05	< 0.01	< 0.01	< 0.05	0.02	< 0.1	< 0.05	0.004	< 0.1	0.0756	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 4	N	10/3/1990	6,912.40	6.90	7.31	4135	699	198	198	14.4	732	1610	56.2	< 0.05	116	< 1	< 0.1	0.001	< 0.05	< 0.01	0.02	< 0.05	0.11	< 0.1	< 0.05	< 0.001	< 0.1	0.059	< 0.2	2.7	2.7	< 0.2	< 1	< 1
GW 4	N	1/15/1991	6,912.40	7.00	7.29	4064	759	213	189	13.3	731	1678	54.6	< 0.05	176	< 1	0.24	< 0.001	< 0.01	< 0.01	0.01	< 0.05	0.04	< 0.1	< 0.05	0.004	< 0.1	0.0647	0.8	< 1	0.8	< 0.2	< 1	1.2
GW 4	N	4/2/1991	6,912.70	7.10	7.59	3990	641	183	180	12.4	550	1660	46.3	< 0.05	162	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.08	< 0.1	< 0.05	0.005	< 0.1	0.048	< 0.2	< 1	0	< 0.2	2.2	< 1
GW 4	N	7/17/1991	6,914.40	7.10	7.55	3981	578	190	164	12.9	527	1703	41.2	0.08	132	< 1	< 0.1	0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.14	< 0.1	< 0.05	0.008	< 0.1	0.044	0.2	< 1	0.2	< 0.2	< 1	< 1
GW 4	N	10/15/1991	6,913.80	7.00	7.26	3880	698	214	165	13.4	732	1826	43.8	< 0.05	67.6	< 1	< 0.1	0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.14	< 0.1	< 0.05	0.008	< 0.1	0.044	1.2	< 1	1.2	< 0.2	< 1	< 1
GW 4	N	1/15/1992	6,913.10	7.00	7.03	3779	619	189	163	11.8	623	1803	38.7	< 0.05	77.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.1	< 0.1	< 0.05	0.006	< 0.1	0.124	< 0.2	1.9	1.9	< 0.2	< 1	< 1
GW 4	N	4/7/1992	6,912.20	7.00	7.19	3334	579	177	185	14.1	602	1621	38.7	0.06	78.2	< 1	< 0.1	0.004	< 0.01	< 0.01	< 0.01	< 0.05	0.06	< 0.1	< 0.05	0.019	< 0.1	0.07	< 0.2	7.1	7.1	< 0.2	6.3	< 1
GW 4	N	7/8/1992	6,911.50	7.00	7.59	3505	661	190	233	14.7	636	1663	40.7	0.2	108	< 1	< 0.1	0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.05	< 0.1	< 0.05	0.004	< 0.1	0.047	< 0.2	2.6	2.6	< 0.2	< 1	< 1
GW 4	N	10/6/1992	6,910.90	7.10	7.35	3857	762	204	187	13.2	585	1727	42	< 0.05	162	< 1	0.1	0.002	< 0.01	< 0.01	< 0.01	< 0.05	0.05	0.1	< 0.05	0.016	< 0.1	0.086	0.3	< 1	0.3	< 0.2	< 1	< 1
GW 4	N	1/6/1993	6,910.40	7.10	7.72	3595	667	175	180	12.6	714	1454	49.1	0.13	138	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.06	< 0.1	< 0.05	0.015	< 0.1	0.111	2.3	< 1	2.3	< 0.2	< 1	5.1
GW 4	N	4/6/1993	6,910.30	7.20	7.63	3898	665	177	192	10.6	736	1694	51.2	< 0.05	137	< 1	< 0.1	0.001	< 0.005	< 0.01	0.01	< 0.05	0.05	< 0.1	< 0.05	0.01	< 0.1	0.081	0.3	< 1	0.3	< 0.2	2.8	< 1
GW 4	N	7/13/1993	6,910.50	7.10	7.13	4181	727	195	168	12.6	755	1820	47	0.1	125	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.04	< 0.1	< 0.05	0.016	< 0.1	0.064	0.2	< 1	0.2	< 0.2	3.2	< 1
GW 4	N	10/6/1993	6,910.60	7.30	7.45	4081	694	177	170	11.3	780	1700	42.1	< 0.05	124	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.05	< 0.1	< 0.05	0.007	< 0.1	0.073	< 0.2	1.3	1.3	< 0.2	1.2	1.9
GW 4	N	1/6/1994	6,911.60	7.20	7.71	3798	656	169	171	10.7	798	1689	40.2	0.17	82.4	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.08	< 0.1	< 0.05	0.007	< 0.1	0.052	3.3	3.3	6.6	< 0.2	1.6	10.6
GW 4	N	4/13/1994	6,911.70	7.10	7.20	3682	658	170	157	11.1	752	1688	39.1	0.3	109	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.04	< 0.1	< 0.05	0.004	< 0.1	0.067	0.9	< 1	0.9	< 0.2	6.8	< 1
GW 4	N	7/20/1994	6,910.80	7.10	7.09	3676	727	195	157	12	733	1729	40.1	0.18	110	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.02	< 0.1	< 0.05	0.007	< 0.1	0.067	0.5	14.8	15.3	< 0.2	< 1	22.9
GW 4	N	10/4/1994	6,910.70	7.10	7.78	3849	721	198	181	12	712	1796	45.6	0.13	119	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.1	< 0.05	0.004	< 0.1	0.087	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 4	N	1/5/1995	6,910.30	7.10	7.42	3937	746	192	168	13	738	1697	45.6	0.22	122	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.07	< 0.1	< 0.05	0.002	< 0.1	0.062	1.1	< 1	1.1	< 0.2	< 1	1.3
GW 4	N	4/4/1995	6,910.40	7.20	7.47	3989	790	216	182	12.8	805	1844	49	0.44	141	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.04	< 0.1	< 0.05	0.005	< 0.1	0.072	0.6	< 1	0.6	< 0.2	< 1	< 1
GW 4	N	7/6/1995	6,909.40	7.20	7.63	3957	740	207	183	15.2	610	1740	58	0.85	141	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.09	< 0.1	< 0.05	0.012	< 0.1	0.0374	0.9	< 1	0.9	0.4	< 1	< 1
GW 4	N	10/3/1995	6,909.20	7.10	7.82	4277	715	213	172	12.6	630	1692	51	3.01	165	< 1	< 0.1	0.004	< 0.01	< 0.01	< 0.01	< 0.05	0.09	< 0.1	< 0.05	0.019	< 0.1	0.0711	0.3	< 1	0.3	< 0.2	< 1	1.3
GW 4	N	1/2/1996	6,909.20	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
GW 4	N	4/2/1996	6,909.20	7.10	7.83	4092	718	193	166	12.4	706	1688	46.6	0.37	146	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.02	< 0.1	< 0.05	< 0.001	< 0.1	0.065	0.3	< 1	0.3	< 0.2	< 1	< 1
GW 4	N	7/9/1996	6,908.60	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data

TABLE A.1
Southwest Alluvium Data Summary, 1989-2019
United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
GW 4	N	10/1/1996	6,908.50	6.90	7.66	3900	743	194	165	12.1	806	1671	44	0.28	126	< 1	0.19	0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.08	< 0.1	< 0.05	0.007	< 0.1	0.063	0.8	< 1	0.8	0.8	< 1	< 1
GW 4	N	1/22/1997	6,908.60	6.60	7.70	3490	740	195	146	11.1	773	1739	48	0.1	116	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.07	< 0.1	< 0.05	0.003	< 0.1	0.06	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 4	N	4/8/1997	6,908.50	7.20	7.75	3840	744	196	149	11.3	680	1734	46	0.07	119	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.1	< 0.1	< 0.05	0.274	< 0.1	0.066	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 4	N	7/8/1997	6,908.80	7.30	7.77	3890	730	192	144	11	667	1710	46.2	0.12	111	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.12	< 0.1	< 0.05	< 0.001	< 0.1	0.063	2.6	< 1	2.6	< 0.2	< 1	2.9
GW 4	N	10/7/1997	6,909.60	6.70	7.70	3950	736	183	153	11.3	798	1610	44	0.06	106	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.16	< 0.1	< 0.05	0.004	< 0.1	0.066	0.5	< 1	0.5	< 0.2	< 1	< 1
GW 4	N	1/16/1998	6,910.50	7.20	7.94	3880	712	188	162	12.1	817	1800	44.2	0.22	105	< 1	< 0.1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.05	0.04	< 0.1	< 0.05	0.005	< 0.1	0.0714	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 4	N	4/7/1998	6,910.50	7.00	7.69	3890	715	192	153	11.3	777	1600	35	< 0.05	95.6	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.1	< 0.1	< 0.05	0.037	< 0.1	0.0729	0.5	< 1	0.5	< 0.2	< 1	< 1
GW 4	N	7/7/1998	6,910.30	7.20	7.80	3870	700	190	163	11.8	797	1600	38.7	0.12	86.9	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.09	< 0.1	< 0.05	0.024	< 0.1	0.0734	0.5	< 1	0.5	< 0.2	< 1	< 1
GW 4	N	10/6/1998	6,910.20	7.18	7.92	3840	714	198	165	13	670	1780	42.4	0.28	105	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.21	< 0.1	< 0.05	0.005	< 0.1	0.0782	< 0.2	< 1	0	< 0.2	< 1	< 1
GW 4	N	1/5/1999	6,910.00	7.30	7.78	3810	650	182	151	11.3	622	1620	41.4	0.13	75.7	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.11	< 0.1	< 0.05	0.009	< 0.1	0.0744	1.2	< 1	1.2	< 0.2	< 1	< 1
GW 4	N	4/6/1999	6,910.40	7.20	7.99	3810	675	179	146	11.5	644	1620	50.1	0.26	100	< 1	< 0.1	< 0.001	< 0.01	< 0.005	< 0.01	< 0.05	0.1	< 0.1	< 0.05	0.007	< 0.1	0.0715	0.8	< 1	0.8	< 0.2	< 1	< 1
GW 4	N	7/13/1999	6,909.25	7.20	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	< 1	no data
SBL-01	N	10/18/2004	6,847.15	6.91	7.27	8450	572 D	1070 D	368	15.3	251	5390 D	96	0.43	94 D	< 1.0	0.4	< 0.001	< 0.01	< 0.005	0.06	< 0.05	3.35	< 0.1	0.17	< 0.001	< 0.1	0.0267 D	0.4	2.8	3.2	< 0.2	< 1.0	< 1.0
SBL-01	N	1/12/2005	6,847.11	6.86	6.99	8940	564 D	984 D	399	12.4	373	5340 D	97	0.22	39.0 D	< 1.0	0.2	< 0.001	< 0.01	< 0.005	0.02	< 0.05	2.38	< 0.1	0.08	< 0.001	< 0.1	0.0289 D	1.1	2.4	3.5	< 0.2	< 1.0	< 1.0
SBL-01	N	4/5/2005	6,846.53	6.95	7.51	8870	553	1010	390	12.3	424	5470	93	0.06	35.8	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	2.28	< 0.1	0.07	< 0.001	< 0.1	0.0332	< 0.2	< 1.0	0	< 0.2	< 1.0	< 1.0
SBL-01	N	7/12/2005	6,846.35	6.84	7.53	8860	466 D	896 D	384	12.4	432	5120	97	0.29	35.7 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	2.3	< 0.1	0.06	< 0.001	< 0.1	0.0327	0.7	< 1.0	0.7	< 0.2	< 1.0	< 1.0
SBL-01	N	10/4/2005	6,846.49	6.65	7.25	8520	537 D	981 D	357	12.6	387	5360 D	103	0.17	41.4 D	< 1.0	0.1	< 0.001	< 0.01	< 0.005	0.03	< 0.05	2.25	< 0.1	0.08	< 0.001	< 0.1	0.0241 D	< 0.2	3.5	3.5	< 0.2	< 1.0	< 1.0
SBL-01	N	1/10/2006	6,846.50	6.79	7.21	8270	497	871 D	344	10.6	580	4880 D	91	0.36	45.7 D	< 1.0	0.2	< 0.001	< 0.01	< 0.005	0.03	< 0.05	2.16	< 0.1	0.08	0.003	< 0.1	0.0249	0.8	2.6	3.4	< 0.2	< 1.0	1.3
SBL-01	N	4/4/2006	6,846.41	6.73	7.41	9200	560 D	1150 D	329	13.6	461	5710 D	101	0.36	41 D	< 1.0	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	2.52	< 0.1	0.05	< 0.001	< 0.1	0.0238 D	< 0.2	1.1	1.1	< 0.2	< 1.0	< 1.0
SBL-01	N	7/18/2006	6,846.36	6.61	7.13	8400	552 D	1080 D	345	13	378	5830 D	90	0.09	43 D	< 1.0	0.2	< 0.001	< 0.01	< 0.005	0.02	< 0.05	2.4	< 0.1	0.08	< 0.001	< 0.1	0.0227	0.6	4.7	5.3	< 0.2	< 1.0	< 1.0
SBL-01	N	10/3/2006	6,846.41	6.62	7.18	8820	520 D	1020 D	314	13	388	5320 D	78	0.27	45 D	< 0.5	0.3	< 0.001	< 0.01	< 0.005	0.02	< 0.05	2.47	< 0.1	0.08	< 0.001	< 0.1	0.0216 D	0.4	1.5	1.9	< 0.2	< 1	< 1
SBL-01	N	1/9/2007	6,846.24	6.79	7.00	8790	498 D	1010 D	288	12.8	427	5160 D	80	0.19	53 D	<0.5	0.2	<0.001	<0.01	<0.005	0.03	<0.05	2.42	<0.1	0.07	<0.001	<0.1	0.0176	0.4	<1	0.4	<0.2	<1	<1
SBL-01	N	4/10/2007	6,846.46	6.94	6.98	8830	508 D	1040 D	293	15.5	439	5380 D	87	0.08	50 D	<0.5	0.1	<0.001	<0.01	<0.005	0.02	<0.05	2.57	<0.1	0.07	<0.001	<0.1	0.0176	<0.2	2.2	2.2	<0.2	<1	<1
SBL-01	N	7/10/2007	6,846.16	6.67	6.93	8960	542 D	1090 D	326	13.3	461	5740 D	81	0.17	50 D	<0.5	<0.1	0.008	<0.01	<0.005	0.03	<0.05	2.28	<0.1	0.1	<0.001	<0.1	0.0192	<0.2	<1	0	<0.2	<1	<1
SBL-01	N	10/2/2007	6,846.21	6.54	6.92	8670 H	470 D	988 D	296 D	14	429	4960 D	102 D	0.32	49 D	<0.5	0.2	<0.001	<0.01	<0.005	0.03	<0.05	2.7	<0.1	0.08	<0.001	<0.1	0.0259	<0.2	<1	0	2	<1	1.1
SBL-01	N	1/15/2008	6,846.36	6.89	6.97	9470	524 D	1190 D	321 D	16.6	454	5400 D	112 D	< 0.05	40 D	< 0.5	< 0.1	< 0.001	< 0.01	< 0.005	0.01	< 0.05	2.69	< 0.1	0.06	< 0.001	< 0.1	0.0166 D	< 0.2	< 1	0	< 0.2	< 1	1.7
SBL-01	N	4/8/2008	6,846.21	6.56	7.09	8860	534 D	1200 D	341 D	15.8 D	432	6080 D	82	< 0.1	68.5	< 0.50	0.2	< 0.001	< 0.01	< 0.005	0.02	< 0.05	2.93	< 0.1	0.08	< 0.001	< 0.1	0.0174	0.3	0.9 U	1.2	-0.4 U	-4.5 U	1.6
SBL-01	N	7/8/2008	6,846.11	6.42	6.97	9080	502	1080	284 D	12	443	5680 D	82	< 0.05	47 D	< 0.5	0.2	< 0.003	< 0.01	< 0.005	0.03	< 0.05	2.96	< 0.1	0.09	< 0.001	< 0.1	0.0152	0.56	2.1	2.66	0.6	0.7 U	0.9
SBL-01	N	10/7/2008	6,846.10	6.67	7.11	8890	504	1120	294 D	13	442	5980 D	67	0.2	53.6	< 0.5	< 0.1	< 0.001	< 0.01	< 0.005	0.02	< 0.05	2.79	< 0.1	0.06	< 0.001	< 0.1	0.0163	0.29	2.2	2.49	0.6	-0.8 U	1.5
SBL-01	N	1/13/2009	6,846.01	6.77	6.90	9480	523	1210	360	14	460	5780 D	67	<0.05	61.8 D	<0.5	<0.1	<0.001	<0.01	<0.005	0.02	<0.05	3.42	<0.1	0.06	<0.001	<0.1	0.0172	0.28	1.3 U	1.58	0.1 U	-1 U	1.6
SBL-01	N	4/7/2009	6,845.96	6.64	6.82	9410	498 D	1190 D	325 D	13	473	5910 D	81	<0.05	41.8 D	<0.50	0.2	<0.001	<0.01	<0.005	0.02	<0.05	3.21	<0.1	0.06	0.001	<0.1	0.018	0.38	1.5	1.88	0.4 U	-0.8 U	0.6 U
SBL-01	N	7/7/2009	6,845.96	6.61	6.91	8490	502 D	1040	288 D	13	444	5700 D	81	<0.05	48 D	<0.50	0.6	<0.001	<0.01	<0.005	0.04	<0.05	3.27	<0.1	0.11	<0.001	<0.1	0.0126	0.72	2	2.72	-0.5 U	-1 U	1.4
SBL-01	N	10/5/2009	6,846.11	6.63	7.45	9000	469 D	1120	285 D	13	446	5960 D	88	<0.05	43 D	<0.50	0.1	<0.001	<0.01	<0.005	0.02	<0.05	3.15	<0.1	0.07	<0.001	<0.1	0.0142	1.1	1.8	2.9	0.003 U	1.0 U	0.4 U
SBL-01	N	1/5/2010	6,845.86	6.70	7.33	9400 D	482 D	1140	312 D	13	489	6050 DH	78	0.09	46 D	<0.50	0.1	<0.001	<0.01	<0.005	0.02	<0.05	3.02	<0.1	0.07	<0.001	<0.1	0.0139	0.4	2.1	2.5	0.08 U	-0.5 U	0.8
SBL-01	N	4/6/2010	6,845.91	6.63	6.98	9330 D	536 D	1250	321 D	14	486	6250 D	80	0.29	42 D	<0.50	0.1	<0.001	<0.01	<0.005	0.02	<0.05	3	<0.1	0.07	<0.001	<0.1	0.0136	0.71	1.9	2.61	0.08 U	1.8 U	0.3 U
SBL-01	N	7/13/2010	6,845.81	6.50	7.06	9250 D	521 D	1170	311 D	13	490	5910 D	79 D	0.26	40 D	<0.50	<0.1	<0.001	<0.01	<0.005	0.03	<0.05	3.72	<0.1	0.08	0.001	<0.1	0.0152	0.15 U	1.7	1.85	0.07 U	0.3 U	0.4 U
SBL-01	N	10/5/2010	6,845.86	6.50	7.53	9080 D	486 D	1110	300 D	14	467	5890 D	85 D	0.15	42 D	<0.50	0.1	<0.001	<0.01	<0.005	0.02	<0.05	3.2	<0.1	0.07	<0.001	<0.1	0.0142	0.3	2.6	2.9	0.03 U	1.8	0.4 U
SBL-01	N	1/4/2011	6,845.81	6.27	7.35	7650 D	473 D	971	282 D	13	210	5050 D	86 D	0.24	56 D	<0.50	1.7	<0.001	<0.01	<0.005	0.06	<0.05	2.76	<0.1	0.19	<0.001	<0.1	0.0066	0.4	3.3	3.7	0.008 U	1.1 U	2.4
SBL-01	Dup	1/4/2011	no data	6.10	7.33	9040 D	511 D	1160	303 D	14	446	5960 D	82 D	0.23	40 D	<0.50	0.2	<0.001	<0.01	<0.005	0.02	<0.05	3.44	<0.1	0.07	<0.001	<0.1	0.0138	0.42	2.8	3.22	-0.002 U	0.2 U	0.8 U
SBL-01	N	4/4/2011	6,845.66	6.42	6.76	8310 D	471	1010	293 D	14	249	5440 D	79 D	0.07	63 D	<0.50	1.6	<0.001	<0.01	<0.005	0.06	<0.05	3.05	<0.1	0.18	<0.001	<0.1	0.0071	0.45	3	3.45	-0.02 U	0.7 U	1
SBL-01	Dup	4/4/2011	no data	6.57	6.99	9240 D	501	1180	314 D	15	438	6050 D	77 D	0.18	45 D	<0.50	0.1	<0.001	<0.01	<0.005	0.02	<0.05	3.34	<0.1	0.08	<0.001	<0.1	0.0128	0.15 U	2.1	2.25	-0.03 U	-0.09 U	1.2
SBL-01	N	7/12/2011	6,845.61	6.38	7.67	8960 D	515	1170	308 D	14	451	5910 D	79 D	<0.1	47 D	<0.50	0.6	<0.001	<0.01	<0.005	0.03	<0.05	3.55	<0.1	0.08	0.003	<0.1	0.0138	0.16 U	3.1	3.26	0.009 U	0.2 U	2
SBL-01	N	10/4/2011	6,845.74	6.62	7.49	8720 D	510	1140	301 D	14	415	5690 D	77 D	0.2 D	41 D	<0.50	0.1	<0.001	<0.01	<0.005	0.02	<0.05	3.57	<0.1	0.09	<0.001	<0.1	0.0119	0.28	2.1	2.38	0.0007 U	0.6 U	0.5
SBL-01	N	1/3/2012	6,845.61	6.52	6.97 H	9090 D	526	1170	300	15	419	5820 D	83 D	<0.1	41 D	<0.50	0.3	<0.001	<0.01	<0.005	0.02	<0.05	3.44	<0.1	0.08	<0.001	<0.1	0.0135	0.46	1.2 U	2.86	0.03 U	-0.09 U	0.6
SBL-01	N	4/3/2012	6,845.61	6.71	6.76 H	9420 D	534	1130	287	15	438	5810 D	78 D	<0.05	42 D	<0.50	<0.1	<0.01	<0.01	<0.005	0.02	<0.05	3.57	<0.1	0.07	<0.001	<0.1	0.0129	0.39	0.45 U	1.29	0.0006 U	0.0 U	0.4 U
SBL-01	N	7/10/2012	6,845.49	6.41	6.91 H	9270	474	1170	261	11	446	5680 D	79 D	0.44	44 D	<0.50	0.2	<0.001	<0.001	<0.005	0.02	<0.001	3.64	<0.1	0.07	<0.001	<0.1	0.0126	0.58	1.6	3.78	0.06 U	0.1 U	0.7
SBL-01	N	10/9/2012	6,845.61	6.72	6.83 H	8640	520	1150	297 D	15	460	5900 D	89 D	0.2 D	39 D	<0.50	0.2	<0.001	<0.001	<0.005	0.02	<0.001	3.74	<0.1	0.08	<0.001	<0.1	0.012	0.39	2.1 U	0.39	0.01 U	-0.4 U	1.2
SBL-01	N	1/9/2013	6,845.53	6.65	6.80 H	9200	501	1250	309 D	14	464	6030 D	78 D	0.08	40 D	<0.50	0.1	<0.001	<0.001	<0.005	0.03	<0.001	3.88	<0.1	0.08	<0.001	<0.1	0.0125	0.5	1.3 U	0.5	0.06 U	0.2 U	0.8
SBL-01	N	4/2/2013	6,845.57	6.61	6.87 H	9080	506	1240	303 D	14	462	5940 D	79 D	<0.05	40 D	<0.50	0.4	<0.001	<0.001	<0.005	0.02	<0.001	3.89	<0.1	0.08	<0.001	<0.1	0.0128	0.38	2.4	2.78	-0.01 U	-0.3 U	1.1
SBL-01	N	7/9/2013	6,845.34	6.56	6.85 H	9600	492	1190	290 D	13	464	5890 D	73 D	0.06	39 D	<0.50	0.2	<0.001	<0.001	<0.005	0.02	<0.001	3.48	<0.1	0.07	<0.001	<0.1	0.013	0.33	1.2 U	0.33	0.02 U	0.2 U	0.5 U
SBL-01	N	10/1/2013	6,845.48	6.61	6.75 H	9410	485	1200	290 D	13	462	5940 D	75 D	<0.05	43 D	<0.50	0.1	<0.001	<0.001	<0.005	0.03	<0.001	3.96	<0.1	0.08	<0.001	<0.1	0.0132	0.7	2.9	3.6	-0.01 U	0.6 U	0.4 U
SBL-01	N	1/7/2014	6,845.46	6.84	6.76	9150	478	1180	287	14	451	5890	77	0.35	40	<0.50	0.1	<0.001	<0.001	<0.005	0.03	<0.001	3.92	<0.1	0.08	<0.001	<0.1	0.012	0.64	3.6	4.24	-0.02 U	0.09 U	1
SBL-01	N	4/1/2014	6,845.47	6.80	6.77 H	8840	490	1220	291 D	13	424	5640 D	79 D	<0.05	43 D	<0.50	0.5	<0.001	<0.001	<0.005	0.03	<0.001	3.69	<0.1	0.08	<0.001	<0.1	0.0129	0.64	2.7	3.34	-0.004 U	0.09 U	0.7
SBL-01	N	7/8/2014	6,845.34	6.67	6.83 H	9270	502	1280	309 D	15	467	5900 D	73 D	<0.05	36 D	<0.50	0.3 D	<0.001	<0.001	<0.005	0.02	<0.001	3.68	<0.1	0.08	<0.001	<0.1	0.0104	0.41	0.97 U	0.41	0.04 U	0.1 U	0.4 U
SBL-01	N	10/7/2014	6,845.32	6.71	6.75 H	9040	473	1130	271	13	447	5890 D	75 D	<0.05	36 D	<0.50	0.6 D	<0.001	<0.001	<0.005	0.03	<0.001	3.38	<0.1	0.09	<0.001	<0.1	0.011	0.44	3.7	4.14	0.05 U	0.4 U	0.8
SBL-01	N	1/6/2015	6,845.33	6.73	6.71 H	9150	483	1170	278	13	437	6180 D	94 D	<0.05	38 D	<0.50	0.3	<0.001	<0.001	<0.005	0.03 D	<0.001	3.52	<0.1	0.1	<0.001	<0.1	0.0112	0.34	1.5	1.84	0.02 U	0.3 U	2.2
SBL-01	N	4/7/2015	6,845.32	6.68	6.85 H	9380	483	1190	285 D	14	452	6010 D	111 D	<0.05	39 D	<0.5	0.3 D	0.001	<0.001	<0.005	0.03	<0.001	3.41	<0.1	0.12	<0.001	<0.1	0.0093	0.71	2	2.71	0.2 U	-0.3 U	3.1
SBL-01	N	7/7/2015	6,845.22	6.52	6.80 H	9080	481	1150	283	16	469	6070 D	84 D	<0.05	35 D	<0.50	0.5	<0.001	<0.001	<0.005	0.03	<0.001	3.8	<0.1	0.09	<0.001	<0.1	0.0114	0.52	2.2	2.72	2.8	1 U	2
SBL-01	N	10/6/2015	6,845.22	6.71	6.71 H	9100	465	1160	278 D	14	438	6050 D	96 D	0.06	33 D	<0.50	0.2	<0.001	<0.001	<0.005	0.03	<0.001	3.71	<0.1	0.08	<0.001	<0.1	0.0119	0.28	2.2	2.48	0.3 U	0.08 U	3.2

TABLE A.1

Southwest Alluvium Data Summary, 1989-2019

United Nuclear Corporation, Church Rock Site, Church Rock, New Mexico

Location ID	Desc	Sample Date	Water Elevation	Field pH	Lab pH	Lab TDS	Ca	Mg	Na	K	HCO3	SO4	Chl	NH4 as N	NO3 as N	TTHMs (Chloroform)	Al	As	Be	Cd	Co	Pb	Mn	Mo	Ni	Se	V	U	Rad-226	Rad-228	Rad Total	Th-230	Pb-210	Gross Alpha
			ft amsl	SU	SU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pci/l	pci/l	pci/l	pci/l	pci/l	pci/l
		NRC Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	NA	0.05	0.05	0.025	NA	0.07	NA	NA	0.078	0.07	0.1	0.3	NA	NA	8.2	4.5	5.9	15
		EPA Standard	NA	NA	NA	10376	NA	NA	NA	NA	NA	5815	250	NA	536.6	80	5	0.01	0.004	0.025	0.05	0.07	2.1	1	0.2	0.07	0.1	NA	NA	NA	8.2	4.5	5.9	15
SBL-01	N	1/5/2016	6,845.30	6.74	6.73 H	9350	484	1250	285	14	473	6130 D	80 D	<0.05	38 D	<0.50	0.6	<0.001	<0.001	<0.005	0.02	<0.001	3.66	<0.1	0.07	<0.001	<0.1	0.0097	0.38	1.5	0.2 U	0.1 U	2.2	0
SBL-01	N	4/5/2016	6,845.11	6.69	6.84 H	9300	498	1250	282 D	13	442	6180 D	77 D	<0.05	35 D	<0.50	0.3	<0.001	<0.001	<0.005	0.02	<0.001	3.76	<0.1	0.07	<0.001	<0.1	0.0112	0.5	1.9	2.4	0.03 U	0.3 U	1.4
SBL-01	N	7/12/2016	6,845.14	6.69	6.76 H	9380	486	1230	287	13	460	5840 DH	86 D	<0.05	38 D	<0.50	0.2	0.001	<0.001	<0.005	0.03	<0.001	3.44	<0.1	0.07	<0.001	<0.1	0.0098	0.43	1.9 U	0.43	0.03 U	-0.04 U	0.8 U
SBL-01	N	10/4/2016	6,845.24	6.87	6.77 H	9070	490	1240	293	14	440	6150 D	78 D	<0.05	38 D	<0.50	0.7	<0.001	<0.001	<0.005	0.03	0.001	3.97	<0.1	0.09	<0.001	<0.1	0.0097	0.41	1.8	2.21	-0.01 U	0.3 U	4.6
SBL-01	N	1/10/2017	6,845.19	6.71	6.81 H	9170 D	500	1220	281	14	461	6170 D	82 D	<0.05	39 D	<0.50	0.3	<0.001	<0.001	<0.005	0.03	<0.001	3.81	<0.1	0.09	<0.001	<0.1	0.0091	0.44	1.3 U	0.44	0.05 U	-0.5 U	2.5
SBL-01	N	4/4/2017	6,845.13	6.59	6.79 H	9200 D	474	1220	286 D	14	461	6460 D	85 D	<0.05	38 D	<0.50	0.3	<0.001	<0.001	<0.005	0.03	<0.001	3.96	<0.1	0.09	<0.001	<0.1	0.0093	0.69	1.4 U	0.69	0.04 U	0.3 U	3.2
SBL-01	N	7/11/2017	6,845.00	6.50	6.81 H	8860 D	483	1190	284 D	14	461	5690 D	76 D	<0.05	36.8 D	<0.50	0.5	0.001	<0.001	<0.005	0.03	<0.001	4.13	<0.1	0.1	<0.001	<0.1	0.0101	0.5	2.3	2.8	0.001 U	0.3 U	0.7
SBL-01	N	10/3/2017	6,845.04	6.61	6.80 H	8870 D	477	1220	280 D	13	452	5520 D	73 D	<0.05	35.3 D	<0.50	0.4	<0.001	<0.001	<0.005	0.03	<0.001	4.02	<0.1	0.12	<0.001	<0.1	0.0102	0.4	2.6	3	0.04 U	-0.2 U	1.1
SBL-01	N	1/9/2018	6,844.98	6.62	6.80 H	9430 D	473	1210	272 D	13	425	6190 D	75 D	<0.05	35.0 D	<0.50	0.55 D	<0.001	<0.001	<0.001	0.032	<0.001	4.40 D	0.001	0.092	<0.001	<0.01	0.0099	0.6	3.4	4	0.04 U	0.8 U	0.8
SBL-01	N	4/3/2018	6,845.03	6.63	6.93 H	9310 D	466	1170	280 D	13	438	6280 D	79 D	<0.05	38 D	<0.50	0.19	<0.001	<0.001	<0.001	0.027	0.002	4.08	0.009	0.086	<0.001	<0.01	0.0102	0.5	2.1	2.6	0.3	0.1 U	1.4
SBL-01	N	7/10/2018	6,844.87	6.57	6.78 H	9310 D	478	1160	263	13	452	5720 D	74 D	<0.05	37.9 D	<0.50	0.18	<0.001	<0.001	<0.001	0.024	<0.001	3.63	0.001	0.083	<0.001	<0.01	0.0093	0.4	2	2.4	0.04 U	-0.1 U	0.9
SBL-01	N	10/2/2018	6,844.96	6.49	6.80 H	9350 D	478	1250	299 D	13	437	6150 D	78 D	<0.05	36.6 D	<0.50	0.52	<0.001	<0.001	<0.001	0.029	<0.001	3.78	0.001	0.081	<0.001	<0.01	0.0089	0.5	2.7	3.2	0.05 U	0.5 U	1.1
SBL-01	N	1/8/2019	6,844.83	6.56	6.82 H	9310 D	506	1330	311	15	449	6190 D	78 D	<0.05	33.1 D	<0.50	0.69	no data	<0.001	<0.001	0.025	<0.001	3.83	0.002	0.084	no data	<0.01	0.0083	0.5	1.3	1.5	-0.02 U	0.3 U	1.1
SBL-01	N	4/9/2019	6,844.86	6.45	6.9 H	9610 D	480	1270	291	13	456	5990 D	74 D	<0.05	33.4 D	<0.50	0.59	0.002	0.001	<0.001	0.026	<0.001	3.89	0.001	0.08 D	0.013	<0.01	0.0085	0.4	1.6 U	2	-0.04 U	0.6 U	1
SBL-01	N	7/30/2019	6,844.74	6.58	6.75 H	9440 DH	480	1260	282	15	396	6190 D	77 D	<0.05	39.4 D	<0.50	0.47 D	<0.001	<0.001	<0.001	0.036	<0.001	3.75 D	<0.001	0.13	0.019	<0.01	0.0069 D	0.7	3	3.7	0.07	-0.2 U	1.4
SBL-01	N	10/9/2019	6,844.76	6.74	6.79 H	9200 DH	483	1260	286	14	415	6210 D	76 D	<0.05	35.8 D	<0.50	0.22	<0.001	<0.001	<0.001	0.031	<0.001	3.52 D	<0.001	0.126	0.016 D	<0.01	0.005 D	0.4	1 U	1.4	-0.007 U	-0.03 U	1