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Annual Groundwater Monitoring Report Calendar Year 2024

Prepared by
Sandia National Laboratories, Albuquerque, NM

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Abstract

SNL/NM is a multimission laboratory managed and operated by National Technology & Engineering Solutions of Sandia, LLC, a wholly owned subsidiary of Honeywell International Inc., under contract with the DOE/NNSA. The DOE/NNSA Sandia Field Office administers the contract and oversees contractor operations at SNL/NM.

This Report summarizes the calendar year 2024 groundwater monitoring results for SNL/NM, which were compiled from groundwater data collected from Groundwater Monitoring Program locations, the Chemical Waste Landfill, the Mixed Waste Landfill, and the Technical Area-V Groundwater, Tijeras Arroyo Groundwater, and Burn Site Groundwater Areas of Concern.

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Executive Summary

This document presents the Sandia National Laboratories, New Mexico (SNL/NM) *Annual Groundwater Monitoring Report, Calendar Year 2024* (Report). Located on Kirtland Air Force Base (KAFB) in central New Mexico, SNL/NM is a multimission laboratory managed and operated by National Technology & Engineering Solutions of Sandia, LLC, a wholly owned subsidiary of Honeywell International Inc., under contract with the U.S. Department of Energy National Nuclear Security Administration (DOE/NNSA).

Groundwater monitoring at SNL/NM is subject to the following four sets of regulatory requirements:

- *Resource Conservation and Recovery Act Facility Operating Permit for Sandia National Laboratories, EPA ID No. NM5890110518* (RCRA Permit) (NMED, January 2015, as modified)
- *Compliance Order on Consent Pursuant to the New Mexico Hazardous Waste Act 74-4-10: Sandia National Laboratories Consent Order* (Consent Order) (NMED, April 2004)
- *Hazardous Waste Permit, EPA ID No. NM5890110518, to the U.S. Department of Energy and Sandia Corporation, for Sandia National Laboratories, Located in Bernalillo County New Mexico* (Chemical Waste Landfill Post-Closure Care Permit [CWL PCCP]) (NMED, October 2009, as modified)
- Comprehensive site-wide groundwater monitoring plan submitted to the New Mexico Environment Department (NMED) annually.

DOE/NNSA and SNL/NM personnel have prepared this Report to meet the applicable reporting requirements, provide regulators and other stakeholders with updated groundwater data for SNL/NM, and inform the public about the groundwater quality at SNL/NM.

This Report summarizes the calendar year (CY) 2024 groundwater monitoring results for SNL/NM. It includes analytical results and other pertinent groundwater information. This information supports the *Sandia National Laboratories, New Mexico 2024 Annual Site Environmental Report* (SNL/NM, August 2024) in meeting the requirements of DOE Order 231.1B, Admin Chg 1, *Environment, Safety, and Health Reporting* (DOE, November 2012).

Chapter 1.0 provides a general site description of SNL/NM, including its geologic and hydrogeologic settings. SNL/NM is located near the east-central edge of the Albuquerque Basin. The Albuquerque Basin (also known as the Middle Rio Grande Basin) is one of a series of north-south trending basins that was formed during the extension of the Rio Grande Rift. The Albuquerque Basin contains the Regional Aquifer, which supplies groundwater to Albuquerque Bernalillo County Water Utility Authority, Veterans Affairs, and KAFB production wells. Part of the Regional Aquifer underlies SNL/NM and its operations, hence the importance of monitoring the groundwater at SNL/NM.

Chapter 1.0 also describes the regulatory requirements and field and analytical procedures and methods for both the site-wide and site-specific groundwater monitoring activities at SNL/NM.

The remaining chapters focus on the groundwater monitoring activities performed at the following six monitoring well networks maintained at SNL/NM: Groundwater Monitoring Program (GMP) (Chapter 2.0), Chemical Waste Landfill (CWL) (Chapter 3.0), Mixed Waste Landfill (MWL) (Chapter 4.0), Technical Area-V Groundwater (TAVG) Area of Concern (AOC) (Chapter 5.0), Tijeras Arroyo Groundwater (TAG) AOC (Chapter 6.0), and Burn Site Groundwater (BSG) AOC (Chapter 7.0).

Most of the sites associated with the six monitoring well networks are categorized as Solid Waste Management Units (SWMUs) or AOCs. A SWMU is any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for solid or hazardous waste management. An AOC is any area that may have had a hazardous waste or hazardous constituent release but is not a SWMU. Monitoring and/or corrective action requirements are generally determined on a SWMU-specific or AOC-specific basis following a site investigation.

The GMP manages the comprehensive groundwater elevation monitoring at SNL/NM, as well as site-wide monitoring well information. The GMP monitoring well network includes the test wells, monitoring wells, and springs identified in the Consent Order as adequate for establishing background groundwater quality and understanding the general hydrogeologic system at SNL/NM. The Consent Order and the comprehensive site-wide groundwater monitoring plan define the groundwater monitoring requirements and plan for the GMP, respectively.

The CWL is a 1.9-acre remediated hazardous waste landfill undergoing post-closure care in accordance with the CWL PCCP, which took effect on June 2, 2011 (NMED, June 2011). The CWL PCCP defines the groundwater monitoring requirements for the CWL.

The MWL is a 2.6-acre SWMU that underwent corrective action in accordance with the Consent Order and was granted Corrective Action Complete with Controls status on March 13, 2016 (NMED, February 2016a). The *Long-Term Monitoring and Maintenance Plan for the Mixed Waste Landfill* (MWL LTMMP) (SNL/NM, March 2012, as modified), which took effect on January 8, 2014 (NMED January 2014) and is incorporated into the RCRA Permit (NMED, February 2016b), defines the groundwater monitoring requirements for the MWL.

The TAVG, TAG, and BSG AOCs are undergoing corrective action in accordance with the Consent Order. The Consent Order and the comprehensive site-wide groundwater monitoring plan define the groundwater monitoring requirements and plan for all three AOCs, respectively.

Groundwater Monitoring Activities and Results

In CY 2024, groundwater samples were collected from monitoring wells in all six monitoring well networks. The analytical results are compared to the U.S. Environmental Protection Agency maximum contaminant levels (EPA MCLs) (EPA, March 2018) and the New Mexico Water Quality Control Commission maximum allowable concentrations (MACs) (NMWQCC, December 2018), where established. The EPA MCLs and MACs are the federal and state regulatory standards for drinking water and groundwater, respectively.

Groundwater Monitoring Program

Chapter 2.0 summarizes the CY 2024 GMP groundwater monitoring activities and results. The activities were performed and documented in accordance with the Consent Order and the *Comprehensive Site-Wide Groundwater Monitoring Plan (Revised), Calendar Year 2024* (CY 2024 Comprehensive Site-Wide Plan) (SNL/NM, April 2023).

Groundwater samples were collected from 16 GMP monitoring wells (CCBA-MW2, CTF-MW1, CYN-MW5, Greystone-MW2, MRN-2, MRN-3D, NWTA3-MW3D, OBS-MW1, PL-2, PL-4, SFR-2S, SFR-4T, SWTA3-MW2, SWTA3-MW3, SWTA3-MW4, and TRE-1) and a surface water sample was collected from Coyote Springs in April/May 2024. The samples were analyzed for volatile organic compounds (VOCs), high explosive (HE) compounds (select monitoring wells only), nitrate plus nitrite (NPN), alkalinity, major anions (chloride, bromide, fluoride, and sulfate), total organic halogens, total phenol, total cyanide, mercury, Target Analyte List (TAL) metals (all monitoring wells) plus total uranium (select monitoring wells only), gamma spectroscopy short list (americium-241, cesium-137,

cobalt-60, and potassium-40), gross alpha/beta activity, isotopic uranium (uranium 233/234, uranium-235/236, and uranium-238), radium-226, and radium-228. Except for beryllium and fluoride, no analytes were detected at concentrations exceeding the EPA MCLs or MACs. Beryllium exceeded the EPA MCL and MAC of 0.004 mg/L in the Coyote Springs surface water sample at a concentration of 0.00718 mg/L. Fluoride exceeded the MAC of 1.6 mg/L at three monitoring wells (OBS-MW1, SFR-2S, and SWTA3-MW4), with concentrations ranging from 1.62 mg/L to 2.08 mg/L. These results are consistent with historical results, and the beryllium and fluoride are considered to be naturally occurring.

The water levels at 105 SNL/NM (DOE/NNSA-owned) monitoring wells were measured quarterly and used to determine groundwater elevations. The groundwater elevation data for the 105 SNL/NM monitoring wells, as well as 83 additional monitoring wells owned by other agencies (Table 2), were used to construct the site-wide potentiometric surface map of the Regional Aquifer and fractured bedrock aquifer system (Plate 1). Overall, the contours display a pattern that reflects the impact of groundwater withdrawal by production wells located in the northwestern part of KAFB and adjacent parts of Albuquerque.

Chemical Waste Landfill

Chapter 3.0 summarizes the CY 2024 CWL groundwater monitoring activities and results. The activities were performed and documented in accordance with the CWL PCCP.

The CWL is a 1.9-acre remediated hazardous waste landfill located in the southeast corner of Technical Area (TA)-III. It was used to dispose of chemical, radioactive, and solid wastes generated by SNL/NM research activities from 1962 to 1985. It underwent two voluntary corrective measures (vapor extraction and landfill excavation) from 1996 through 2002 to reduce the contamination sources and mitigate groundwater impacts, followed by installation of an at-grade evapotranspirative cover, which was completed in September 2005. It has been undergoing post-closure care in accordance with the CWL PCCP since June 2, 2011, the date the NMED approved its closure.

The water levels at four CWL monitoring wells (CWL-BW5, CWL-MW9, CWL-MW10, and CWL-MW11) were measured quarterly, and groundwater samples were collected from the same four monitoring wells in January and July 2024. The January 2024 samples were analyzed for trichloroethene (TCE), chromium, nickel, and the enhanced list of VOCs (1,1-dichloroethene; 1,1,2-trichloro-1,2,2-trifluoroethane; chloroform; tetrachloroethene; and trichlorofluoromethane). The July 2024 samples were analyzed for TCE, chromium, and nickel. No analytes were detected at concentrations exceeding the EPA MCLs or CWL PCCP hazardous constituent concentration limits, and the results are consistent with historical results.

In accordance with the CWL PCCP, CWL groundwater monitoring will continue on a semiannual basis. To eliminate dual reporting not required by the CWL PCCP or the Consent Order, CWL groundwater monitoring results will not be included in future annual groundwater monitoring reports. All CWL monitoring, inspection, and maintenance activities will continue to be performed in accordance with the CWL PCCP and documented in the CWL annual post-closure care reports submitted to the NMED in March of each year.

Mixed Waste Landfill

Chapter 4.0 summarizes the CY 2024 MWL groundwater monitoring activities and results. The activities were performed and documented in accordance with the MWL LTMMP.

The MWL is a 2.6-acre SWMU that is located in the north-central part of TA-III and was operational from 1959 through 1988. It consists of a classified area and an unclassified area that received low-level radioactive, hazardous, and mixed wastes. It underwent corrective action, including installation of an

evapotranspirative vegetative soil cover with a biointrusion barrier in 2009, and was granted Corrective Action Complete with Controls status in 2016. It has been monitored in accordance with the MWL LTMMP since January 8, 2014, the date the NMED approved the plan (NMED, January 2014).

The water levels at seven MWL monitoring wells (MWL-BW2, MWL-MW4, MWL-MW5, MWL-MW6, MWL-MW7, MWL-MW8, and MWL-MW9) were measured quarterly, and groundwater samples were collected from four MWL monitoring wells (MWL-BW2, MWL-MW7, MWL-MW8, and MWL-MW9, the compliance monitoring wells) in May and October 2024. The samples were analyzed for VOCs, metals (cadmium, chromium, nickel, and total uranium), specific radionuclides by gamma spectroscopy, gross alpha/beta activity, radon-222, and tritium. No analytes were detected at concentrations exceeding the EPA MCLs or MWL LTMMP trigger levels, and the results are consistent with historical results.

In accordance with the MWL LTTMP, MWL groundwater monitoring will continue on a semiannual basis. To eliminate dual reporting not required by the RCRA Permit (MWL LTMMP) or the Consent Order, MWL groundwater monitoring results will not be included in future annual groundwater monitoring reports. All MWL monitoring, inspection, and maintenance activities will continue to be performed in accordance with the MWL LTMMP and documented in the MWL annual long-term monitoring and maintenance reports submitted to the NMED in June of each year.

Technical Area-V Groundwater Area of Concern

Chapter 5.0 summarizes the CY 2024 TAVG AOC groundwater monitoring activities and results. The activities were performed and documented in accordance with the Consent Order and the CY 2024 Comprehensive Site-Wide Plan.

The TAVG AOC is located in the northeast corner of TA-III. Three wastewater and sanitary waste disposal facilities were used in the vicinity of this AOC from the 1960s to the early 1990s. Both TCE and nitrate have been identified as constituents of concern in the groundwater in this AOC based on detections above the EPA MCLs.

The water levels at 17 TAVG AOC monitoring wells (LWDS-MW1 and TAV-MW2 through TAV-MW17) were measured quarterly, and groundwater samples were collected from the same 17 monitoring wells in January/February and July/August 2024. The samples were analyzed for VOCs, NPN, perchlorate (TAV-MW17 only), major anions, alkalinity, TAL metals plus total uranium, gamma spectroscopy short list, gross alpha/beta activity, and tritium. Except for TCE and NPN, no analytes were detected at concentrations exceeding the EPA MCLs. TCE exceeded the EPA MCL of 5 µg/L in the environmental samples collected from five monitoring wells (LWDS-MW1, TAV-MW4, TAV-MW6, TAV-MW8, and TAV-MW10), with a maximum concentration of 9.11 µg/L in the February 2024 TAV-MW10 environmental sample. NPN exceeded the EPA MCL of 10 mg/L in the environmental samples collected from two monitoring wells (LWDS-MW1 and TAV-MW10), with a maximum concentration of 12.9 mg/L in the February 2024 TAV-MW10 environmental sample. The TCE and NPN concentrations in the environmental samples collected from the other monitoring wells were below the EPA MCLs. These results are consistent with historical results.

Tijeras Arroyo Groundwater Area of Concern

Chapter 6.0 summarizes the CY 2024 TAG AOC groundwater monitoring activities and results. The activities were performed and documented in accordance with the Consent Order and the CY 2024 Comprehensive Site-Wide Monitoring Plan.

The TAG AOC is located in the north-central part of KAFB. It covers approximately 1.82 mi^2 and spans three TAs (I, II, and IV) in which a wide variety of research and development activities, including weapons development, have been conducted. It overlies two water-bearing zones: the Perched

Groundwater System (PGWS) and the Regional Aquifer. The groundwater in the PGWS has been impacted by wastewater and septic water discharges that occurred from the late 1940s to 1992, with nitrate identified as the constituent of concern based on detections above the EPA MCL. The selected final remedy for the elevated nitrate concentrations is monitored natural attenuation (NMED, January 2023). The NMED-approved *Tijeras Arroyo Groundwater Corrective Measures Implementation Plan (Revised)* (SNL/NM, June 2023; NMED, March 2024) describes the remedy implementation plan and cleanup goals, which are for the nitrate concentrations to decrease below the EPA MCL and/or for the PGWS to naturally dewater.

The water levels at 25 TAG AOC monitoring wells were measured quarterly, and groundwater samples were collected from 19 TAG AOC monitoring wells, specifically 11 PGWS monitoring wells (TA1-W-06, TA1-W-08, TA2-NW1-325, TA2-W-01, TA2-W-19, TA2-W-26, TA2-W-27, TA2-W-28, TJA-2, TJA-5, and TJA-7) in February/March and August/September 2024 and 8 Regional Aquifer monitoring wells (TA1-W-02, TA2-NW1-595, TA2-W-24, TA2-W-25, TJA-3, TJA-4, TJA-6, and WYO-3) in August/September 2024. The samples were analyzed for NPN. NPN exceeded the EPA MCL of 10 mg/L in the environmental samples collected from five PGWS monitoring wells (TA2-W-19, TA2-W-28, TJA-2, TJA-5, and TJA-7), with a maximum concentration of 21.9 mg/L in the September 2024 TJA-7 environmental sample, and one Regional Aquifer monitoring well (TJA-4, the Merging Zone monitoring well), with a concentration of 32.5 mg/L in the September 2024 environmental duplicate sample. The NPN concentrations in the environmental samples collected from the other monitoring wells were below the EPA MCL. These results are consistent with historical results.

Burn Site Groundwater Area of Concern

Chapter 7.0 summarizes the CY 2024 BSG AOC groundwater monitoring activities and results. The activities were performed and documented in accordance with the Consent Order and the CY 2024 comprehensive site-wide groundwater monitoring plan.

The BSG AOC is located in Lurance Canyon, a remote area in the eastern part of KAFB. It was used from the 1960s through the 1980s for explosives tests and burn tests. Groundwater investigations were initiated in 1997 at the NMED's request after elevated nitrate concentrations were discovered at the Burn Site Well (a non-potable production well inactive since 2003). The elevated nitrate concentrations are most likely associated with the prior use of ammonium-nitrate slurry at the Burn Site.

The water levels at 16 BSG AOC monitoring wells and the Burn Site Well were measured quarterly, and groundwater samples were collected from 13 BSG AOC monitoring wells (CYN-MW4, CYN-MW7, CYN-MW8, CYN-MW9, CYN-MW10, CYN-MW11, CYN-MW12, CYN-MW13, CYN-MW14A, CYN-MW16, CYN-MW17, CYN-MW18, and CYN-MW19) in May/June and October/November 2024. Due to declining water levels, BSG AOC monitoring well CYN-MW15 could not be sampled during either sampling event. The samples were analyzed for NPN, diesel range organics, gasoline range organics, VOCs, HE compounds, major anions, total alkalinity, TAL metals, gamma spectroscopy short list, gross alpha/beta activity, isotopic uranium, and tritium. Except for NPN, no analytes were detected at concentrations exceeding the EPA MCLs. NPN exceeded the EPA MCL of 10 mg/L in the environmental samples collected from five monitoring wells (CYN-MW9, CYN-MW10, CYN-MW12, CYN-MW13, and CYN-MW14A), with a maximum concentration of 34.0 mg/L in the October 2024 CYN-MW9 environmental sample. The NPN concentrations at these monitoring wells have been variable within a narrow range over the past year.

Future Groundwater Monitoring Events

Site-wide and site-specific monitoring of the groundwater at SNL/NM will continue in CY 2025 in accordance with the applicable regulatory requirements. The monitoring activities and results will be reported in the CY 2025 annual groundwater monitoring report.

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Table of Contents

Executive Summary vii
Table of Contents xv
Chapter References xix
Chapter Figures xx
Chapter Tables xxii
Attachments xxiv
Tables xxv
Plate xxv
Data Packages xxv
Acronyms and Abbreviations xxvi
Units xxviii
Well Location Descriptions xxix
Meteorological Towers xxx
1.0 INTRODUCTION 1-1
1.1 Site Description 1-1
1.1.1 Climate 1-1
1.1.2 Geologic Setting 1-1
1.1.3 Hydrogeology 1-6
1.1.4 Surface Water Hydrology 1-6
1.2 Groundwater Monitoring 1-7
1.2.1 Groundwater Monitoring Agencies 1-7
1.2.2 Regulatory Requirements 1-14
1.3 Field and Analytical Procedures and Methods 1-15
1.3.1 Field Procedures and Measurements 1-15
1.3.2 Analytical Methods 1-17
1.3.3 Quality Control Samples 1-18
1.3.4 Field Quality Control Samples 1-18
1.3.5 Laboratory Quality Control Samples 1-20
Chapter 1.0 Introduction References R-1
2.0 GROUNDWATER MONITORING PROGRAM 2-1
2.1 Introduction 2-1
2.2 Regulatory Requirements 2-3
2.3 Scope of Activities 2-3
2.3.1 Groundwater Monitoring 2-3
2.3.2 Monitoring Well Installation 2-4
2.4 Field Procedures and Measurements 2-4
2.5 Analytical Methods 2-4
2.6 Summary of Calendar Year 2024 Groundwater Monitoring Results 2-4
2.6.1 Analytical Results 2-5
2.6.2 Water Level Measurements 2-6

Table of Contents (continued)

2.7 Quality Control Results 2-15
2.7.1 Field Quality Control Samples 2-15
2.7.2 Laboratory Quality Control Samples 2-16
2.8 Variances and Nonconformances 2-16
2.9 Summary and Conclusions 2-16
2.10 Summary of Future Activities 2-17
3.0 CHEMICAL WASTE LANDFILL 3-1
3.1 Introduction 3-1
3.1.1 Monitoring History 3-3
3.1.2 Monitoring Well Network 3-3
3.1.3 Conceptual Site Model 3-5
3.2 Regulatory Requirements 3-6
3.3 Scope of Activities 3-6
3.4 Field Procedures and Measurements 3-7
3.5 Analytical Methods 3-8
3.6 Summary of Calendar Year 2024 Groundwater Monitoring Results 3-8
3.6.1 Analytical Results 3-8
3.6.2 Field Water Quality Parameter Measurements 3-8
3.7 Quality Control Results 3-8
3.7.1 Field Quality Control Samples 3-8
3.7.2 Laboratory Quality Control Samples 3-9
3.8 Variances and Nonconformances 3-10
3.9 Summary and Conclusions 3-10
3.10 Summary of Future Activities 3-10
4.0 MIXED WASTE LANDFILL 4-1
4.1 Introduction 4-1
4.1.1 Monitoring History 4-3
4.1.2 Monitoring Well Network 4-3
4.1.3 Conceptual Site Model 4-4
4.2 Regulatory Requirements 4-6
4.3 Scope of Activities 4-7
4.4 Field Procedures and Measurements 4-7
4.5 Analytical Methods 4-8
4.6 Summary of Calendar Year 2024 Groundwater Monitoring Results 4-8
4.6.1 Analytical Results 4-8
4.6.2 Field Water Quality Parameter Measurements 4-9
4.7 Quality Control Results 4-9
4.7.1 Field Quality Control Samples 4-9
4.7.2 Laboratory Quality Control Samples 4-10
4.8 Variances and Nonconformances 4-10

Table of Contents (continued)

4.9 Summary and Conclusions 4-10
4.10 Summary of Future Activities 4-11
5.0 TECHNICAL AREA-V GROUNDWATER AREA OF CONCERN 5-1
5.1 Introduction 5-1
5.1.1 Location 5-1
5.1.2 Site History 5-1
5.1.3 Monitoring History 5-3
5.1.4 Current Monitoring Well Network 5-3
5.1.5 Conceptual Site Model 5-6
5.2 Regulatory Requirements 5-15
5.3 Scope of Activities 5-17
5.4 Field Procedures and Measurements 5-19
5.5 Analytical Methods 5-19
5.6 Summary of Calendar Year 2024 Groundwater Monitoring Results 5-19
5.6.1 Analytical Results for Environmental Samples 5-19
5.6.2 Analytical Results for Waste Characterization Samples 5-24
5.6.3 Field Water Quality Parameter Measurements 5-24
5.7 Quality Control Results 5-25
5.8 Variances and Nonconformances 5-27
5.9 Summary and Conclusions 5-27
5.10 Summary of Future Activities 5-28
6.0 TIJERAS ARROYO GROUNDWATER AREA OF CONCERN 6-1
6.1 Introduction 6-1
6.1.1 Location 6-2
6.1.2 Site History 6-2
6.1.3 Monitoring History 6-2
6.1.4 Current Monitoring Well Network 6-4
6.1.5 Conceptual Site Model 6-7
6.2 Regulatory Requirements 6-23
6.3 Scope of Activities 6-24
6.4 Field Procedures and Measurements 6-26
6.5 Analytical Methods 6-26
6.6 Summary of Calendar Year 2024 Groundwater Monitoring Results 6-27
6.6.1 Analytical Results for Environmental Samples 6-27
6.6.2 Analytical Results for Waste Characterization Samples 6-33
6.6.3 Field Water Quality Parameter Measurements 6-33
6.7 Quality Control Results 6-33
6.8 Variances and Nonconformances 6-35
6.9 Summary and Conclusions 6-35
6.10 Summary of Future Activities 6-37

Table of Contents (concluded)

7.0 BURN SITE GROUNDWATER AREA OF CONCERN 7-1
7.1 Introduction 7-1
7.1.1 Location 7-1
7.1.2 Site History 7-1
7.1.3 Monitoring History 7-4
7.1.4 Current Monitoring Well Network 7-8
7.1.5 Conceptual Site Model 7-8
7.2 Regulatory Requirements 7-15
7.3 Scope of Activities 7-15
7.4 Field Procedures and Measurements 7-16
7.5 Analytical Methods 7-17
7.6 Summary of Calendar Year 2024 Groundwater Monitoring Results 7-17
7.6.1 Analytical Results for Environmental Samples 7-17
7.6.2 Analytical Results for Waste Characterization Samples 7-19
7.6.3 Field Water Quality Parameter Measurements 7-20
7.7 Quality Control Results 7-20
7.8 Variances and Nonconformances 7-21
7.9 Summary and Conclusions 7-21
7.10 Summary of Future Activities 7-22

Chapter References

Chapter 1.0 Introduction References R1-1
Chapter 2.0 Groundwater Monitoring Program References R2-1
Chapter 3.0 Chemical Waste Landfill References R3-1
Chapter 4.0 Mixed Waste Landfill References R4-1
Chapter 5.0 Technical Area-V Groundwater Area of Concern References R5-1
Chapter 6.0 Tijeras Arroyo Groundwater Area of Concern References R6-1
Chapter 7.0 Burn Site Groundwater Area of Concern References R7-1

Chapter Figures

Figure 1-1 Albuquerque Basin, North Central New Mexico 1-2

Figure 1-2 Generalized Geology in the Vicinity of Sandia National Laboratories, New Mexico and Kirtland Air Force Base (Van Hart, June 2003) 1-4

Figure 1-3 Hydrogeologically Distinct Areas Controlled by Faults (Modified from GRAM and Lettis, December 1995, and Van Hart, June 2003) 1-5

Figure 1-4 Wells and Springs within Sandia National Laboratories, New Mexico and Kirtland Air Force Base 1-8

Figure 2-1 Groundwater Monitoring Program Monitoring Well Network 2-2

Figure 2-2 Geographic Distribution of Hydrographs for Monitoring Wells in the Regional Aquifer and Fractured Bedrock Aquifer System at Sandia National Laboratories, New Mexico 2-13

Figure 3-1 Location of the Chemical Waste Landfill with Respect to Kirtland Air Force Base and the City of Albuquerque 3-2

Figure 3-2 Localized Potentiometric Surface of the Regional Aquifer at the Chemical Waste Landfill, October 2024 3-4

Figure 4-1 Location of the Mixed Waste Landfill with Respect to Kirtland Air Force Base and the City of Albuquerque 4-2

Figure 4-2 Localized Potentiometric Surface of the Regional Aquifer at the Mixed Waste Landfill, October 2024 4-5

Figure 5-1 Location of Sandia National Laboratories, New Mexico and Technical Area-V 5-2

Figure 5-2 Technical Area-V Groundwater Area of Concern Monitoring Well Locations 5-5

Figure 5-3 Conceptual Site Model for the Technical Area-V Groundwater Area of Concern (SNL/NM, September 2015) 5-7

Figure 5-4 Potentiometric Surface of the Regional Aquifer in the Technical Area-V Groundwater Area of Concern (October 2024) 5-11

Figure 5-5 Distribution of Trichloroethene in Groundwater in the Technical Area-V Groundwater Area of Concern, July/August 2024 5-22

Figure 5-6 Distribution of Nitrate Plus Nitrite in Groundwater in the Technical Area-V Groundwater Area of Concern, July/August 2024 5-23

Figure 6-1 Location of the Tijeras Arroyo Groundwater Area of Concern 6-3

Figure 6-2 Tijeras Arroyo Groundwater Area of Concern Monitoring Wells Accessed by Sandia National Laboratories, New Mexico Personnel 6-6

Figure 6-3 Conceptual Site Model for the Tijeras Arroyo Groundwater Area of Concern (SNL/NM, June 2021) 6-8

Figure 6-4 Potentiometric Surface Map of the Perched Groundwater System in the Tijeras Arroyo Groundwater Area of Concern, October 2024 6-13

Figure 6-5 Potentiometric Surface Map of the Regional Aquifer in the Tijeras Arroyo Groundwater Area of Concern, October 2024 6-14

Figure 6-6 Annual Decline Rates for Groundwater Elevations at Perched Groundwater System Monitoring Wells in the Tijeras Arroyo Groundwater Area of Concern 6-20

Figure 6-7 Hydrographs for Perched Groundwater System Monitoring Wells in the Tijeras Arroyo Groundwater Area of Concern 6-21

Figure 6-8 Lateral Extent of the Perched Groundwater System Screen in the Tijeras Arroyo Groundwater Area of Concern 6-22

Chapter Figures (concluded)

Figure 6-9 Nitrate Plus Nitrite Distribution in the Perched Groundwater System and Regional Aquifer in the Tijeras Arroyo Groundwater Area of Concern, August/September 2024 6-30

Figure 6-10 Nitrate Plus Nitrite Concentration Trend Plot for Perched Groundwater System Monitoring Wells in the Tijeras Arroyo Groundwater Area of Concern Where Concentrations Exceeded the EPA MCL during Calendar Years 2019 to 2024 6-31

Figure 7-1 Location of the Burn Site Groundwater Area of Concern 7-3

Figure 7-2 Localized Potentiometric Surface of the Burn Site Groundwater Area of Concern (October 2024) 7-6

Figure 7-3 Conceptual Site Model for the Burn Site Groundwater Area of Concern 7-9

Figure 7-4 Nitrate Plus Nitrite Concentration Contour Map of the Burn Site Groundwater Area of Concern, October/November 2024 7-18

Chapter Tables

Table 1-1 Sampling Events Conducted for Groundwater Monitoring at Sandia National Laboratories, New Mexico, Calendar Year 2024 1-9

Table 1-2 Summary of Sandia National Laboratories, New Mexico Groundwater Monitoring Analytical Results, Calendar Year 2024 1-10

Table 1-3 Exceedances for Sandia National Laboratories, New Mexico Monitoring Wells and Springs Sampled in Calendar Year 2024 1-13

Table 1-4 Field Water Quality Parameters Measured at Monitoring Wells 1-16

Table 1-5 Chemical Analytical Methods 1-17

Table 1-6 Radiochemical Analytical Methods 1-18

Table 1-7 Quality Control Sample Types for Groundwater Sampling and Analysis 1-19

Table 2-1 Water Levels Measured by Sandia National Laboratories, New Mexico and Other Agencies in Calendar Year 2024 2-7

Table 2-2 Precipitation Data for Kirtland Air Force Base, Calendar Years 2023 and 2024 2-8

Table 2-3 Total Kirtland Air Force Base Groundwater Production, Calendar Years 2023 and 2024 2-8

Table 3-1 Chemical Waste Landfill Monitoring Well Network and Calendar Year 2024 Compliance Activities 3-3

Table 3-2 Groundwater Elevation Data for Chemical Waste Landfill Monitoring Wells Completed in the Regional Aquifer, October 2024 3-5

Table 3-3 Analytes for Chemical Waste Landfill Monitoring Wells, Calendar Year 2024 3-7

Table 4-1 Mixed Waste Landfill Monitoring Well Network and Calendar Year 2024 Compliance Activities 4-4

Table 4-2 Groundwater Elevation Data for Mixed Waste Landfill Monitoring Wells Completed in the Regional Aquifer, October 2024 4-6

Table 4-3 Analytes for Mixed Waste Landfill Monitoring Wells, Calendar Year 2024 4-7

Table 5-1 Groundwater Monitoring and Injection Wells Screened in the Regional Aquifer in the Technical Area-V Groundwater Area of Concern 5-4

Table 5-2 Groundwater Elevation Data for the Technical Area-V Groundwater Area of Concern, October 2024 5-10

Table 5-3 Wastewater and Septic Water Disposal History for Technical Area-V 5-12

Table 5-4 Technical Area-V Groundwater Area of Concern Monitoring Well Network and Sampling Dates, Calendar Year 2024 5-18

Table 5-5 Analytes for Technical Area-V Groundwater Area of Concern Monitoring Wells, Calendar Year 2024 5-18

Table 6-1 Groundwater Monitoring Conducted in the Tijeras Arroyo Groundwater Area of Concern in Calendar Year 2024 in Accordance with the TAG CMI Plan (Revised) 6-5

Table 6-2 Comparison of Hydrogeologic Characteristics of the Perched Groundwater System and Regional Aquifer in the Vicinity of the Tijeras Arroyo Groundwater Area of Concern 6-9

Table 6-3 Groundwater Elevation Data for Monitoring and Remediation Wells Located in the Vicinity of the Tijeras Arroyo Groundwater Area of Concern, October 2024 6-15

Chapter Tables (concluded)

Table 6-4 Annual Decline Rates for Groundwater Elevations at Perched Groundwater System Monitoring Wells in the Tijeras Arroyo Groundwater Area of Concern 6-19

Table 6-5 Tijeras Arroyo Groundwater Area of Concern Monitoring Well Network and Sampling Dates, Calendar Year 2024 6-25

Table 6-6 Analytes for Tijeras Arroyo Groundwater Area of Concern Monitoring Wells, Calendar Year 2024 6-26

Table 6-7 Tijeras Arroyo Groundwater Area of Concern Monitoring Wells Where Nitrate Plus Nitrite Concentrations Exceeded the EPA MCL in Calendar Year 2024 6-27

Table 6-8 Maximum Nitrate Plus Nitrite Concentrations for Perched Groundwater System Monitoring Wells in the Tijeras Arroyo Groundwater Area of Concern Where Concentrations Exceeded the EPA MCL during Calendar Years 2020 to 2024 6-28

Table 6-9 Maximum Nitrate Plus Nitrite Concentrations and Trends for Perched Groundwater System Monitoring Wells in the Tijeras Arroyo Groundwater Area of Concern Where Concentrations Exceeded the EPA MCL in Calendar Year 2024 6-29

Table 7-1 Groundwater Monitoring Wells in the Burn Site Groundwater Area of Concern 7-5

Table 7-2 Groundwater Elevation Data for Burn Site Groundwater Area of Concern Monitoring Wells Completed in the Fractured Bedrock Aquifer System, October 2024 7-12

Table 7-3 Summary of Historical Nitrate Concentration Exceedances of the EPA MCL at Burn Site Groundwater Area of Concern Monitoring Wells 7-14

Table 7-4 Burn Site Groundwater Area of Concern Monitoring Well Network and Sampling Dates, Calendar Year 2024 7-16

Table 7-5 Analytes for Burn Site Groundwater Area of Concern Monitoring Wells, Calendar Year 2024 7-16

Attachments

Attachment 2A	Groundwater Monitoring Program Analytical Results Tables	2A-1
Attachment 2B	Groundwater Monitoring Program Hydrographs and Charts	2B-1
Attachment 2C	Groundwater Monitoring Program Plots	2C-1
Attachment 3A	Chemical Waste Landfill Hydrograph	3A-1
Attachment 3B	Chemical Waste Landfill Analytical Results Tables	3B-1
Attachment 4A	Mixed Waste Landfill Hydrographs	4A-1
Attachment 4B	Mixed Waste Landfill Analytical Results Tables	4B-1
Attachment 5A	Historical Timeline of the Technical Area-V Groundwater Area of Concern	5A-1
Attachment 5B	Technical Area-V Groundwater Area of Concern Analytical Results Tables	5B-1
Attachment 5C	Technical Area-V Groundwater Area of Concern Plots	5C-1
Attachment 5D	Technical Area-V Groundwater Area of Concern Hydrographs	5D-1
Attachment 6A	Historical Timeline of the Tijeras Arroyo Groundwater Area of Concern	6A-1
Attachment 6B	Tijeras Arroyo Groundwater Area of Concern Hydrographs	6B-1
Attachment 6C	Tijeras Arroyo Groundwater Area of Concern Analytical Results Tables	6C-1
Attachment 6D	Tijeras Arroyo Groundwater Area of Concern Plots	6D-1
Attachment 7A	Historical Timeline of the Burn Site Groundwater Area of Concern	7A-1
Attachment 7B	Burn Site Groundwater Area of Concern Analytical Results Tables	7B-1
Attachment 7C	Burn Site Groundwater Area of Concern Plots	7C-1
Attachment 7D	Burn Site Groundwater Area of Concern Hydrographs	7D-1

Tables

1 Inventory of Active and Decommissioned Site-Wide Groundwater Monitoring, Production, and Extraction Wells Located at Sandia National Laboratories, New Mexico, Kirtland Air Force Base, and Surrounding Areas

2 Site-Wide Groundwater Elevations for Active Monitoring Wells Located at Sandia National Laboratories, New Mexico and the Kirtland Air Force Base Vicinity, Calendar Year 2024

Plate

1 Potentiometric Surface for the Regional Aquifer and the Fractured Bedrock System at Sandia National Laboratories, New Mexico and Kirtland Air Force Base for Calendar Year 2024

Data Packages

1 Groundwater Monitoring Program Data Packages, Calendar Year 2024

2 Chemical Waste Landfill Data Packages, Calendar Year 2024

3 Mixed Waste Landfill Data Packages, Calendar Year 2024

4 Technical Area-V Groundwater Area of Concern Data Packages, Calendar Year 2024

5 Tijeras Arroyo Groundwater Area of Concern Data Packages, Calendar Year 2024

6 Burn Site Groundwater Area of Concern Data Packages, Calendar Year 2024

Acronyms and Abbreviations

ABCWUA	Albuquerque Bernalillo County Water Utility Authority
AOC	Area of Concern
ARG	ancestral Rio Grande
BSG	Burn Site Groundwater
CCM	Current Conceptual Model
CME	Corrective Measures Evaluation
COA	City of Albuquerque
COC	constituent of concern
CSM	Conceptual Site Model
CWL	Chemical Waste Landfill
CY	calendar year
DO	dissolved oxygen
DOE	U.S. Department of Energy
DOE/NNSA	U.S. Department of Energy National Nuclear Security Administration
DRO	diesel range organics
EHD	Environmental Health Department
EPA	U.S. Environmental Protection Agency
EPA MCL	U.S. Environmental Protection Agency maximum contaminant level
ERP	Environmental Restoration Program (KAFB)
ET	evapotranspirative
GMP	Groundwater Monitoring Program
GRO	gasoline range organics
HE	high explosive
IMWP	Interim Measures Work Plan
ISB	in-situ bioremediation
JP-4	jet propellant, fuel grade 4
KAFB	Kirtland Air Force Base
LWDS	Liquid Waste Disposal System
MAC	maximum allowable concentration
MDL	method detection limit
MNA	monitored natural attenuation
MWL	Mixed Waste Landfill
NMED	New Mexico Environment Department
NMOSE	New Mexico Office of the State Engineer
NOD	Notice of Disapproval
NPN	nitrate plus nitrite
NTU	nephelometric turbidity units
ORP	oxidation-reduction potential
PCE	tetrachloroethene
PGWS	Perched Groundwater System
pH	potential of hydrogen
PQL	practical quantitation limit
QC	quality control
RCRA	Resource Conservation and Recovery Act
RFI	Resource Conservation and Recovery Act Facility Investigation
RPD	relative percent difference
SC	specific conductivity
SFG	Santa Fe Group
SMO	Sample Management Office

Acronyms and Abbreviations (concluded)

SNL/NM	Sandia National Laboratories, New Mexico
SWMU	Solid Waste Management Unit
TA	Technical Area
TAG	Tijeras Arroyo Groundwater
TAL	Target Analyte List
TAVG	Technical Area-V Groundwater
TCE	trichloroethene
TOX	total organic halogens
VA	Veterans Affairs
VCM	voluntary corrective measure
VOC	volatile organic compound

Units

%	percent
°C	degrees Celsius
µg/L	micrograms per liter
µm	micron
µmho/cm	micromhos per centimeter
amsl	above mean sea level
bgs	below ground surface
ft	foot (feet)
ft/day	feet per day
ft/ft	feet per foot
ft/yr	feet per year
ft^3/yr	cubic feet per year
gal	gallon(s)
gpm	gallons per minute
in, in.	inch(es)
L/min	liters per minute
m	meters
Ma	mega annum (million years)
mg/L	milligrams per liter (equivalent to ppm)
mi^2	square mile(s)
ml	milliliter
mrem/yr	millirems per year
pCi/L	picocuries per liter
yd^3	cubic yards

Well Location Descriptions

12AUP-#	ER Site 12A Underflow Piezometer
ASL-PD	Albuquerque Seismological Laboratory Production (well)
AVN-#	Area-V (North)
BW	Background Well
CCBA-#	Coyote Canyon Blast Area
CTF-#	Coyote Test Field
CWL-#	Chemical Waste Landfill
CYN-#	Canyons (Lurance Canyon area)
Eubank-#	Eubank well
Greystone-#	Greystone well
EX	Well proposed for extraction purposes but used for monitoring purposes only at the KAFB former sewage lagoons. This applies to the well number for ST105-EX01.
HERTF	High Energy Research Test Facility
INJ	injection well
ITRI-MW	Inhalation Toxicology Research Institute
KAFB	Kirtland Air Force Base
LMF-#	Large Melt Facility
LWDS-#	Liquid Waste Disposal System
MRN-#	Magazine Road North
MVMW#	Mountain View Monitoring Well
MW	Monitoring Well
MWL-#	Mixed Waste Landfill
NMED-#	New Mexico Environment Department
NWTA3-#	Northwest Technical Area-III
OBS-#	Old Burn Site
P&A	plugged and abandoned (decommissioned)
PGS-#	Parade Ground South
PL-#	Power Line Road
RG-#	Rio Grande, basin and well designation by the New Mexico Office of the State Engineer
SFR-#	South Fence Road
ST105-MW	KAFB Project ST-105
STW-#	Solar Tower (West)
SWTA3-#	Southwest Technical Area-III
TA1-W-#	Technical Area-I (Well)
TA2-NW-#	Technical Area-II (Northwest)
TA2-SW-#	Technical Area-II (Southwest)
TA2-W-#	Technical Area-II (Well)
TAV-#	Technical Area-V
TAV-INJ	Technical Area-V Injection Well
TJA-#	Tijeras Arroyo
TRE-#	Thunder Road East
TRN-#	Target Road North
TRS-#	Target Road South
TSA-#	Transportation Safeguards Academy
VA-#	Veterans Administration
WYO-#	Wyoming
YALE-MW	Yale Landfill area

Meteorological Towers

A21	SNL/NM Meteorological Station in TA-II
A36	SNL/NM Meteorological Station in TA-III/TA-V
KABQ	National Weather Service Meteorological Station at the Albuquerque International Sunport
LC1	SNL/NM Meteorological Station in Lurance Canyon west of Burn Site
SC1	School House - SNL/NM Meteorological Station in the Manzanita Mountains

1.0 Introduction

Sandia National Laboratories, New Mexico (SNL/NM) personnel monitor the groundwater at SNL/NM for the U.S. Department of Energy National Nuclear Security Administration (DOE/NNSA). This *Annual Groundwater Monitoring Report, Calendar Year 2024* (Report) summarizes the calendar year (CY) 2024 groundwater monitoring results for SNL/NM. The chapters herein focus on the groundwater monitoring activities performed at the following monitoring well networks maintained at SNL/NM:

- Groundwater Monitoring Program (GMP) (Chapter 2.0)
- Chemical Waste Landfill (CWL) (Chapter 3.0)
- Mixed Waste Landfill (MWL) (Chapter 4.0)
- Technical Area-V Groundwater (TAVG) Area of Concern (AOC) (Chapter 5.0)
- Tijeras Arroyo Groundwater (TAG) AOC (Chapter 6.0)
- Burn Site Groundwater (BSG) AOC (Chapter 7.0)

1.1 Site Description

SNL/NM is located on Kirtland Air Force Base (KAFB), New Mexico. KAFB is a 51,559-acre (80.56-mi^2) military installation that includes 20,486 acres withdrawn from the Cibola National Forest through an agreement with the U.S. Forest Service. Located directly southeast of Albuquerque at the foot of the Manzanita Mountains (Figure 1-1), KAFB has an average elevation of 5,384 ft amsl and an elevation range of 5,162 to 7,986 ft amsl.

1.1.1 Climate

The Albuquerque area is characterized by the low precipitation and wide temperature extremes typical of a high-altitude, dry continental climate. The average annual precipitation measured at the Albuquerque International Sunport (National Oceanic and Atmospheric Administration National Weather Service station) is 8.84 in. (Chapter 2.0, Section 2.6.2.1). Most of the precipitation falls between July and September, mainly in the form of brief heavy rain. The evaporation potential is high because of the low humidity and generally warm temperatures.

1.1.2 Geologic Setting

SNL/NM is located near the east-central edge of the Albuquerque Basin. The Albuquerque Basin (also known as the Middle Rio Grande Basin) is one of a series of north-south trending basins that was formed during the extension of the Rio Grande Rift. The basin is approximately 3,000 mi^2. Rift formation began in the late Oligocene and continued into the early Pleistocene, with the primary period of extension occurring between 30 and 5 Ma, or million years ago. The tectonic activity, which uplifted the Sandia, Manzanita, and Manzano Mountains, was most prevalent from about 15 to 5 Ma (Thorn et al., 1993). The rift today extends from south-central Colorado across New Mexico and into northern Mexico. The vertical displacement between the rock units at the top of Sandia Crest and the equivalent units at the bottom of the buried basin is more than 6 mi (Lozinsky, 1994).

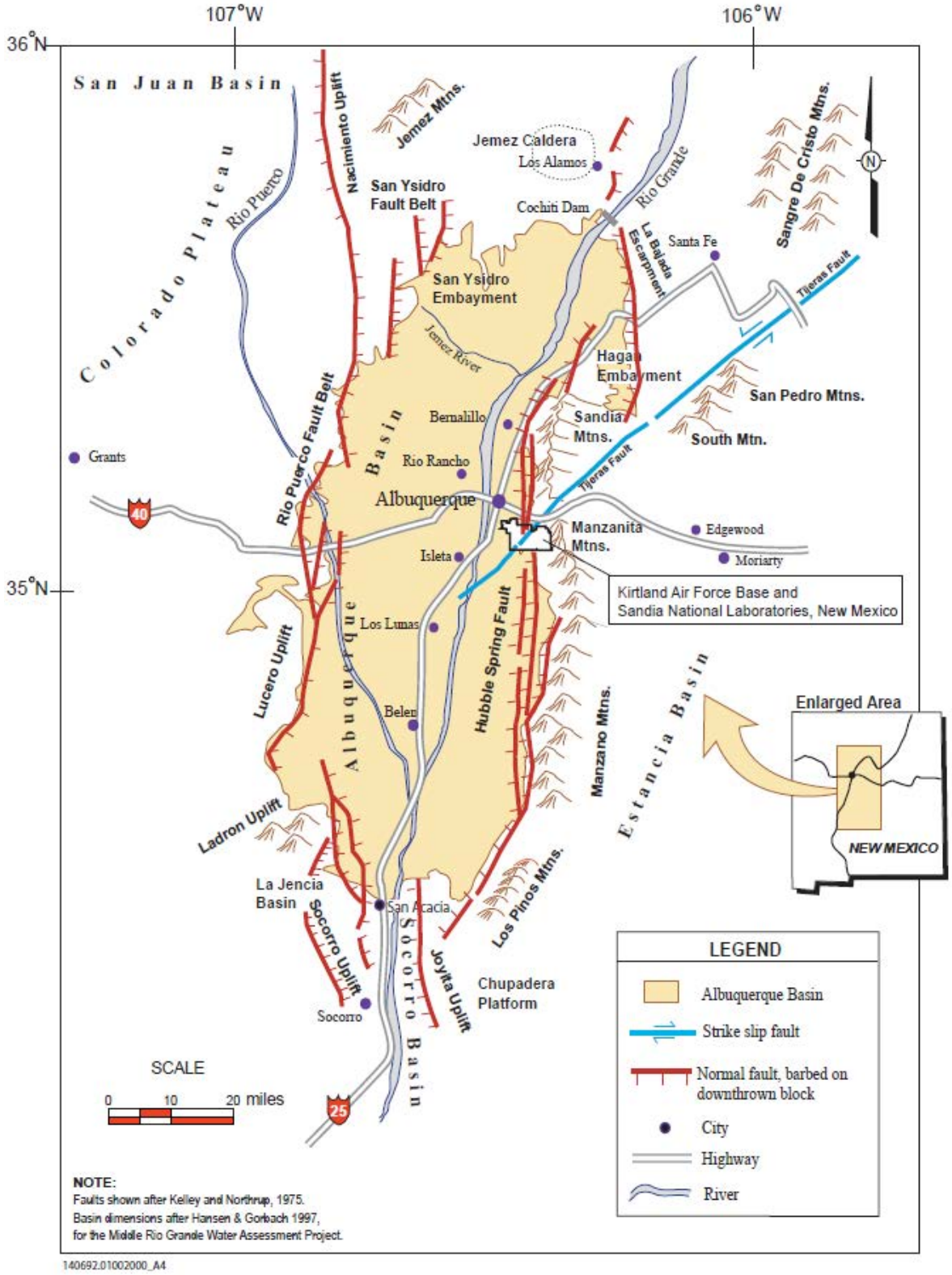


Figure 1-1
Albuquerque Basin, North Central New Mexico

As Figure 1-1 shows, the structural boundaries of the Albuquerque Basin are the:

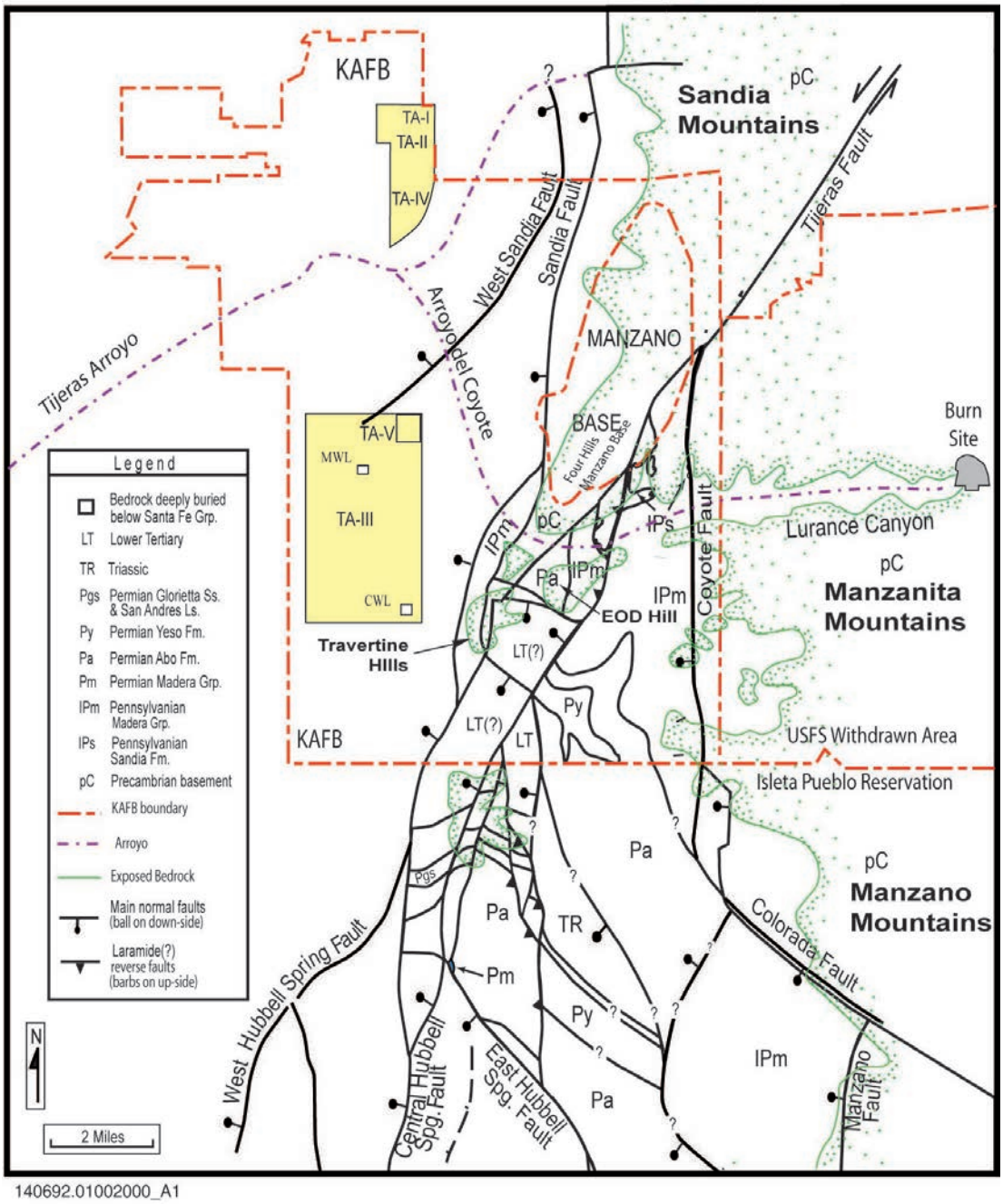
- Colorado Plateau to the west.
- Nacimiento Uplift and Jemez Mountains to the north.
- La Bajada Escarpment to the northeast.
- Sandia, Manzanita, Manzano, and Los Pinos Mountains to the east.
- Joyita and Socorro uplifts to the south.
- Ladron and Lucero uplifts to the southwest.

As the Rio Grande Rift expanded, the Albuquerque Basin subsided. Over the last 30 Ma, the ancestral Rio Grande meandered across the valley formed by the subsidence and deposited sediments in broad stream channels and floodplains derived from sources to the north. The basin also filled with aeolian deposits and alluvial materials shed from surrounding uplifts (Hawley and Haase, 1992). This sequence of sediments is called the Santa Fe Group (SFG). The thickness of the SFG is up to 16,400 ft at the deepest part of the basin (Lozinsky, 1994). The entire sequence consists of unconsolidated sediments, which thin toward the edge of the basin and are truncated by normal faults at the basin-bounding uplifts. Units overlying the SFG include Pliocene Ortiz gravel and Rio Grande fluvial deposits, which are interbedded with Tertiary and Quaternary basaltic and pyroclastic materials. Based on recent geophysical models, the basin has been further divided into three 2- to 4-mi-deep interconnected structural depressions from north to south: the Santo Domingo subbasin, the Calabacillas subbasin, and the Belen subbasin. KAFB lies near the intersection of the Calabacillas and Belen subbasins along a broad, northwest elongate structural high called the Mountainview prong, which separates the two subbasins (Grauch and Connell, 2013). These tectonic/sedimentary features contribute greatly to the complex structural setting described below.

There are four primary faults (Figures 1-2 and 1-3) on KAFB: the Sandia Fault, the West Sandia Fault, the Hubbell Spring Fault (West, Central, and East Fault segments), and the Tijeras Fault. The Sandia Fault is thought to be the primary boundary between the Sandia Mountains and the Albuquerque Basin. The Hubbell Spring Fault extends northward from Socorro County and terminates on KAFB near the Tijeras Fault. The Sandia and Hubbell Spring Faults, which are en echelon normal faults with down-to-the-west displacement, trend north-south and bound the basin on the east side.

The Tijeras Fault is an ancient strike-slip fault that developed in the Precambrian or early Paleozoic (approximately 600 Ma) and was reactivated in association with the Laramide Orogeny during the Cretaceous period (Kelley, 1977). The fault demonstrates Quaternary movement at locations northeast of KAFB (Kelson et al., September 1999; GRAM and Lettis, December 1995), has been traced as far north as Madrid, New Mexico, and continues into the Sangre de Cristo Mountains as the Cañoncito Fault. Preferential erosion along the fault formed Tijeras Canyon, which divides the Sandia and Manzanita Mountains.

The Tijeras Fault trends southwestward from Tijeras Canyon, intersects the northeast boundary of KAFB, and crosses KAFB east and south of Manzano Base. Manzano Base occupies a four-peak uplift defined by the Tijeras Fault on the east side and the Sandia Fault on the west side. The Sandia, Hubbell Spring, and Tijeras Faults converge near the southeast end of Technical Area (TA)-III. This complicated fault system defines the eastern edge of the Albuquerque basin and is referred to as the Tijeras Fault Complex.



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Figure 1-2
Generalized Geology in the Vicinity of Sandia National Laboratories, New Mexico and Kirtland Air Force Base (Van Hart, June 2003)

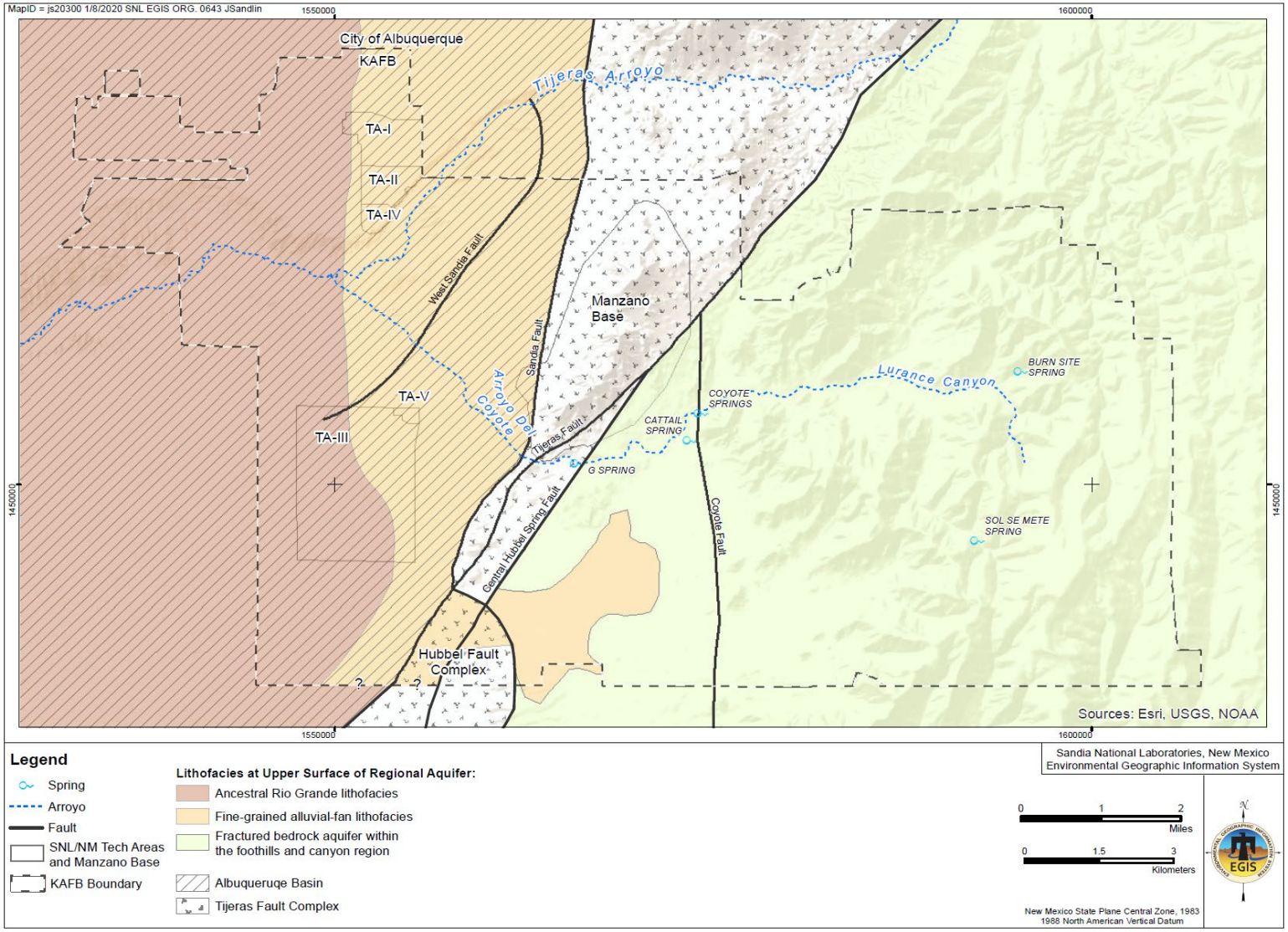


Figure 1-3
Hydrogeologically Distinct Areas Controlled by Faults
(Modified from GRAM and Lettis, December 1995, and Van Hart, June 2003)

1.1.3 Hydrogeology

There are three hydrogeologically distinct areas in the vicinity of KAFB (Figure 1-3): the Albuquerque Basin, the Tijeras Fault Complex, and the foothills and canyon region. The primary division is between the east and west sides of the Tijeras Fault Complex, which is the transitional zone. This division marks the boundary between the Regional Aquifer in the Albuquerque Basin and the fractured bedrock aquifer system in the foothills and canyon region. A Perched Groundwater System (PGWS) (Chapter 6.0) lies above the Regional Aquifer near TA-I, TA-II, and TA-IV in the TAG AOC. The PGWS extends southeastward from the former KAFB sewage lagoons to the KAFB Tijeras Arroyo Golf Course and crosses TA-I, TA-II, and TA-IV, where the gradient averages approximately 0.01 ft/ft (ft of vertical change per ft of horizontal distance) in the sediments. Possible recharge sources for the PGWS include the former KAFB sewage lagoons, landscape watering, arroyo surface water, wastewater outfalls, buried septic systems, the KAFB Tijeras Arroyo Golf Course, and possible leakage from water distribution and sewer lines (SNL/NM, February 2018).

East of the Tijeras Fault Complex, a thin layer of alluvium covers the bedrock. The hydrogeology in this area is poorly understood due to the complex geology created by the fault system. In this area, the depth to groundwater ranges from 45 to 360 ft bgs and most of the non-potable production and monitoring wells are completed in fractured bedrock at relatively shallow depths and produce modest volumes of groundwater.

The groundwater in the fractured bedrock aquifer system generally flows westward from the foothills and canyon region toward the Tijeras Fault Complex (Plate 1). The groundwater gradient is relatively steep, 0.03 ft/ft. From the mountain front to Wyoming Boulevard, the gradient averages approximately 0.005 ft/ft in the unconsolidated sediments of the Regional Aquifer, and west of Wyoming Boulevard, the gradient flattens to an average of approximately 0.002 ft/ft in the coarser-grained facies of these unconsolidated sediments.

Historically, the regional groundwater in the Albuquerque Basin flowed westward from the mountains toward the Rio Grande. However, pumping by KAFB, Veterans Affairs, and Albuquerque Bernalillo County Water Utility Authority (ABCWUA) production wells has created a trough in the Regional Aquifer near the northwest corner of KAFB, causing the groundwater to flow northward toward these wells. The impact of the groundwater withdrawal has been observed as minor fluctuations in the groundwater elevations at SNL/NM and KAFB monitoring wells as far southeast as TA-III.

1.1.4 Surface Water Hydrology

The major surface water feature in the vicinity of KAFB is the Rio Grande. Located approximately 3 mi west of KAFB, the Rio Grande originates in the San Juan Mountains of Colorado and terminates at the Gulf of Mexico, near Brownsville, Texas. Approximately 1,900 mi long, the Rio Grande is the fourth longest river system in the United States.

Except for several springs, surface water within the boundaries of KAFB is found only as ephemeral streams (arroyos) that flow for short periods after storm events or during the spring melt of mountain snowpack. The primary surface water feature that drains the eastern foothills on KAFB is Tijeras Arroyo. Arroyo del Coyote intersects Tijeras Arroyo just south of TA-IV (about 1 mi west of the KAFB Tijeras Arroyo Golf Course [Figure 1-3]). Both Tijeras Arroyo and Arroyo del Coyote carry significant runoff after heavy thunderstorms that usually occur from July through September. Above the Tijeras Arroyo-Arroyo del Coyote confluence, Tijeras Arroyo drains about 80 mi^2, while Arroyo del Coyote drains about 39 mi^2 (USACE, 1979). The total watershed for Tijeras Arroyo, including the Sandia and Manzanita Mountains and parts of KAFB, is approximately 126 mi^2. All active SNL/NM facilities are located outside the 100-year Tijeras Arroyo and Arroyo del Coyote floodplains.

There are five springs on KAFB associated with the uplifts in the Tijeras Fault Complex and foothills and canyon region (Figure 1-3): Coyote Springs, Cattail Spring, and G Spring in Arroyo del Coyote; Burn Site Spring in Lurance Canyon; and Sol se Mete Spring in the Manzanita Mountains. Coyote Springs and Sol se Mete Spring are perennial (continuously flowing) springs, while the other springs are ephemeral springs. Hubbell Spring (a perennial spring) is located just south of KAFB on the Pueblo of Isleta (Figure 1-4). The wetland areas created by these springs, though very limited in extent, provide a unique ecological niche in an otherwise arid habitat.

Groundwater recharge near KAFB is primarily derived from the eastern mountain front and the major arroyos. However, the amount of recharge occurring in the foothills and canyon region is not well characterized. The estimated recharge for that part of Tijeras Arroyo is 2.2 million ft^3/yr (50 acre-ft/yr) (SNL/NM, February 1998). The estimated recharge for Arroyo del Coyote is 0.4 million ft^3/yr (9.2 acre-ft/yr). Infiltration studies conducted during the Site-Wide Hydrogeologic Characterization Project (SNL/NM, February 1998) determined that due to the high evapotranspiration rate for most areas on KAFB (especially the alluvial fan slopes and other relatively flat areas), recharge from direct precipitation is negligible.

1.2 Groundwater Monitoring

1.2.1 Groundwater Monitoring Agencies

The groundwater at KAFB and SNL/NM is monitored by two agencies, respectively: the U.S. Department of Defense through the KAFB Environmental Restoration Program (ERP) and the DOE/NNSA through SNL/NM.

KAFB ERP personnel monitor the groundwater at KAFB through a large monitoring well network associated with several closed landfills and the Former KAFB Sewage Lagoons, as well as additional KAFB wells sited to monitor and characterize several nitrate plumes and an extensive aviation gasoline/jet fuel plume associated with the KAFB Bulk Fuels Facility.

SNL/NM personnel monitor the groundwater at SNL/NM on a site-wide basis through the GMP monitoring well network and on a site-specific basis through the CWL, MWL, TAVG AOC, TAG AOC, and BSG AOC monitoring well networks. These networks cover locations associated with DOE/NNSA-owned facilities and sites permitted by the U.S. Air Force for DOE/NNSA use.

Figure 1-4 and Plate 1 show the monitoring well networks located at KAFB and SNL/NM. Tables 1 and 2 present the construction specifications and CY 2024 groundwater elevation data for the monitoring wells, respectively.

Table 1-1 lists the sampling events conducted at SNL/NM in CY 2024 for groundwater monitoring; Table 1-2 summarizes the analytical results. Table 1-3 lists the analytes that exceeded the U.S. Environmental Protection Agency maximum contaminant levels (EPA MCLs) (EPA, March 2018) and/or the New Mexico Water Quality Control Commission maximum allowable concentrations (MACs) (NMWQCC, December 2018). The EPA MCLs and MACs are the federal and state regulatory standards for drinking water and groundwater, respectively.

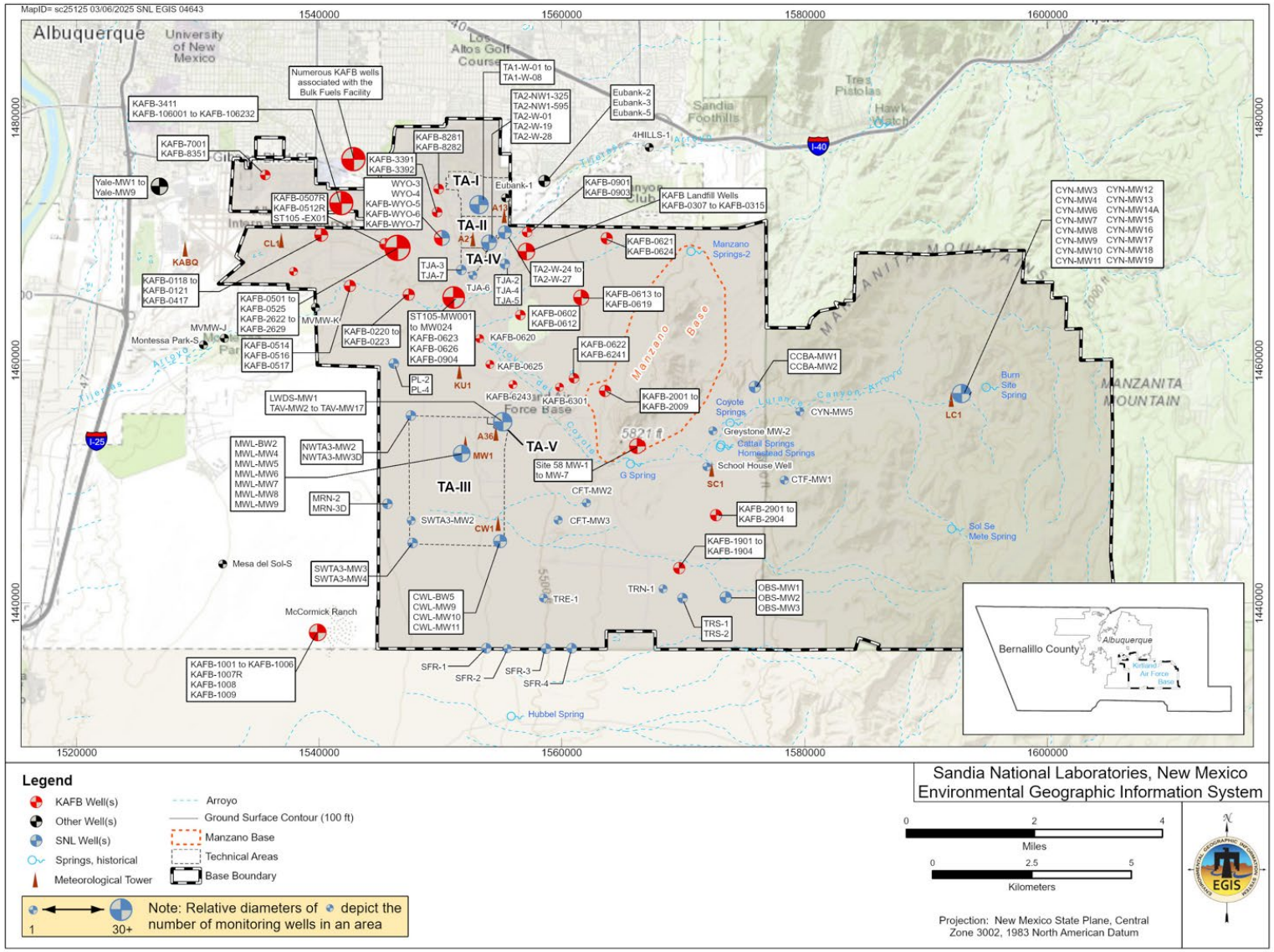


Figure 1-4
Wells and Springs within Sandia National Laboratories, New Mexico and Kirtland Air Force Base

Table 1-1
Sampling Events Conducted for Groundwater Monitoring at
Sandia National Laboratories, New Mexico, Calendar Year 2024

2024 Sampling Event	GMP	CWL	MWL	TAVG AOC	TAG AOC	BSG AOC
January		✓		✓		
February				✓	✓	
March					✓	
April	✓					
May	✓		✓			✓
June						✓
July		✓		✓		
August				✓	✓	
September					✓	
October			✓			✓
November						✓
December						

Notes:
AOC = Area of Concern
BSG = Burn Site Groundwater
CWL = Chemical Waste Landfill
GMP = Groundwater Monitoring Program
MWL = Mixed Waste Landfill
TAG = Tijeras Arroyo Groundwater
TAVG = Technical Area-V Groundwater

Table 1-2
Summary of Sandia National Laboratories, New Mexico Groundwater Monitoring Analytical Results, Calendar Year 2024

SNL/NM Groundwater Monitoring	
Number of Active Wells Sampled	74
Number of Analyses Performed	8638
Percent of Non-Detected Results	82%

Analyte	Number of Detections	Number of Non-Detections	Minimum Detected Value	Maximum Detected Value	Mean Detected Value	EPA MCL
Field Water Quality Parameters (measured before sample collection)						
pH in SU	121	0	6.15	7.91	7.36	NE
Specific Conductivity in µmho/cm	121	0	321.05	4110	793.7	NE
Temperature in °C	121	0	12.05	28.74	19.68	NE
Turbidity in NTU	NA	NA	0.02	13.7	0.86	NE
Detected Organic Compounds in µg/L						
Chloroform	8	96	0.340	2.65	1.288	80.0[a]
Dichloroethane, 1,1-	1	98	4.12	4.12	4.12	NE
Dichloroethene, 1,1-	2	102	1.34	1.97	1.66	7.00
Dichloroethene, cis-1,2-	18	81	0.360	5.36	1.176	70.0
Diesel Range Organics	2	31	102	103	102.5	NE
Methylene Chloride	1	98	0.680	0.680	0.680	5.00
Tetrachloroethene	3	101	0.580	11.6	4.513	5.00
Toluene	4	95	0.400	0.690	0.505	1000
Trichloroethene	35	74	0.380	18.5	4.123	5.00
Detected Organic Compounds in mg/L						
Perchlorate	1	0	0.000826	0.000826	0.000826	NE
Detected Inorganic Compounds and Parameters in mg/L						
Nitrate plus Nitrite	131	0	0.116	34.0	7.658	10.0
Bromide	71	0	0.167	4.30	0.670	NE
Chloride	71	0	11.1	471	57.9	NE
Fluoride	70	1	0.262	2.08	0.946	4.00
Sulfate	71	0	16.8	2100	119.4	NE
Total Organic Halogens	11	10	0.00624	0.068	0.02616	NE
Total Phenols	4	8	0.00427	0.0645	0.02442	NE
Alkalinity (as $CaCO_3$)	71	0	80.8	1020	206.3	NE

See notes at end of table.

Table 1-2 (continued)
Summary of Sandia National Laboratories, New Mexico Groundwater Monitoring Analytical Results, Calendar Year 2024

Analyte	Number of Detections	Number of Non-Detections	Minimum Detected Value	Maximum Detected Value	Mean Detected Value	EPA MCL
Detected Metals in mg/L						
Aluminum	10	61	0.0199	0.343	0.1088	NE
Antimony	4	67	0.00111	0.00143	0.00129	0.006
Arsenic	20	51	0.00201	0.00818	0.00282	0.010
Barium	71	0	0.00822	0.225	0.06817	2.00
Beryllium	3	68	0.000216	0.00718	0.003099	0.004
Cadmium	2	77	0.000357	0.000523	0.000440	0.005
Calcium	71	0	36.6	329	88.1	NE
Chromium	7	84	0.00313	0.0355	0.01172	0.100
Cobalt	4	67	0.000404	0.00935	0.003076	NE
Copper	15	56	0.000301	0.00606	0.001164	NE
Iron	20	51	0.0336	0.255	0.0805	NE
Magnesium	71	0	3.29	61.5	20.27	NE
Manganese	20	49	0.0011	1.35	0.0746	NE
Mercury	1	91	0.000141	0.000141	0.000141	0.002
Molybdenum	1	0	0.00867	0.00867	0.00867	NE
Nickel	13	78	0.000608	0.0235	0.003928	NE
Potassium	71	0	1.44	28.8	3.56	NE
Selenium	55	16	0.00167	0.0318	0.00504	0.050
Sodium	71	0	14.3	1090	62.4	NE
Thallium	1	70	0.00120	0.00120	0.00120	0.002
Uranium	57	0	0.00103	0.00928	0.00382	0.030
Vanadium	62	9	0.00341	0.0119	0.00623	NE
Zinc	15	56	0.00337	0.0408	0.01130	NE

See notes at end of table.

Table 1-2 (concluded)
Summary of Sandia National Laboratories, New Mexico Groundwater Monitoring Analytical Results, Calendar Year 2024

Analyte	Number of Detections	Number of Non-Detections	Minimum Detected Value	Maximum Detected Value	Mean Detected Value	EPA MCL
Detected Radiological Parameters in pCi/L						
Alpha, gross (corrected)	76	5	-8.15	10.4	0.07	15[b]
Beta, gross	78	3	1.53	30.4	5.79	4 mrem/yr
Cobalt-60	1	80	-1.33	-1.33	-1.33	NE
Potassium-40	10	70	34.2	72.5	51.8	NE
Radium-226	18	3	0.502	3.83	1.650	5[c]
Radium-228	13	8	0.440	1.31	0.810	5[c]
Radon-222	9	1	136	464	296	NE
Uranium-233/234	24	0	0.373	28.0	12.376	NE
Uranium-235/236	19	5	0.126	0.559	0.279	NE
Uranium-238	23	1	0.205	5.70	2.539	NE

Notes:
Only includes analytes that had validated detections.
[a] The 80.0 µg/L EPA MCL is for combined trihalomethanes.
[b] The 15.0 pCi/L EPA MCL is for corrected gross alpha activity.
[c] The 5.0 pCi/L EPA MCL is for combined radium-226 and radium-228.
4 mrem/yr = any combination of beta- and/or gamma-emitting radionuclides (as dose rate)
°C = degrees Celsius
% = percent
µg/L = micrograms per liter
µmho/cm = micromhos per centimeter
$CaCO_3$ = calcium carbonate
corrected = gross alpha results reported as corrected values (uranium activities subtracted out)
EPA = U.S. Environmental Protection Agency
MCL = maximum contaminant level
mg/L = milligrams per liter
mrem/yr = millirems per year
NA = not applicable
NE = not established
NTU = nephelometric turbidity units
pCi/L = picocuries per liter
pH = potential of hydrogen
rem = roentgen equivalent man
SNL/NM = Sandia National Laboratories, New Mexico
SU = standard units

Table 1-3
Exceedances for Sandia National Laboratories, New Mexico
Monitoring Wells and Springs Sampled in Calendar Year 2024

Analyte	Well (Relevant Chapter)	Exceedance	Date
Beryllium EPA MCL/MAC = 0.004 mg/L	Coyote Springs (Ch. 2)	0.00718 mg/L[a]	April 2024
Fluoride MAC = 1.6 mg/L	OBS-MW1 (Ch. 2)	2.08 mg/L	April 2024
	SFR-2S (Ch. 2)	1.62 mg/L	April 2024
	SWTA3-MW4 (Ch.2)	1.71 mg/L	April 2024
Nitrate plus Nitrite EPA MCL = 10 mg/L	CYN-MW9 (Ch. 7)	33.5 mg/L	June 2024
		34.0 mg/L	October 2024
	CYN-MW10 (Ch. 7)	23.9 mg/L	June 2024
		21.0 mg/L	October 2024
	CYN-MW10 (Duplicate) (Ch. 7)	24.3 mg/L	October 2024
	CYN-MW12 (Ch. 7)	17.0 mg/L	June 2024
		16.9 mg/L	October 2024
	CYN-MW12 (Duplicate) (Ch. 7)	22.6 mg/L	October 2024
	CYN-MW13 (Ch. 7)	23.8 mg/L	June 2024
		24.5 mg/L	October 2024
	CYN-MW14A (Ch. 7)	11.8 mg/L	June 2024
		11.4 mg/L	October 2024
	CYN-MW14A (Duplicate) (Ch. 7	11.9 mg/L	June 2024
	LWDS-MW1 (Ch. 5)	12.0 mg/L	February 2024
		12.4 mg/L	August 2024
	LWDS-MW1 (Duplicate) (Ch. 5)	12.0 mg/L	February 2024
	TA2-W-19 (Ch. 6)	12.3 mg/L	February 2024
		13.5 mg/L	September 2024
	TA2-W-28 (Ch. 6)	17.4 mg/L	March 2024
		17.3 mg/L	September 2024
	TAV-MW10 (Ch. 5)	12.9 mg/L	February 2024
		12.4 mg/L	August 2024
	TJA-2 (Ch. 6)	11.7 mg/L	March 2024
		13.0 mg/L	September 2024
	TJA-4 (Ch. 6)	32.1 mg/L	September 2024
	TJA-4 (Duplicate) (Ch. 6)	32.5 mg/L	September 2024
	TJA-5 (Ch. 6)	12.6 mg/L	March 2024
		14.2 mg/L	September 2024
	TJA-7 (Ch. 6)	20.7 mg/L	March 2024
		21.9 mg/L	September 2024
	TJA-7 (Duplicate) (Ch. 6)	20.6 mg/L	March 2024
Tetrachloroethene EPA MCL = 5.0 µg/L	TA2-W-26 (Ch. 6)	11.6 µg/L	November 2024
Trichloroethene EPA MCL = 5.0 µg/L	LWDS-MW1 (Ch. 5)	5.58 µg/L	February 2024
		6.11 µg/L	August 2024
	LWDS-MW1 (Duplicate) (Ch. 5)	6.60 µg/L	February 2024
	TA2-W-26 (Ch. 6)	18.5 µg/L	November 2024
	TAV-MW4 (Ch. 5)	5.70 µg/L	February 2024
		6.31 µg/L	August 2024
	TAV-MW6 (Ch. 5)	7.64 µg/L	February 2024
		7.86 µg/L	August 2024
	TAV-MW8 (Ch. 5)	5.11 µg/L	August 2024
	TAV-MW10 (Ch. 5)	9.11 µg/L	February 2024
		8.82 µg/L	August 2024
	TJA-7 (Ch. 6)	5.29 µg/L	September 2024

See notes at end of table.

Table 1-3 (concluded)
Exceedances for Sandia National Laboratories, New Mexico
Monitoring Wells and Springs Sampled in Calendar Year 2024

Notes:
[a] analytical result for filtered water sample (all other analytical results are for unfiltered water samples)
µg/L = micrograms per liter
Ch. = Chapter
CYN = Canyons
EPA = U.S. Environmental Protection Agency
LWDS = Liquid Waste Disposal System
MAC = maximum allowable concentration
MCL = maximum contaminant level
mg/L = milligrams per liter
MW = Monitoring Well
W = Well
TAV = Technical Area V
TJA = Tijeras Arroyo

This Report includes groundwater monitoring data for both hazardous and radioactive constituents; however, the monitoring data for radionuclides is provided voluntarily by DOE/NNSA and SNL/NM personnel. The voluntary inclusion of such radionuclide information shall not be enforceable and shall not constitute the basis for any enforcement because such information falls wholly outside the requirements imposed by the New Mexico Environment Department (NMED).

1.2.2 Regulatory Requirements

Groundwater monitoring at SNL/NM is subject to the following four sets of regulatory requirements:

- *Resource Conservation and Recovery Act Facility Operating Permit for Sandia National Laboratories, EPA ID No. NM5890110518* (RCRA Permit) (NMED, January 2015, as modified)
- *Compliance Order on Consent Pursuant to the New Mexico Hazardous Waste Act 74-4-10: Sandia National Laboratories Consent Order* (Consent Order) (NMED, April 2004)
- *Hazardous Waste Permit, EPA ID No. NM5890110518, to the U.S. Department of Energy and Sandia Corporation, for Sandia National Laboratories, Located in Bernalillo County New Mexico* (Chemical Waste Landfill Post-Closure Care Permit [CWL PCCP]) (NMED, October 2009, as modified)
- Comprehensive site-wide groundwater monitoring plan submitted to the NMED annually.

1.2.2.1 Groundwater Monitoring Program

The GMP manages the comprehensive groundwater elevation monitoring at SNL/NM, as well as site-wide monitoring well information. The GMP monitoring well network includes the test wells, monitoring wells, and springs identified in the Consent Order as adequate for establishing background groundwater quality and understanding the general hydrogeologic system at SNL/NM. All GMP groundwater monitoring activities are performed and documented in accordance with the Consent Order and the comprehensive site-wide groundwater monitoring plan.

1.2.2.2 Chemical Waste Landfill

The CWL is a 1.9-acre remediated hazardous waste landfill undergoing post-closure care in accordance with the CWL PCCP, which took effect on June 2, 2011 (NMED, June 2011). All CWL groundwater monitoring activities are performed and documented in accordance with the CWL PCCP.

1.2.2.3 Mixed Waste Landfill

The MWL is a 2.6-acre Solid Waste Management Unit (SWMU) that underwent corrective action in accordance with the Consent Order and was granted Corrective Action Complete with Controls status on March 13, 2016 (NMED, February 2016a). All MWL groundwater monitoring activities are performed and documented in accordance with the *Long-Term Monitoring and Maintenance Plan for the Mixed Waste Landfill* (SNL/NM, March 2012, as modified), which took effect on January 8, 2014 (NMED, January 2014) and is incorporated into the RCRA Permit (NMED, February 2016b).

1.2.2.4 Groundwater Areas of Concern

The TAVG, TAG, and BSG AOCs are areas that may have had a hazardous waste or hazardous constituent release but are not SWMUs. All three AOCs are undergoing corrective action, with all groundwater monitoring activities performed and documented in accordance with the Consent Order and the comprehensive site-wide groundwater monitoring plan. Each AOC investigation must meet the Consent Order requirements for site characterization and the development of a Corrective Measures Evaluation.

In addition to groundwater monitoring requirements, the Consent Order sets forth requirements for installing and decommissioning monitoring wells in the AOCs, as well as recommendations for informing the public about each AOC's status. Recent efforts to inform the public about each AOC's status include presentations at DOE/NNSA in-person and virtual public meetings held in April 2024 and October 2024, respectively.

1.3 Field and Analytical Procedures and Methods

The following sections describe how the CY 2024 groundwater data were collected and analyzed. The procedures and methods for collecting and analyzing the groundwater data are consistent with those the EPA sets forth in its *RCRA Ground-Water Monitoring Technical Enforcement Guidance Document* (EPA, 1986a) and, unless otherwise specified, were implemented by SNL/NM personnel. Chapters 2.0 through 7.0 present the site-specific variances in the procedures and methods.

1.3.1 Field Procedures and Measurements

1.3.1.1 Water Level Measurements

Water levels were measured in accordance with the applicable field procedure to determine groundwater flow directions, hydraulic gradients, and groundwater elevations. Chapters 2.0 through 7.0 present the water level information. The groundwater elevation data were used to construct the CY 2024 potentiometric surface maps and hydrographs.

1.3.1.2 Well Purging and Field Water Quality Parameter Measurements

A portable Bennett groundwater sampling system was used to collect the groundwater samples from the monitoring wells. The minimum purge volume requirement for the portable piston pump is one saturated screen volume (including annulus). The field water quality parameters measured (Table 1-4) consisted of dissolved oxygen (DO), oxidation-reduction potential (ORP), potential of hydrogen (pH), specific conductivity (SC), temperature, and turbidity. Temperature, SC, ORP, pH, and DO were measured with an In-Situ Aqua TROLL 600 multiparameter water quality sonde. Turbidity was measured with a HACH Model 2100Q turbidity meter. The measurements for each monitoring well were recorded during purging. Purging continued until the parameters met the stability criteria (Table 1-4).

Table 1-4
Field Water Quality Parameters Measured at Monitoring Wells

Parameter	Comments
Dissolved Oxygen	Percentage of saturation value and/or measured in mg/L.
Oxidation-Reduction Potential	Measured in mV.
pH	Stability criterion: Four consecutive measurements within 0.1 pH units.
Sample Flow Rate	Measured in gpm.
Specific Conductivity (µmho/cm)	Stability criterion: Four consecutive measurements within 5%.
Temperature (°C)	Stability criterion: Four consecutive measurements within 1°C.
Turbidity (NTU)	Stability criterion: Four consecutive measurements within 10% or less than 5 NTU.

Notes:

°C	= degrees Celsius	mg/L	= milligrams per liter
%	= percent	mV	= millivolts
µmho/cm	= micromhos per centimeter	NTU	= nephelometric turbidity unit
gpm	= gallons per minute	pH	= potential of hydrogen

Due to severely low hydraulic conductivities, several monitoring wells purged dry before the minimum purge volume was removed. These monitoring wells were allowed to recover overnight before sample collection to ensure collection of the most representative groundwater samples possible given the low yields. The field measurement logs documenting the well purging details and field water quality parameter measurements for each sampling event were submitted to the SNL/NM Customer Funded Records Center (CFRC) for retention.

1.3.1.3 Pump Decontamination

The sampling pump and tubing bundle associated with the portable Bennett groundwater sampling system were decontaminated in accordance with the applicable field procedure before they were placed in each monitoring well. Equipment blank samples (Section 1.3.4.2) were collected to verify decontamination.

1.3.1.4 Sample Collection

The groundwater samples were collected with a nitrogen gas-powered portable piston pump (Bennett). The sample containers were filled directly from the pump discharge line and water sampling manifold.

1.3.1.5 Sample Handling and Shipment

The groundwater samples were submitted to the SNL/NM Sample Management Office (SMO) for processing and shipment to an offsite analytical laboratory (GEL Laboratories, LLC) for analysis. The SMO staff obtains sample containers, issues sample control and tracking numbers, tracks chain-of-custody forms, and reviews analytical laboratory data packages to determine method, contract, and regulatory project-specific compliance.

The analytical laboratory analyzed the groundwater samples using the applicable EPA and DOE-specified methods and protocols (Section 1.3.2) and reported the associated quality control (QC) data, which were reviewed against the applicable quality assurance requirements. Data Packages 1 through 6 provide the data validation reports and Level-C or higher analytical laboratory data packages. The analytical results and Data Packages 1 through 6 were submitted to the SNL/NM CFRC for retention.

1.3.1.6 Waste Management

The waste generated by the sampling activities was managed in accordance with the applicable waste management procedure. The purge and decontamination wastewater was containerized and stored in the hazardous waste central accumulation area at Building 9925. It was discharged to the sanitary sewer in accordance with ABCWUA and project-specific regulatory requirements after the waste characterization data were compared to the ABCWUA discharge limits and a discharge approval was issued in accordance with corporate policy.

1.3.2 Analytical Methods

Tables 1-5 and 1-6 list the EPA and DOE-specified methods and protocols used to analyze the groundwater samples.

The analytical laboratory establishes the method detection limits (MDLs) and practical quantitation limits (PQLs) for each analytical method, matrix (groundwater), and analyte. Analytes with results above the MDL are reported as detected by the laboratory. Analytes with results below the MDL are reported as not detected by the laboratory. Results that were qualified by the laboratory and/or during data validation are discussed in Chapters 2.0 through 7.0. MDLs, PQLs, laboratory qualifiers, and validation qualifiers are included in the site-specific analytical results tables.

Nitrate concentrations were measured by a nitrate plus nitrite (NPN) as nitrogen analytical method. Historical SNL/NM groundwater analyses have demonstrated that nitrite concentrations are below the MDL and do not contribute to the results of NPN analyses. Therefore, NPN results in this Report represent nitrate concentrations, which are also referred to as NPN concentrations.

Table 1-5
Chemical Analytical Methods

Analyte	Analytical Method[a]
Alkalinity (total, bicarbonate, and carbonate)	SM 2320B
Anions	SW846-9056A
Filtered Metals (including cations)	SW846-6020B/7470A
HE Compounds	SW846-8330B
Mercury	SW846-7470A
NPN	EPA 353.2
Perchlorate	SW846-6850M
TAL Metals plus Uranium	SW846-6020B/7470A
Total Cyanide	SW846-9012B
Total Organic Halogens	SW846-9020B
TPH Diesel Range Organics	SW846-8015D
TPH Gasoline Range Organics	SW846-8015D GRO
Total Phenols	SW846-9066
VOCs	SW846-8260D

Notes:

[a] **Analytical Method References**

Rice, E.W.,Baird, R.B., Eaton, A.D., and Clesceri. L.S. (2012). *Standard Methods for the Examination of Water and Wastewater*, 23rd ed. American Public Health Association, American Water Works Association, and Water Environment Federation.

U.S. Environmental Protection Agency. (1984). *Methods for Chemical Analysis of Water and Wastes,* EPA 600-4-79-020.

U.S. Environmental Protection Agency. (1986b, as updated). *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, 3rd ed., Rev. 1.

EPA = U.S. Environmental Protection Agency
GRO = Gasoline Range Organics
HE = high explosive
NPN = nitrate plus nitrite
SM = Standard Method
SW = Solid Waste
TAL = Target Analyte List
TPH = total petroleum hydrocarbons
VOC = volatile organic compound

Table 1-6
Radiochemical Analytical Methods

Analyte	Analytical Method[a]
Gamma Spectroscopy (short list[b])	EPA 901.1
Gross Alpha/Beta Activity	EPA 901.0
Isotopic Uranium	HASL-300
Radon-222	SM7500 Rn B
Radium-226	EPA 903.1M
Radium-228	EPA 904.0
Tritium	EPA 906.0M

Notes:

[a] **Analytical Method References**

Rice, E.W., Baird, R.B., Eaton, A.D., and Clesceri, L.S. (2012). *Standard Methods for the Examination of Water and Wastewater*, 23rd ed. American Public Health Association, American Water Works Association, and Water Environment Federation.

U.S. Department of Energy. (1997). *EML Procedures Manual,* 28th ed., Vol. 1, Rev. 0, HASL-300.

U.S. Environmental Protection Agency. (1980). *Prescribed Procedures for Measurement of Radioactivity in Drinking Water*, EPA-600/4-80-032.

[b] Gamma spectroscopy short list (americium-241, cesium-137, cobalt-60, and potassium-40)

EPA = U.S. Environmental Protection Agency
HASL = Health and Safety Laboratory
SM = Standard Method

1.3.3 Quality Control Samples

Field and laboratory QC samples were prepared and analyzed along with the groundwater samples to determine the accuracy and precision of the analytical methods and to detect inadvertent sample contamination that may have occurred during the sampling and analysis process. Table 1-7 lists the types of QC samples that accompanied the groundwater samples in the sampling and analysis process.

Upon receipt at SNL/NM, the analytical results were reviewed and qualified in accordance with the applicable data validation procedure. An independent third-party subcontractor performed the data validation. The analytical results (Chapter 2.0 through Chapter 7.0 attachments) include the validation qualifiers. The data validation reports (Data Packages 1 through 6) were submitted to the SNL/NM CFRC for retention.

1.3.4 Field Quality Control Samples

The field QC samples included environmental duplicate, equipment blank, field blank, and trip blank samples.

1.3.4.1 Environmental Duplicate Samples

Environmental duplicate samples were collected to document the precision of the sampling and analysis process. The duplicate sample was collected immediately after the original environmental sample to reduce variability caused by time and/or sampling mechanics. Relative percent differences (RPDs) were calculated for the analytes detected in both the duplicate and original samples.

Chapters 2.0 through 7.0 summarize the CY 2024 environmental duplicate sample results and RPDs.

Table 1-7
Quality Control Sample Types for Groundwater Sampling and Analysis

QC Sample Type	Purpose
Field QC	
Environmental duplicate samples	Document the precision of the sampling and analysis process.
Equipment blanks	Verify sampling pump and tubing bundle decontamination to ensure that cross-contamination between monitoring wells did not occur.
Field blanks	Determine whether VOC, DRO, or GRO contamination from ambient field conditions occurred.
Trip blanks	Determine whether VOC, DRO, or GRO contamination occurred during sample collection, handling, shipment, storage, or analysis.
Laboratory QC	
Batch matrix spike and matrix spike duplicate samples	Measure the percent recovery and RPD of chemical spikes added to an existing sample to determine the sample matrix effect. The matrix is groundwater.
Laboratory control samples	Monitor the accuracy and precision of the analytical method using laboratory-prepared samples spiked with a known concentration of an analyte. These samples and the groundwater samples are analyzed in the same batch. LCS results are reported as a percent recovery.
Method blanks	Determine whether contaminants were inadvertently introduced during the sample preparation and handling process in the analytical laboratory.
Sample replicate	Determine the precision of non-organic analyses.
Surrogate spike	Demonstrate matrix compatibility with the chosen method of organic compound analysis.

Notes:
DRO = diesel range organics
GRO = gasoline range organics
QC = quality control
RPD = relative percent difference
VOC = volatile organic compound

1.3.4.2 Equipment Blank Samples

Equipment blank samples were collected periodically to verify sampling pump and tubing bundle decontamination (Section 1.3.1.3).

Chapters 2.0 through 7.0 summarize the CY 2024 equipment blank sample results.

1.3.4.3 Field Blank Samples

Field blank samples were collected to determine whether sample contamination from ambient field conditions occurred. They were prepared by pouring deionized water into sample containers at the sampling point (inside the sampling truck at each monitoring well location) to simulate the transfer of groundwater from the sampling system to the sample containers.

Field blank samples are contained in 40-ml glass vials and are commonly analyzed for volatile organic compounds (VOCs), diesel range organics (DRO), and/or gasoline range organics (GRO).

Additionally, field blank samples were collected from the deionized water used for decontamination and equipment blank sample collection. The field blank sample results were used to internally verify the quality of the deionized water.

Chapters 2.0 through 7.0 summarize the CY 2024 field blank sample results.

1.3.4.4 Trip Blank Samples

Trip blank samples were submitted to determine whether sample contamination occurred during sample collection, transport, storage, or analysis.

Trip blank samples are submitted whenever groundwater samples are submitted for VOC, DRO, and/or GRO analyses. They consist of laboratory reagent-grade water with hydrochloric acid preservative contained in 40-ml glass vials. They are prepared by the analytical laboratory and accompany the laboratory-supplied sample containers to the field and back.

Chapters 2.0 through 7.0 summarize the CY 2024 trip blank sample results.

1.3.5 Laboratory Quality Control Samples

Laboratory QC samples were prepared to determine whether sample contamination from laboratory processes occurred. They were used to assist with data validation and defensibility and included laboratory control, method blank, matrix spike and matrix spike duplicate, surrogate spike, and replicate samples. They were analyzed concurrently with the groundwater and field QC samples in accordance with laboratory procedures and EPA methods.

Upon receipt at SNL/NM, the analytical results were reviewed and qualified. The analytical results (Chapter 2.0 through 7.0 attachments) include the laboratory qualifiers.

Chapter 1.0
Introduction References

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2.0 Groundwater Monitoring Program

2.1 Introduction

This chapter summarizes the calendar year (CY) 2024 Groundwater Monitoring Program (GMP) groundwater monitoring activities and results. The activities included groundwater and surface water sampling, sample analysis, and water level measurements.

The GMP collects and evaluates groundwater and surface water samples from the GMP monitoring well network and manages the comprehensive groundwater elevation monitoring at Sandia National Laboratories, New Mexico (SNL/NM). Additionally, the GMP manages site-wide monitoring well information, overseeing SNL/NM databases and records that include well construction details, permits, and registry information. Table 1 provides an example of such information.

The GMP monitoring well network was instituted in the 1990s. Over the years, the network has expanded, reaching a total of 16 monitoring wells and one spring by 2019 (Figure 2-1). The last expansion in 2019 added four new monitoring wells (CCBA-MW2, CTF MW1, CYN-MW5, and OBS-MW1) that were part of investigations related to Solid Waste Management Units ultimately granted Corrective Action Complete status. These four monitoring wells facilitate long-term monitoring of the fractured bedrock aquifer system within the general hydrogeologic system at SNL/NM. The lithology of the screened interval of all the monitoring wells in the network is included on Table 1.

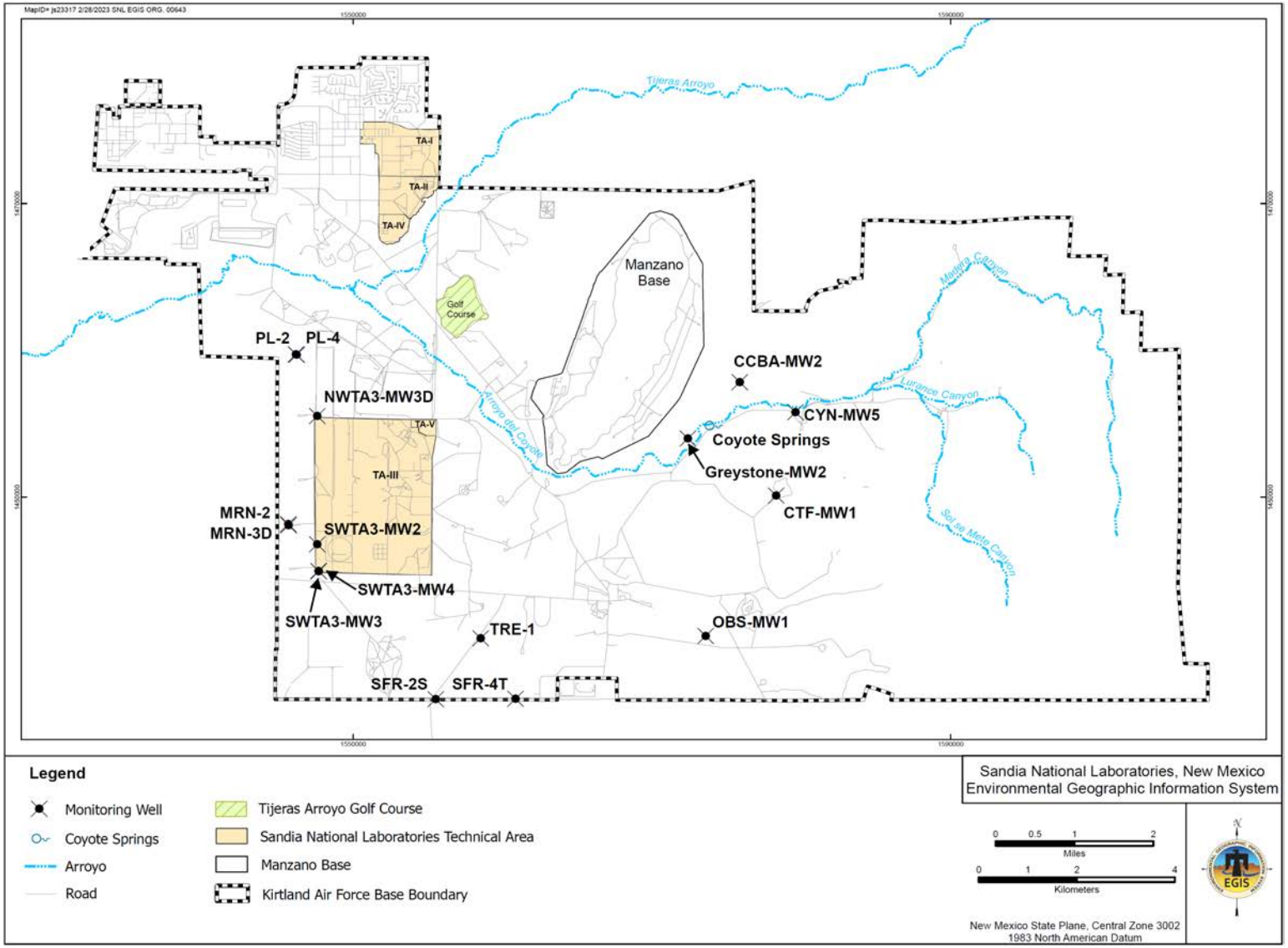


Figure 2-1
Groundwater Monitoring Program Monitoring Well Network

2.2 Regulatory Requirements

Site-wide groundwater monitoring through the GMP is subject to the *Compliance Order on Consent Pursuant to the New Mexico Hazardous Waste Act 74-4-10: Sandia National Laboratories Consent Order* (Consent Order) (NMED, April 2004) and the comprehensive site-wide groundwater monitoring plan submitted to the New Mexico Environment Department (NMED) annually.

2.3 Scope of Activities

CY 2024 GMP groundwater monitoring activities included:

- Annual collection and analysis of groundwater samples from 16 GMP monitoring wells and a surface water sample from Coyote Springs (Figure 2-1) in April/May 2024.
- Quarterly water level measurements and groundwater elevation calculations for 105 SNL/NM (U.S. Department of Energy National Nuclear Security Administration [DOE/NNSA]-owned) monitoring wells and 1 City of Albuquerque (COA) monitoring well.
- Preparation of analytical results tables (Attachment 2A), hydrographs (Attachment 2B), and the site-wide potentiometric surface map (Plate 1).
- Submittal of the *Comprehensive Site-Wide Groundwater Monitoring Plan, Calendar Year 2025* (SNL/NM, April 2024) to the NMED.

2.3.1 Groundwater Monitoring

The annual sampling event was conducted during the period of April 10 to May 22, 2024. Groundwater samples were collected from 16 GMP monitoring wells (CCBA-MW2, CTF-MW1, CYN-MW5, Greystone-MW2, MRN-2, MRN-3D, NWTA3-MW3D, OBS-MW1, PL-2, PL-4, SFR-2S, SFR-4T, SWTA3-MW2, SWTA3-MW3, SWTA3-MW4, and TRE-1) with a submersible piston pump. A surface water sample was collected from Coyote Springs with a portable peristaltic pump. The samples were analyzed for:

- The Safe Drinking Water Act list of volatile organic compounds (VOCs).
- High explosive (HE) compounds (select monitoring wells only).
- Nitrate plus nitrite (NPN).
- Alkalinity, major anions (chloride, bromide, fluoride, and sulfate), total organic halogens (TOX), total phenol, and total cyanide.
- Mercury.
- Target Analyte List (TAL) metals (all monitoring wells) plus total uranium (select monitoring wells only).
- Gamma spectroscopy short list (americium-241, cesium-137, cobalt-60, and potassium-40), gross alpha/beta activity, isotopic uranium (uranium-233/234, uranium-235/236, and uranium-238) (select monitoring wells only), radium-226, and radium-228.

Excluding those for VOCs, HE compounds, and total mercury fractions, the samples were filtered at the sampling locations with 0.45-µm inline filters. Mercury was analyzed for both dissolved (filtered) and total (unfiltered) fractions. The samples collected from six monitoring wells located downgradient of the Coyote Canyon Test Field and the Dynamic Explosives Test Site (SFR-2S, SFR-4T, SWTA3-MW2, SWTA3-MW3, SWTA3-MW4, and TRE-1) were analyzed for HE compounds. The samples collected from Coyote Springs and eight monitoring wells (CCBA-MW2, CTF-MW1, CYN-MW5,

Greystone-MW2, OBS-MW1, SFR-2S, SFR-4T, and TRE-1) were analyzed for isotopic uranium. The samples collected from seven monitoring wells (MRN-3D, NWTA3-MW3D, PL-2, PL-4, SWTA3-MW2, SWTA3-MW3, and SWTA3-MW4) were analyzed for total uranium.

The water levels at 105 SNL/NM monitoring wells were measured quarterly and used to determine groundwater elevations. The groundwater elevation data for the 105 SNL/NM monitoring wells, along with groundwater elevation data obtained from the KAFB Environmental Restoration Program, COA Environmental Health Department, and U.S. Geological Survey (Table 2), were used to construct the site-wide potentiometric surface map of the Regional Aquifer and fractured bedrock aquifer system (Plate 1). Overall, the contours display a pattern that reflects the impact of groundwater withdrawal by production wells located in the northwestern part of KAFB and adjacent parts of Albuquerque. The primary factors that influence groundwater elevation fluctuations site wide are groundwater recharge in the mountains and along arroyos. The primary source of groundwater recharge is precipitation. The primary source of groundwater withdrawal is pumping by KAFB, Albuquerque Bernalillo County Water Utility Authority (ABCWUA), and Veterans Affairs production wells. Precipitation and groundwater production data were collected to determine the impact of groundwater recharge and withdrawal on groundwater elevations.

2.3.2 Monitoring Well Installation

No new monitoring wells were installed or added to the GMP monitoring well network in CY 2024.

2.4 Field Procedures and Measurements

Chapter 1.0, Section 1.3 describes how the CY 2024 GMP groundwater data were collected and analyzed.

2.5 Analytical Methods

The analytical laboratory analyzed the groundwater and surface water samples using the applicable U.S. Environmental Protection Agency (EPA) and DOE-specified methods and protocols identified in Chapter 1.0, Section 1.3.2 (Tables 1-5 and 1-6).

Nitrate concentrations were measured by an NPN as nitrogen analytical method. Historical GMP groundwater analyses have demonstrated that nitrite concentrations are below the method detection limit (MDL) and do not contribute to the results of NPN analyses. Therefore, NPN results in this chapter and its attachments represent nitrate concentrations, which are also referred to as NPN concentrations.

2.6 Summary of Calendar Year 2024 Groundwater Monitoring Results

The following sections summarize the CY 2024 GMP groundwater monitoring results. Attachment 2A (Tables 2A-1 through 2A-8) presents the analytical results and field water quality parameter measurements for the annual sampling event. The analytical results were reviewed and qualified during data validation and include the laboratory and validation qualifiers. Attachment 2B (Figures 2B-1 through 2B-15) presents the GMP hydrographs, which include monitoring well hydrographs, precipitation data, and production well data. Attachment 2C (Figures 2C-1 through 2C-4) presents concentration trend plots for monitoring locations where analyte concentrations exceeded the U.S. Environmental Protection Agency maximum contaminant levels (EPA MCLs) (EPA, March 2018) and/or the New Mexico Water Quality Control Commission maximum allowable concentrations (MACs) (NMWQCC, December 2018).

2.6.1 Analytical Results

The analytical results are compared to the EPA MCLs and MACs, where established. The analytical results and analytical laboratory data packages (Data Package 1) were submitted to the SNL/NM Customer Funded Records Center for retention and are archived in the SNL/NM Environmental Data Management System.

Table 2A-1 presents the VOC and HE compound results; Table 2A-2 lists the corresponding MDLs. No HE compounds were detected. Except for chloroform, toluene, and methylene chloride, no VOCs were detected. Chloroform was reported for monitoring well TRE-1 at a concentration of 0.820 μg/L, which is below the EPA MCL and MAC for total trihalomethane compounds (which include chloroform) of 80.0 μg/L and 100 μg/L, respectively. Toluene was reported for monitoring well SWTA3-MW3 at a concentration of 0.400 μg/L, which is below the EPA MCL and MAC of 1,000 μg/L. Methylene chloride was detected in 18 environmental and environmental duplicate samples but was qualified during data validation as not detected at the practical quantitation limit (PQL) because the results were below the PQL in the environmental or associated method blank or trip blank samples.

Table 2A-3 presents the NPN results. NPN was detected in all water samples, with concentrations ranging from 0.241 mg/L to 8.15 mg/L. These results are below the EPA MCL and MAC of 10 mg/L.

Table 2A-4 presents the alkalinity, major anion, TOX, total phenol, and total cyanide results. Only fluoride and sulfate were detected at concentrations exceeding the EPA MCLs or MACs. Fluoride exceeded the MAC of 1.6 mg/L at monitoring wells OBS-MW1, SFR-2S, and SWTA3-MW4, with concentrations ranging from 1.62 mg/L to 2.08 mg/L. These results are below the EPA MCL of 4.0 mg/L, and the fluoride is considered to be naturally occurring. Figures 2C-1 through 2C-3 present the fluoride concentration trend plots for OBS-MW1, SFR-2S, and SWTA3-MW4. Sulfate exceeded the MAC of 600 mg/L at monitoring well SFR-4T, with a concentration of 2,100 mg/L. The sulfate is likely naturally occurring. The alkalinity, major anion, TOX, and total phenol results are consistent with historical results. TOX in the CTF-MW1 environmental and environmental duplicate samples was qualified during data validation as not detected at the PQL because the results were below the PQL in the environmental and associated equipment blank samples. The total cyanide results for 21 samples and total phenol results for 9 samples were qualified during data validation as not usable because the concentration intercept was negative, with an absolute value greater than three times the MDL for both total cyanide and total phenols.

Table 2A-5 presents the mercury results. Mercury was detected in the SWTA3-MW2 environmental sample at a concentration of 0.000141 mg/L, which is below the EPA MCL and MAC of 0.002 mg/L. Mercury was not detected in any other samples.

Table 2A-6 presents the TAL metals and total uranium results. Except for beryllium, no metals were detected at concentrations exceeding the EPA MCLs or MACs. Beryllium exceeded the EPA MCL and MAC of 0.004 mg/L in the Coyote Springs surface water sample at a concentration of 0.00718 mg/L. The beryllium is considered to be naturally occurring, and as the beryllium concentration trend plot for Coyote Springs (Attachment 2C, Figure 2C-4) demonstrates, this result is consistent with historical results.

Table 2A-7 presents the gamma spectroscopy short list, gross alpha/beta activity, isotopic uranium, radium-226, and radium-228 results. The results are below the EPA MCLs and MACs, where established.

Isotopic uranium analyses were performed for Coyote Springs, as well as monitoring wells CCBA-MW2, CTF-MW1, CYN- MW5, Greystone-MW2, OBS-MW1, SFR-2S, SFR-4T, and TRE-1, which previously had high gross alpha activity or are located where the groundwater contacts bedrock that contains minerals high in naturally occurring radioisotopes. Neither EPA MCLs nor MACs have been established for isotopic uranium.

Gross alpha activity was measured in accordance with 40 CFR Part 141 and used as a radiological screening tool. Naturally occurring uranium was measured independently (total uranium concentration determined by metals analysis described above), and the gross alpha activity measurements were corrected by subtracting the total uranium activity from the uncorrected gross alpha activity results. An SNL/NM health physicist reviewed the results to screen for radiological anomalies and to verify that levels were within acceptable limits. The corrected gross alpha activity results were below the EPA MCL of 15 pCi/L. The gross beta activity results were used as a radiological screening tool and did not indicate the presence of a beta-emitting radionuclide that would exceed the EPA MCL of 4 mrem/yr. There were no indications of radiological contamination in any samples.

Table 2A-8 presents the field water quality parameter measurements obtained at the end of purging and before sample collection (Chapter 1.0, Section 1.3.1.2) at each monitoring well and at Coyote Springs. The field water quality parameters measured consisted of dissolved oxygen, oxidation-reduction potential, potential of hydrogen, specific conductivity, temperature, and turbidity. These parameters were measured to evaluate water chemistry stability and ensure the collection of representative groundwater and surface water samples.

2.6.2 Water Level Measurements

The water levels at 105 SNL/NM monitoring wells were measured quarterly and used to determine groundwater elevations. The groundwater elevation data for the 105 SNL/NM monitoring wells, as well as 83 additional monitoring wells owned by other agencies (Table 2), were used to construct Plate 1. The groundwater elevations for the 188 monitoring wells are plotted on Plate 1.

Table 2-1 lists the total number of monitoring wells at which water levels were measured. Table 2 presents the groundwater elevation data used to construct Plate 1.

Table 2-1
Water Levels Measured by Sandia National Laboratories, New Mexico and Other Agencies in Calendar Year 2024

Total Wells	Measuring Agency	Well Owner	Location
105	SNL/NM	DOE/NNSA	SNL/NM monitoring wells (GMP, CWL, MWL, TAVG, TAG, BSG)
75	KAFB	KAFB	ERP Long-term Monitoring Program
5	COA EHD	COA	Eubank Landfill north of KAFB and Yale Landfill west of KAFB
1	SNL/NM	COA	Eubank-1, west of Eubank Landfill
1	USGS	NMOSE	Mesa Del Sol-S well
1	USGS	COA	Montessa Park-S well

Notes:
BSG = Burn Site Groundwater
COA = City of Albuquerque
CWL = Chemical Waste Landfill
DOE/NNSA = U.S. Department of Energy National Nuclear Security Administration
EHD = Environmental Health Department
ERP = Environmental Restoration Program
GMP = Groundwater Monitoring Program
KAFB = Kirtland Air Force Base
MWL = Mixed Waste Landfill
NMOSE = New Mexico Office of the State Engineer
NNSA = National Nuclear Security Administration
SNL/NM = Sandia National Laboratories, New Mexico
TAG = Tijeras Arroyo Groundwater
TAVG = Technical Area-V Groundwater
USGS = U.S. Geological Survey

2.6.2.1 Groundwater Recharge and Withdrawal

The primary factors that influence groundwater elevation fluctuations site wide are groundwater recharge from precipitation and groundwater withdrawal by production wells.

Annual Precipitation

The Albuquerque Basin climate is semiarid. Long-term average precipitation ranges from 8.84 in. per year (30-year norm based on 1991-2020 data) at the Albuquerque International Sunport to 35 in. per year at Sandia Crest, located approximately 12 mi northeast of SNL/NM Technical Area (TA)-I. In an average year, New Mexico receives most of its precipitation between July and September due to the North American Monsoon. This precipitation comes in the form of brief heavy rain. In CY 2024, the wettest months were June, July, August, and November.

Precipitation data relevant to the KAFB hydrogeologic setting were collected from five rain gauges. The following five meteorological towers (four managed by SNL/NM and one managed by the National Weather Service) were used to evaluate the precipitation pattern for KAFB:

- A21 tower located in TA-II (Figure 1-4).
- A36 tower located in TA-III/V (Figure 1-4).
- LC1 tower located in Lurance Canyon, west of the Burn Site (Figure 1-4). This location was established in 2019; therefore, no annual data from years prior to 2020 are available.
- SC1 tower located near the Schoolhouse Well in the Manzanita Mountain foothills (Figure 1-4).
- National Weather Service meteorological station KABQ, located at the Albuquerque International Sunport, northwest corner of KAFB (Figure 1-4).

Table 2-2 presents the CY 2024 precipitation data, along with the CY 2023 precipitation data for comparison. The difference in precipitation totals for the five locations shows the isolated nature of rain and snow in the Albuquerque area. The 6.96 in. of precipitation measured at KABQ in CY 2024 are substantially more than the 5.77 in. measured the prior year and are 1.88 in. below the 30-year (1991-2020) norm of 8.84 in. Figure 2B-11 shows the CY 2024 monthly distribution of precipitation at the five locations, along with the 30-year average at KABQ. Figure 2B-12 shows the annual distribution of precipitation at four locations (A21, A36, SC1, and KABQ) for the last 10 years (CY 2015 through CY 2024).

Table 2-2
Precipitation Data for Kirtland Air Force Base, Calendar Years 2023 and 2024

Year	Meteorological Station				
	A21	A36	LC1	SC1	KABQ
CY 2023	6.62	6.45	9.23	7.64	5.77
CY 2024	9.42	6.21	10.32	7.19	6.96

Notes:
Data are in inches of rainfall.
A21 = SNL/NM meteorological station in Technical Area-II
A36 = SNL/NM meteorological station in Technical Area-III/V
CY = calendar year
KABQ = National Weather Service meteorological station at the Albuquerque International Sunport
LC1 = SNL/NM meteorological station in Lurance Canyon, west of the Burn Site, installed in 2019
SC1 = SNL/NM meteorological station in the Manzanita Mountain Foothills
SNL/NM = Sandia National Laboratories, New Mexico

Groundwater Withdrawal

The KAFB production wells are screened over a depth of approximately 500 to 2,000 ft bgs and extract groundwater from the Regional Aquifer in the upper and middle unit of the Santa Fe Group (SFG). During CY 2024, KAFB pumped groundwater for potable use primarily from three production wells (KAFB-4, KAFB-14, and KAFB-20) (Figure 2B-14).

KAFB supplies the potable water for SNL/NM and other DOE/NNSA facilities located on KAFB. Figure 2B-13 shows the CY 2024 monthly totals for the KAFB production wells. The highest production occurred in June 2024 at 102 million gal; the lowest production occurred in December 2024 at 36 million gal. The variability in production is in response to seasonal demand, as reflected in the cyclic fluctuation of the groundwater elevations at some monitoring wells, and is evident on the corresponding hydrographs (Section 2.6.2.2). Figure 2B-14 shows the CY 2024 monthly production for each KAFB production well. Figure 2B-15 shows the trend of total annual groundwater production at KAFB since 2014. Table 2-3 compares the CY 2024 production to the prior year.

Table 2-3
Total Kirtland Air Force Base Groundwater Production, Calendar Years 2023 and 2024

Units	CY 2023	CY 2024
Million gal	837	792
Acre-feet	2,569	2,429

Notes:
acre-feet = 325,851 gal
CY = calendar year
gal = gallons

2.6.2.2 Groundwater Elevations

Groundwater elevation data were used to construct the following potentiometric surface maps and hydrographs.

Site-Wide Potentiometric Surface Map

The groundwater elevation data from Table 2 were used to construct the CY 2024 site-wide potentiometric surface map of the Regional Aquifer and fractured bedrock aquifer system (Plate 1). Water level measurements from February, March, May, June, September, October, and December 2024 were used to interpret the groundwater elevation data and construct the contours. Even though the various well owners (DOE/NNSA, KAFB, COA, and New Mexico Office of the State Engineer) measure water levels on differing schedules throughout the year, the use of several months of data is considered temporally concordant because the water levels at the monitoring wells across KAFB are typically not seasonally affected.

Plate 1 represents the potentiometric surface of the Regional Aquifer and incorporates monitoring wells completed at the water table west of the Tijeras Fault Zone and in the fractured bedrock aquifer system east of the fault zone (Figure 1-3). West of the Tijeras Fault Zone, the Regional Aquifer is under unconfined (water table) to semiconfined conditions and is present within the SFG, which consists of fine-grained alluvial-fan lithofacies and the coarser-grained ancestral Rio Grande (ARG) lithofacies (Figure 1-3). Within and east of the Tijeras Fault Zone, the Regional Aquifer is typically under confined conditions (positive pressure head [upward vertical gradient]) and is primarily present within fractured Paleozoic bedrock (primarily limestone and sandstone) and Precambrian bedrock (primarily granite and metamorphic rocks). The fault zone partially restricts groundwater underflow from the bedrock recharging the unconsolidated basin-fill deposits (the SFG) of the Albuquerque Basin.

In general, groundwater flows westward from the Manzanita Mountains toward the Rio Grande. An extensive north-south trending trough is present in the water table along the western edge of KAFB due to cumulative drawdown caused by production wells near the western and northern boundaries of KAFB. As a result, groundwater elevations across much of KAFB declined steadily until 2008. Since 2008, hydrographs for Regional Aquifer wells in the northern part of KAFB have shown an increasing trend in groundwater elevations. Presumably, this is in response to the ABCWUA transitioning to surface water withdrawals from the Rio Grande for potable water supplies and decreasing dependence on ABCWUA production wells. The water table trough extends as far south as the Pueblo of Isleta. The flat gradient in the middle of the trough indicates flow through the highly permeable sediments of the ARG fluvial deposits, which are the most productive aquifer material in the Albuquerque Basin.

Relatively steeper gradients in the eastern part of KAFB are due to less permeable materials in the fractured bedrock aquifer system, higher ground surface elevations along the eastern mountain front of the Albuquerque Basin, and the presence of several basin-bounding faults.

Perched Groundwater System Potentiometric Surface Map

During the 1993 installation of monitoring wells in TA-II, a shallow water-bearing zone (subsequently referred to as the PGWS) was encountered at a depth of 300 ft bgs. This was 200 ft above the Regional Aquifer. The installation of additional monitoring wells defined the lateral extent of the PGWS, which covers approximately 4.43 mi^2 (SNL/NM, February 2018). As the potentiometric surface map of the PGWS (Figure 6-4) illustrates, the PGWS extends beyond the boundary of the TAG AOC. The western edge of the PGWS coincides with the former KAFB sewage lagoons. The northern edge of the PGWS coincides with the northern boundary of TA-I and the KAFB parade grounds. The eastern edge of the PGWS coincides with the western boundary of active KAFB landfill LF-268. The southern tip of the PGWS coincides with the southern edge of the Tijeras Arroyo Golf Course. The PGWS merges with the Regional Aquifer along Powerline Road.

Groundwater Monitoring Program Monitoring Well Hydrographs

This section summarizes historical and recent trends in groundwater elevations in the vicinity of SNL/NM, as demonstrated on the hydrographs for the 16 GMP monitoring wells (Attachment 2B). Historical groundwater elevation data through CY 2024 were used to plot the hydrographs. Except for Greystone-MW2, the groundwater elevation data for these monitoring wells are representative of the groundwater in the Regional Aquifer and fractured bedrock aquifer system. Specific information gleaned from the hydrographs includes the following:

- Greystone-MW2 (Figure 2B-1): Declining trend of approximately 0.25 ft/yr with superimposed seasonal effects of 1 to 2 ft that have a maximum water table elevation in the spring. This monitoring well is located in Lurance Canyon and has a shallow screen set in unconsolidated alluvium. There are no production wells in the area; however, this monitoring well is located 1,600 ft downgradient of the heavily vegetated Coyote Springs, and the seasonal effects may reflect evapotranspiration impacts from the cottonwood trees at the springs.
- MRN-2 and MRN-3D (Figure 2B-2): Declining trend until early 2011; groundwater elevations stabilized between 2011 and 2014; increasing trend of approximately 0.5 ft/yr from 2014 to 2020; stable to slightly increasing trend since 2020.
- NWTA3-MW3D, PL-2, and PL-4 (Figure 2B-3): Declining trend until late 2010/early 2011; groundwater elevations stabilized between 2011 and 2014; increasing trend of approximately 1 ft/yr from 2014 to 2020; stable to slightly increasing trend since 2020.
- SFR-2S and TRE-1 (Figure 2B-4): Slightly declining trend of approximately 0.15 to 0.25 ft/yr since 2004.
- SFR-4T (Figure 2B-5): Cyclical pattern with artificial yearly fluctuations of 20 to 30 ft since 2001; yearly minimums are associated with SNL/NM groundwater sampling events and subsequent three to nine months of water level recovery; declining trend of peaks of approximately 0.25 ft/yr.
- SWTA3-MW2, SWTA3-MW3, and SWTA3-MW4 (Figure 2B-6): Moderately declining trend until late 2011; groundwater elevations stabilized between late 2011 and 2014; increasing trend of approximately 0.6 ft/yr since 2014.
- OBS-MW1 (Figure 2B-7): Stable groundwater elevations since 2011.
- CCBA-MW2 (Figure 2B-8): Slightly declining trend of approximately 0.14 ft/yr since 2011.
- CTF-MW1 (Figure 2B-9): Slightly declining trend of approximately 0.31 ft/yr over the life of this monitoring well.
- CYN-MW5 (Figure 2B-10): Slightly declining trend of approximately 0.14 ft/yr over the life of this monitoring well.

Site-Wide Map with Hydrographs for Select Monitoring Wells

This section addresses the spatial differences in hydrologic conditions in monitoring wells completed in the Regional Aquifer and fractured bedrock aquifer system. Figure 2-2 is a site-wide map that shows geographic differences in groundwater elevations over time. The map does not show all the SNL/NM monitoring wells/hydrographs but rather representative examples based on their geographic distribution. All the hydrographs have the same vertical scale and horizontal scale. The well locations are generalized, and the depicted locations may represent one or more monitoring wells, depending on the specific hydrograph. For a site-wide map such as this, the emphasis is on the overall shape of the trend lines and, as such, it may be difficult to read the vertical or horizontal scales on the individual hydrographs. For

site-specific details, readers are referred to the site-specific hydrographs (Chapter 2.0 through 7.0 attachments).

Figure 2-2 superimposes a subset of the hydrographs over a base map of the fractured bedrock aquifer system and the lithofacies at the upper surface (water table) of the Regional Aquifer. Specific information gleaned from the hydrographs includes the following:

- The monitoring wells furthest east in the fractured bedrock aquifer system (e.g., CYN-MW4) exhibit the greatest variability, with notable responses to long-term precipitation trends and steeply declining groundwater elevations possibly due to long-term regional drought conditions.
- Other monitoring wells in the fractured bedrock aquifer system (e.g., CTF-MW1) exhibit less variability and only slightly to moderately declining groundwater elevations.
- The monitoring wells in the fine-grained alluvial-fan lithofacies of the Regional Aquifer (e.g., Chemical Waste Landfill monitoring wells) exhibit slightly to moderately declining groundwater elevations.
- The monitoring wells in the ARG lithofacies of the Regional Aquifer in the southwestern part of KAFB (e.g., SWTA3-series monitoring wells) exhibit moderately declining groundwater elevations until 2010 and then moderately increasing groundwater elevations.
- The monitoring wells in the coarser-grained lithofacies of the Regional Aquifer in the northwestern part of KAFB (e.g., TA1-W-05) exhibit slightly declining groundwater elevations until 2010 and then moderately increasing groundwater elevations with a strong overprinting of seasonal fluctuations from nearby production wells.

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Map ID = sc25126 03/10/2025 SNL EGIS 04643

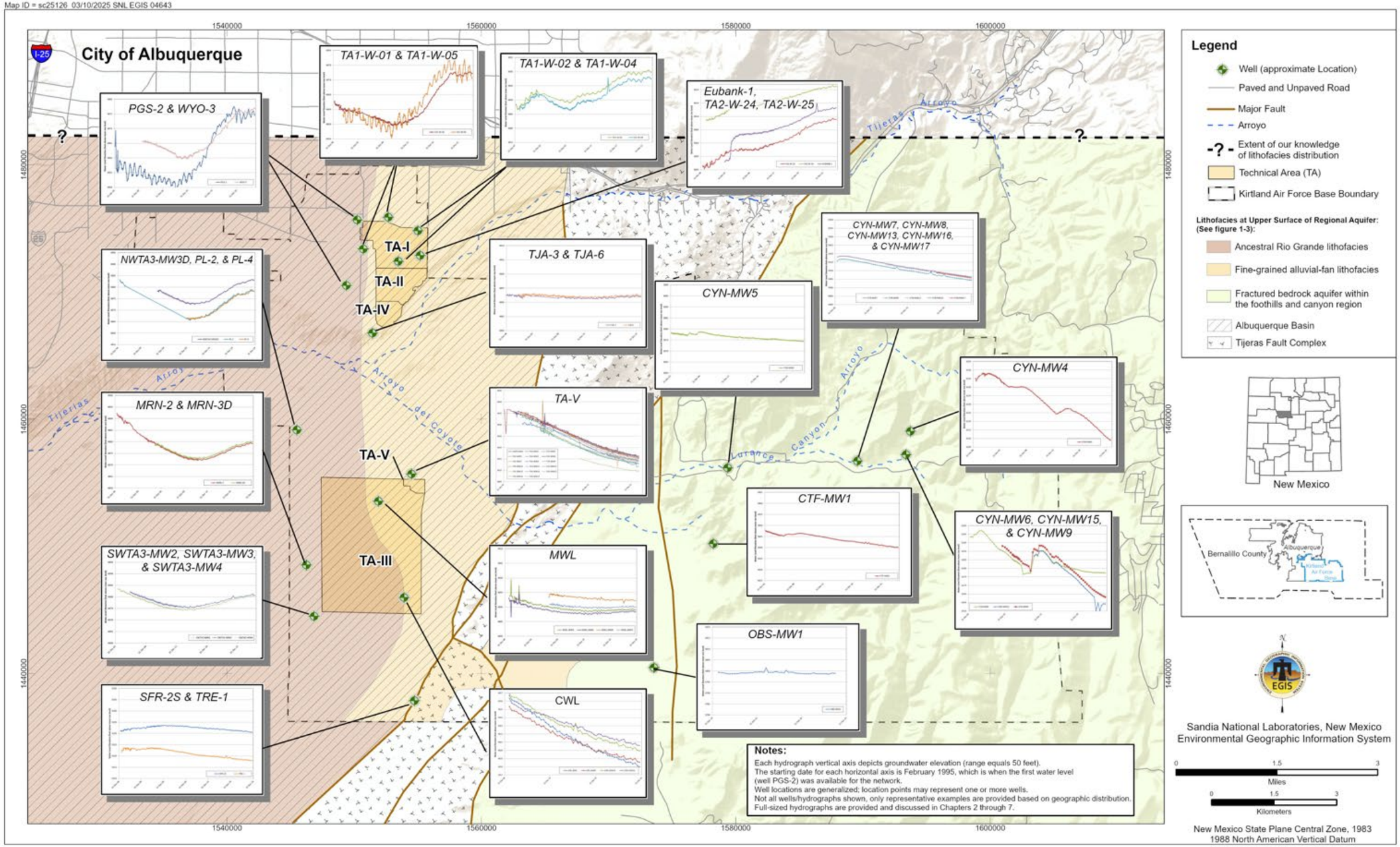


Figure 2-2
Geographic Distribution of Hydrographs for Monitoring Wells in the Regional Aquifer and Fractured Bedrock Aquifer System at Sandia National Laboratories, New Mexico (base map derived from Figure 1-3)

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2.7 Quality Control Results

The following sections summarize the CY 2024 field and laboratory QC sample results and their impact on data quality. Chapter 1.0, Section 1.3 describes how the field and laboratory QC samples were collected and prepared. Table 1-7 (Section 1.3.4) lists each field and laboratory QC sample type and purpose.

2.7.1 Field Quality Control Samples

The field QC samples included environmental duplicate, equipment blank, field blank, and trip blank samples.

Environmental duplicate samples were collected from monitoring wells CTF-MW1, NWTA3-MW3D, SFR-2S, and SWTA3-MW2 and were analyzed for all analytes (Section 2.3.1). Relative percent differences (RPDs) were calculated for the analytes detected in both the duplicate and original environmental samples. The sample pairs showed good agreement based on RPDs less than or equal to 35 for the analytes.

Equipment blank samples associated with monitoring wells CTF-MW1, NWTA3-MW3D, SFR-2S, and SWTA3-MW2 were collected before sampling of the wells began and were analyzed for all analytes (Section 2.3.1). Bromodichloromethane, bromoform, chloroform, chloride, copper, dibromochloromethane, methylene chloride, total phenols, sodium, sulfate, and TOX were detected in the equipment blank samples. No corrective action was necessary for bromodichloromethane, bromoform, chloroform, chloride, dibromochloromethane, total phenols, sodium, or sulfate because these analytes were either not detected in the associated environmental samples or were detected in such samples at concentrations greater than five times the equipment blank sample result. TOX in the CTF-MW1 environmental and environmental duplicate samples was qualified during data validation as not detected at the PQL because the results were below the PQL in the environmental and associated equipment blank samples. The TOX results for the SFR-2S and SWTA3-MW2 environmental samples were qualified during data validation as estimated values because they were greater than the PQL but less than five times the associated equipment blank sample result. The copper result for the SFR-2S environmental sample was qualified during data validation as an estimated value because it was greater than the PQL but less than five times the associated equipment blank sample result. Methylene chloride was qualified during data validation as not detected based on the associated method blank and trip blank sample results.

Four field blank samples were collected at monitoring wells CYN-MW5, OBS-MW1, SFR-4T, and SWTA3-MW3 and were analyzed for VOCs. Bromodichloromethane, chloroform, dibromochloromethane, and methylene chloride were detected in the field blank samples. No corrective action was necessary for bromodichloromethane, chloroform, or dibromochloromethane because these analytes were not detected in the associated environmental samples. Methylene chloride in the field blank samples was qualified during data validation as not detected due to the associated method blank sample results. One additional field blank sample was collected from the deionized water used for decontamination and equipment blank sample collection and was analyzed for all analytes (Section 2.3.1). The field blank sample results were used to internally verify the quality of the deionized water but were not used during data validation to qualify environmental or field QC sample results.

A total of 22 trip blank samples were submitted and analyzed for VOCs. Methylene chloride was detected at estimated concentrations (below the PQL) in 19 trip blank samples. Methylene chloride detected in the associated environmental samples at concentrations below the PQL was qualified during data validation as not detected.

2.7.2 Laboratory Quality Control Samples

The laboratory QC samples included laboratory control, method blank, matrix spike and matrix spike duplicate, surrogate spike, and replicate samples. They were analyzed concurrently with the groundwater and field QC samples in accordance with laboratory procedures and EPA methods. Although some results were qualified during data validation, the data were deemed acceptable, except for americium-241, total cyanide, and total phenols. The americium-241 activity for monitoring well SFR-4T was rejected due to the peak not meeting identification criteria. Also, the total cyanide results for 21 samples and total phenol results for 9 samples were qualified during data validation as not usable because the concentration intercept was negative, with an absolute value greater than three times the MDL for both total cyanide and total phenols.

2.8 Variances and Nonconformances

All CY 2024 GMP groundwater monitoring activities were performed and documented in accordance with the Consent Order and the *Comprehensive Site-Wide Groundwater Monitoring Plan (Revised), Calendar Year 2024* (SNL/NM, April 2023), with no variances or nonconformances identified.

2.9 Summary and Conclusions

The annual sampling event was conducted during the period of April 10 to May 22, 2024. Groundwater samples were collected from 16 GMP monitoring wells and a surface water sample was collected from Coyote Springs. The samples yielded analytical results consistent with historical results:

- No VOCs or HE compounds were detected at concentrations exceeding the EPA MCLs or MACs in any samples.
- NPN was detected in all water samples, with concentrations ranging from 0.241 mg/L to 8.15 mg/L. These results are below the EPA MCL and MAC of 10 mg/L.
- Fluoride exceeded the MAC of 1.6 mg/L at monitoring wells OBS-MW1, SFR-2S, and SWTA3-MW4, with concentrations ranging from 1.62 mg/L to 2.08 mg/L. These results are below the EPA MCL of 4.0 mg/L, and the fluoride is considered to be naturally occurring.
- Except for beryllium, no metals were detected at concentrations exceeding the EPA MCLs or MACs in any samples. Beryllium exceeded the EPA MCL and MAC of 0.004 mg/L in the Coyote Springs surface water sample at a concentration of 0.00718 mg/L. The beryllium is considered to be naturally occurring, and this result is consistent with historical results.

The water levels at 105 SNL/NM monitoring wells were measured quarterly and used to determine groundwater elevations. The groundwater elevation data for the 105 SNL/NM monitoring wells, as well as 83 additional monitoring wells owned by other agencies (Table 2), were used to construct the site-wide potentiometric surface map of the Regional Aquifer and fractured bedrock aquifer system (Plate 1). Overall, the contours display a pattern that reflects (1) the impact of groundwater withdrawal by production wells located in the northwestern part of KAFB and adjacent parts of Albuquerque and (2) the basin margin topography to the east. The groundwater elevations at monitoring wells over most of KAFB are declining due to regional drought conditions, whereas monitoring wells in the northwestern part of KAFB show aquifer recovery due to decreased pumping at production wells.

2.10 Summary of Future Activities

CY 2025 GMP groundwater monitoring activities will include:

- Annual collection and analysis of groundwater samples from 16 GMP monitoring wells (CCBA-MW2, CTF- MW1, CYN-MW5, Greystone-MW2, MRN-2, MRN-3D, NWTA3-MW3D, OBS-MW1, PL-2, PL-4, SFR-2S, SFR-4T, SWTA3-MW2, SWTA3-MW3, SWTA3-MW4, and TRE-1) and a surface water sample from Coyote Springs during the second quarter of CY 2025. The CY 2025 analytes will be the same as the CY 2024 analytes.
- Quarterly water level measurements and groundwater elevation calculations for 105 SNL/NM monitoring wells and 1 COA monitoring well.
- Annual reporting of the monitoring activities and results in the CY 2025 annual groundwater monitoring report.
- Submittal of the CY 2026 comprehensive site-wide groundwater monitoring plan to the NMED in April 2025

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Attachment 2A
Groundwater Monitoring Program Analytical Results Tables

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Attachment 2A Tables

Table 2A-1 Summary of Detected Volatile Organic Compounds and High Explosive Compounds, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 2A-5

Table 2A-2 Method Detection Limits for Volatile Organic Compounds and High Explosive Compounds, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 2A-6

Table 2A-3 Summary of Nitrate Plus Nitrite Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 2A-7

Table 2A-4 Summary of Alkalinity, Major Anion, Total Organic Halogen, Total Phenol, and Total Cyanide Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 2A-9

Table 2A-5 Summary of Mercury Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 2A-15

Table 2A-6 Summary of Target Analyte List Metals and Total Uranium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 2A-17

Table 2A-7 Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, Isotopic Uranium, and Radium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 2A-38

Table 2A-8 Summary of Field Water Quality Parameter Measurements, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 2A-45

Notes for Groundwater Monitoring Program Analytical Results Tables 2A-46

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Table 2A-1
Summary of Detected Volatile Organic Compounds and High Explosive Compounds, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (µg/L)	MDL[b] (µg/L)	PQL[c] (µg/L)	MCL / MAC[d] (µg/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
Coyote Springs 10-Apr-24	Methylene Chloride	2.20	0.500	5.00	5.00	5.00	B, J	5.00UJ	122324-001	SW846-8260D
CCBA-MW2 02-May-24	Methylene Chloride	0.850	0.500	5.00	5.00	5.00	B, J	5.00UJ	122388-001	SW846-8260D
CTF-MW1 06-May-24	Methylene Chloride	1.58	0.500	5.00	5.00	5.00	J	5.00UJ	122396-001	SW846-8260D
CTF-MW1 (Duplicate) 06-May-24	Methylene Chloride	1.76	0.500	5.00	5.00	5.00	J	5.00UJ	122397-001	SW846-8260D
CYN-MW5 07-May-24	Methylene Chloride	1.57	0.500	5.00	5.00	5.00	J	5.00UJ	122405-001	SW846-8260D
MRN-2 22-Apr-24	Methylene Chloride	0.870	0.500	5.00	5.00	5.00	J	5.00UJ	122357-001	SW846-8260D
MRN-3D 23-Apr-24	Methylene Chloride	0.810	0.500	5.00	5.00	5.00	J	5.00UJ	122359-001	SW846-8260D
NWTA3-MW3D 18-Apr-24	Methylene Chloride	1.24	0.500	5.00	5.00	5.00	B, J	5.00UJ	122352-001	SW846-8260D
NWTA3-MW3D (Duplicate) 18-Apr-24	Methylene Chloride	1.34	0.500	5.00	5.00	5.00	B, J	5.00UJ	122353-001	SW846-8260D
OBS-MW1 11-Apr-24	Methylene Chloride	2.37	0.500	5.00	5.00	5.00	B, J	5.00UJ	122330-001	SW846-8260D
PL-2 24-Apr-24	Methylene Chloride	0.780	0.500	5.00	5.00	5.00	J	5.00UJ	122367-001	SW846-8260D
PL-4 25-Apr-24	Methylene Chloride	0.860	0.500	5.00	5.00	5.00	J	5.00UJ	122371-001	SW846-8260D
SFR-4T 29-Apr-24	Methylene Chloride	0.870	0.500	5.00	5.00	5.00	J	5.00UJ	122384-001	SW846-8260D
SWTA3-MW2 16-Apr-24	Methylene Chloride	1.99	0.500	5.00	5.00	5.00	B, J	5.00UJ	122340-001	SW846-8260D
SWTA3-MW2 (Duplicate) 16-Apr-24	Methylene Chloride	2.16	0.500	5.00	5.00	5.00	B, J	5.00UJ	122341-001	SW846-8260D
SWTA3-MW3	Methylene Chloride	2.22	0.500	5.00	5.00	5.00	B, J	5.00UJ	122336-001	SW846-8260D
15-Apr-24	Toluene	0.400	0.333	1.00	1000	1000	J		122336-001	SW846-8260D
SWTA3-MW4 17-Apr-24	Methylene Chloride	1.18	0.500	5.00	5.00	5.00	B, J	5.00UJ	122346-001	SW846-8260D
TRE-1	Chloroform	0.820	0.333	1.00	80.0	100	J		122386-001	SW846-8260D
01-May-24	Methylene Chloride	0.930	0.500	5.00	5.00	5.00	B, J	5.00UJ	122386-001	SW846-8260D

See notes at end of tables.

Table 2A-2
Method Detection Limits for Volatile Organic Compounds and High Explosive Compounds, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Analyte	MDL[b] (µg/L)	Analytical Method[g]	Analyte	MDL[b] (µg/L)	Analytical Method[g]
1,1,1,2-Tetrachloroethane	0.333	SW846-8260D	Ethylbenzene	0.333	SW846-8260D
1,1,1-Trichloroethane	0.333	SW846-8260D	Hexachlorobutadiene	0.333	SW846-8260D
1,1,2,2-Tetrachloroethane	0.333	SW846-8260D	Isopropylbenzene	0.333	SW846-8260D
1,1,2-Trichloroethane	0.333	SW846-8260D	Methylene chloride	0.500	SW846-8260D
1,1-Dichloroethane	0.333	SW846-8260D	Naphthalene	0.333	SW846-8260D
1,1-Dichloroethene	0.333	SW846-8260D	Styrene	0.333	SW846-8260D
1,1-Dichloropropene	0.333	SW846-8260D	Tert-butyl methyl ether	0.333	SW846-8260D
1,2,3-Trichlorobenzene	0.333	SW846-8260D	Tetrachloroethene	0.333	SW846-8260D
1,2,3-Trichloropropane	0.333	SW846-8260D	Toluene	0.333	SW846-8260D
1,2,4-Trichlorobenzene	0.333	SW846-8260D	Trichloroethene	0.333	SW846-8260D
1,2,4-Trimethylbenzene	0.333	SW846-8260D	Trichlorofluoromethane	0.333	SW846-8260D
1,2-Dibromo-3-chloropropane	0.333	SW846-8260D	Vinyl chloride	0.333	SW846-8260D
1,2-Dibromoethane	0.333	SW846-8260D	cis-1,2-Dichloroethene	0.333	SW846-8260D
1,2-Dichlorobenzene	0.333	SW846-8260D	cis-1,3-Dichloropropene	0.333	SW846-8260D
1,2-Dichloroethane	0.333	SW846-8260D	m-,p-Xylene	0.500	SW846-8260D
1,2-Dichloropropane	0.333	SW846-8260D	n-Butylbenzene	0.333	SW846-8260D
1,3,5-Trimethylbenzene	0.500	SW846-8260D	n-Propylbenzene	0.333	SW846-8260D
1,3-Dichlorobenzene	0.333	SW846-8260D	o-Xylene	0.333	SW846-8260D
1,3-Dichloropropane	0.333	SW846-8260D	sec-Butylbenzene	0.333	SW846-8260D
1,4-Dichlorobenzene	0.333	SW846-8260D	tert-Butylbenzene	0.333	SW846-8260D
2,2-Dichloropropane	0.333	SW846-8260D	trans-1,2-Dichloroethene	0.333	SW846-8260D
2-Chlorotoluene	0.333	SW846-8260D	trans-1,3-Dichloropropene	0.333	SW846-8260D
4-Chlorotoluene	0.333	SW846-8260D	1,3,5-Trinitrobenzene	0.0841 – 0.0869	SW846-8330B
4-Isopropyltoluene	0.333	SW846-8260D	1,3-Dinitrobenzene	0.0841 – 0.0869	SW846-8330B
Benzene	0.333	SW846-8260D	2,4,6-Trinitrotoluene	0.0841 – 0.0869	SW846-8330B
Bromobenzene	0.333	SW846-8260D	2,4-Dinitrotoluene	0.0841 – 0.0869	SW846-8330B
Bromochloromethane	0.333	SW846-8260D	2,6-Dinitrotoluene	0.0841 – 0.0869	SW846-8330B
Bromodichloromethane	0.333	SW846-8260D	2-Amino-4,6-dinitrotoluene	0.0841 – 0.0869	SW846-8330B
Bromoform	0.333	SW846-8260D	2-Nitrotoluene	0.0863 – 0.0891	SW846-8330B
Carbon tetrachloride	0.333	SW846-8260D	3-Nitrotoluene	0.0841 – 0.0869	SW846-8330B
Chlorobenzene	0.333	SW846-8260D	4-Amino-2,6-dinitrotoluene	0.0841 – 0.0869	SW846-8330B
Chloroethane	0.333	SW846-8260D	4-Nitrotoluene	0.158 – 0.163	SW846-8330B
Chloroform	0.333	SW846-8260D	HMX	0.0841 – 0.0869	SW846-8330B
Chloromethane	0.333	SW846-8260D	Nitrobenzene	0.0841 – 0.0869	SW846-8330B
Dibromochloromethane	0.333	SW846-8260D	Pentaerythritol tetranitrate	0.105 – 0.109	SW846-8330B
Dibromomethane	0.333	SW846-8260D	RDX	0.0841 – 0.0869	SW846-8330B
Dichlorodifluoromethane	0.355	SW846-8260D	Tetryl	0.0841 – 0.0869	SW846-8330B

See notes at end of tables.

Table 2A-3
Summary of Nitrate Plus Nitrite Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
Coyote Springs 10-Apr-24	Nitrate plus nitrite	0.615	0.0850	0.250	10.0			122324-005	EPA 353.2
CCBA-MW2 02-May-24	Nitrate plus nitrite	3.49	0.170	0.500	10.0			122388-005	EPA 353.2
CTF-MW1 06-May-24	Nitrate plus nitrite	8.03	0.425	1.25	10.0			122396-005	EPA 353.2
CTF-MW1 (Duplicate) 06-May-24	Nitrate plus nitrite	8.15	0.425	1.25	10.0			122397-005	EPA 353.2
CYN-MW5 07-May-24	Nitrate plus nitrite	2.26	0.170	0.500	10.0			122405-005	EPA 353.2
Greystone-MW2 08-May-24	Nitrate plus nitrite	4.86	0.170	0.500	10.0			122399-005	EPA 353.2
MRN-2 22-Apr-24	Nitrate plus nitrite	3.79	0.170	0.500	10.0			122357-005	EPA 353.2
MRN-3D 23-Apr-24	Nitrate plus nitrite	3.03	0.0850	0.250	10.0		J	122359-005	EPA 353.2
NWTA3-MW3D 18-Apr-24	Nitrate plus nitrite	0.945	0.0850	0.250	10.0			122352-005	EPA 353.2
NWTA3-MW3D (Duplicate) 18-Apr-24	Nitrate plus nitrite	0.925	0.0850	0.250	10.0			122353-005	EPA 353.2
OBS-MW1 11-Apr-24	Nitrate plus nitrite	1.92	0.0850	0.250	10.0			122330-005	EPA 353.2
PL-2 24-Apr-24	Nitrate plus nitrite	2.98	0.170	0.500	10.0			122367-005	EPA 353.2
PL-4 25-Apr-24	Nitrate plus nitrite	5.55	0.170	0.500	10.0			122371-006	EPA 353.2
SFR-2S 30-Apr-24	Nitrate plus nitrite	0.947	0.0170	0.0500	10.0			122377-006	EPA 353.2
SFR-2S (Duplicate) 30-Apr-24	Nitrate plus nitrite	0.949	0.0170	0.0500	10.0			122378-006	EPA 353.2
SFR-4T 29-Apr-24	Nitrate plus nitrite	0.241	0.0170	0.0500	10.0			122384-006	EPA 353.2
SWTA3-MW2 16-Apr-24	Nitrate plus nitrite	1.28	0.0850	0.250	10.0			122340-006	EPA 353.2
SWTA3-MW2 (Duplicate) 16-Apr-24	Nitrate plus nitrite	1.10	0.0850	0.250	10.0			122341-006	EPA 353.2

See notes at end of tables.

Table 2A-3 (concluded)
Summary of Nitrate Plus Nitrite Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
SWTA3-MW3 15-Apr-24	Nitrate plus nitrite	0.730	0.0850	0.250	10.0			122336-006	EPA 353.2
SWTA3-MW4 17-Apr-24	Nitrate plus nitrite	1.19	0.0850	0.250	10.0			122346-006	EPA 353.2
TRE-1 01-May-24	Nitrate plus nitrite	2.67	0.170	0.500	10.0		J	122386-006	EPA 353.2

See notes at end of tables.

Table 2A-4
Summary of Alkalinity, Major Anion, Total Organic Halogen, Total Phenol, and Total Cyanide Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
Coyote Springs	Total Organic Halogens	0.0680	0.00333	0.0100	NE	NE		J	122324-002	SW846-9020B
10-Apr-24	Bromide	0.264	0.0670	0.200	NE	NE	N	J+	122324-006	SW846-9056A
	Chloride	**471**	6.70	20.0	NE	250	B		122324-006	SW846-9056A
	Fluoride	1.38	0.0330	0.100	4.00	1.60			122324-006	SW846-9056A
	Sulfate	126	13.3	40.0	NE	600			122324-006	SW846-9056A
	Alkalinity as CaCO3	1020	0.725	2.00	NE	NE			122324-004	SM 2320B
	Total Phenol	0.00427	0.00167	0.00500	NE	0.005	J, N	J	122324-003	SW846-9066
	Total Cyanide	ND	0.00167	0.00500	0.200	0.200	U	R	122324-007	SW846-9012B
CCCA-MW2	Total Organic Halogens	0.0129	0.00333	0.0100	NE	NE		J+	122388-002	SW846-9020B
02-May-24	Bromide	0.653	0.0670	0.200	NE	NE			122388-006	SW846-9056A
	Chloride	38.3	0.670	2.00	NE	250			122388-006	SW846-9056A
	Fluoride	1.53	0.0330	0.100	4.00	1.60			122388-006	SW846-9056A
	Sulfate	96.3	1.33	4.00	NE	600			122388-006	SW846-9056A
	Alkalinity as CaCO3	187	0.725	2.00	NE	NE			122388-004	SM 2320B
	Total Phenol	0.00268	0.00167	0.00500	NE	0.005	B, J	0.005UJ	122388-003	SW846-9066
	Total Cyanide	ND	0.00167	0.00500	0.200	0.200	U	R	122388-007	SW846-9012B
CTF-MW1	Total Organic Halogens	0.00718	0.00333	0.0100	NE	NE	J	0.01U	122396-002	SW846-9020B
06-May-24	Bromide	0.673	0.0670	0.200	NE	NE			122396-006	SW846-9056A
	Chloride	34.6	0.670	2.00	NE	250			122396-006	SW846-9056A
	Fluoride	1.43	0.0330	0.100	4.00	1.60			122396-006	SW846-9056A
	Sulfate	74.7	1.33	4.00	NE	600			122396-006	SW846-9056A
	Alkalinity as CaCO3	206	0.725	2.00	NE	NE			122396-004	SM 2320B
	Total Phenol	0.00229	0.00167	0.00500	NE	0.005	B, J	0.005UJ	122396-003	SW846 9066
	Total Cyanide	ND	0.00167	0.00500	0.200	0.200	U	R	122396-007	SW846-9012B
CTF-MW1 (Duplicate)	Total Organic Halogens	0.00754	0.00333	0.0100	NE	NE	J	0.01U	122397-002	SW846-9020B
06-May-24	Bromide	0.613	0.0670	0.200	NE	NE			122397-006	SW846-9056A
	Chloride	35.6	0.670	2.00	NE	250			122397-006	SW846-9056A
	Fluoride	1.44	0.0330	0.100	4.00	1.60			122397-006	SW846-9056A
	Sulfate	76.4	1.33	4.00	NE	600			122397-006	SW846-9056A
	Alkalinity as CaCO3	206	0.725	2.00	NE	NE			122397-004	SM 2320B
	Total Phenol	0.00270	0.00167	0.00500	NE	0.005	B, J	0.005UJ	122397-003	SW846-9066
	Total Cyanide	ND	0.00167	0.00500	0.200	0.200	U	R	122397-007	SW846-9012B

See notes at end of tables.

Table 2A-4 (continued)
Summary of Alkalinity, Major Anion, Total Organic Halogen, Total Phenol, and Total Cyanide Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CYN-MW5	Total Organic Halogens	0.00950	0.00333	0.0100	NE	NE	J		122405-002	SW846-9020B
07-May-24	Bromide	0.167	0.0670	0.200	NE	NE	J		122405-006	SW846-9056A
	Chloride	12.8	0.134	0.400	NE	250			122405-006	SW846-9056A
	Fluoride	0.342	0.0330	0.100	4.00	1.60			122405-006	SW846-9056A
	Sulfate	26.5	0.266	0.800	NE	600			122405-006	SW846-9056A
	Alkalinity as CaCO3	141	0.725	2.00	NE	NE			122405-004	SM 2320B
	Total Phenol	**0.00584**	0.00167	0.00500	NE	0.005	B	0.005UJ	122405-003	SW846-9066
	Total Cyanide	ND	0.00167	0.00500	0.200	0.200	U	R	122405-007	SW846-9012B
Greystone-MW2	Total Organic Halogens	ND	0.00333	0.0100	NE	NE	U		122399-002	SW846-9020B
08-May-24	Bromide	0.794	0.0670	0.200	NE	NE			122399-006	SW846-9056A
	Chloride	117	1.34	4.00	NE	250			122399-006	SW846-9056A
	Fluoride	0.856	0.0330	0.100	4.00	1.60			122399-006	SW846-9056A
	Sulfate	50.6	2.66	8.00	NE	600			122399-006	SW846-9056A
	Alkalinity as CaCO3	412	0.725	2.00	NE	NE			122399-004	SM 2320B
	Total Phenol	0.00319	0.00167	0.00500	NE	0.005	B, J	0.005UJ	122399-003	SW846-9066
	Total Cyanide	ND	0.00167	0.00500	0.200	0.200	U	R	122399-007	SW846-9012B
MRN-2	Total Organic Halogens	ND	0.00333	0.0100	NE	NE	U		122357-002	SW846-9020B
22-Apr-24	Bromide	0.189	0.0670	0.200	NE	NE	J		122357-006	SW846-9056A
	Chloride	13.4	0.335	1.00	NE	250			122357-006	SW846-9056A
	Fluoride	0.632	0.0330	0.100	4.00	1.60			122357-006	SW846-9056A
	Sulfate	53.5	0.665	2.00	NE	600			122357-006	SW846-9056A
	Alkalinity as CaCO3	154	0.725	2.00	NE	NE			122357-004	SM 2320B
	Total Phenol	0.00207	0.00167	0.00500	NE	0.005	B, J	0.005UJ	122357-003	SW846-9066
	Total Cyanide	ND	0.00167	0.00500	0.200	0.200	U	R	122357-007	SW846-9012B
MRN-3D	Total Organic Halogens	ND	0.00333	0.0100	NE	NE	U	UJ	122359-002	SW846-9020B
23-Apr-24	Bromide	0.200	0.0670	0.200	NE	NE	J	J	122359-006	SW846-9056A
	Chloride	14.6	0.335	1.00	NE	250		J	122359-006	SW846-9056A
	Fluoride	0.478	0.0330	0.100	4.00	1.60		J	122359-006	SW846-9056A
	Sulfate	75.4	0.665	2.00	NE	600		J	122359-006	SW846-9056A
	Alkalinity as CaCO3	158	0.725	2.00	NE	NE		J	122359-004	SM 2320B
	Total Phenol	**0.0132**	0.00167	0.00500	NE	0.005	B	J-	122359-003	SW846-9066
	Total Cyanide	ND	0.00167	0.00500	0.200	0.200	U	R	122359-007	SW846-9012B

See notes at end of tables.

Table 2A-4 (continued)
Summary of Alkalinity, Major Anion, Total Organic Halogen, Total Phenol, and Total Cyanide Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
NWTA3-MW3D	Total Organic Halogens	ND	0.00333	0.0100	NE	NE	U		122352-002	SW846-9020B
18-Apr-24	Bromide	0.171	0.0670	0.200	NE	NE	J		122352-006	SW846-9056A
	Chloride	11.1	0.335	1.00	NE	250			122352-006	SW846-9056A
	Fluoride	0.718	0.0330	0.100	4.00	1.60			122352-006	SW846-9056A
	Sulfate	54.2	0.665	2.00	NE	600			122352-006	SW846-9056A
	Alkalinity as CaCO3	142	0.725	2.00	NE	NE			122352-004	SM 2320B
	Total Phenol	ND	0.00167	0.00500	NE	0.005	U	R	122352-003	SW846-9066
	Total Cyanide	ND	0.00167	0.00500	0.200	0.200	U	R	122352-007	SW846-9012B
NWTA3-MW3D	Total Organic Halogens	ND	0.00333	0.0100	NE	NE	U		122353-002	SW846-9020B
(Duplicate)	Bromide	0.184	0.0670	0.200	NE	NE	J		122353-006	SW846-9056A
18-Apr-24	Chloride	11.4	0.335	1.00	NE	250			122353-006	SW846-9056A
	Fluoride	0.733	0.0330	0.100	4.00	1.60			122353-006	SW846-9056A
	Sulfate	56.0	0.665	2.00	NE	600			122353-006	SW846-9056A
	Alkalinity as CaCO3	142	0.725	2.00	NE	NE			122353-004	SM 2320B
	Total Phenol	**0.0645**	0.00167	0.00500	NE	0.005	B	J-	122353-003	SW846-9066
	Total Cyanide	ND	0.00167	0.00500	0.200	0.200	U	R	122353-007	SW846-9012B
OBS-MW1	Total Organic Halogens	ND	0.00333	0.0100	NE	NE	U		122330-002	SW846-9020B
11-Apr-24	Bromide	0.421	0.0670	0.200	NE	NE	N	J+	122330-006	SW846-9056A
	Chloride	27.1	0.670	2.00	NE	250	B	J	122330-006	SW846-9056A
	Fluoride	**2.08**	0.0330	0.100	4.00	1.60			122330-006	SW846-9056A
	Sulfate	88.5	1.33	4.00	NE	600		J	122330-006	SW846-9056A
	Alkalinity as CaCO3	165	0.725	2.00	NE	NE			122330-004	SM 2320B
	Total Phenol	ND	0.00167	0.00500	NE	0.005	U, N	R	122330-003	SW846-9066
	Total Cyanide	ND	0.00167	0.00500	0.200	0.200	U	R	122330-007	SW846-9012B
PL-2	Total Organic Halogens	ND	0.00333	0.0100	NE	NE	H, U	UJ	122367-002	SW846-9020B
24-Apr-24	Bromide	0.216	0.0670	0.200	NE	NE			122367-006	SW846-9056A
	Chloride	15.6	0.335	1.00	NE	250			122367-006	SW846-9056A
	Fluoride	0.515	0.0330	0.100	4.00	1.60			122367-006	SW846-9056A
	Sulfate	78.3	0.665	2.00	NE	600			122367-006	SW846-9056A
	Alkalinity as CaCO3	156	0.725	2.00	NE	NE			122367-004	SM 2320B
	Total Phenol	0.00280	0.00167	0.00500	NE	0.005	B, J	0.005UJ	122367-003	SW846-9066
	Total Cyanide	ND	0.00167	0.00500	0.200	0.200	U	R	122367-007	SW846-9012B

See notes at end of tables.

Table 2A-4 (continued)
Summary of Alkalinity, Major Anion, Total Organic Halogen, Total Phenol, and Total Cyanide Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
PL-4	Total Organic Halogens	0.00624	0.00333	0.0100	NE	NE	J		122371-002	SW846-9020B
25-Apr-24	Bromide	0.238	0.0670	0.200	NE	NE			122371-006	SW846-9056A
	Chloride	16.6	0.335	1.00	NE	250			122371-006	SW846-9056A
	Fluoride	0.383	0.0330	0.100	4.00	1.60			122371-006	SW846-9056A
	Sulfate	75.0	0.665	2.00	NE	600			122371-006	SW846-9056A
	Alkalinity as CaCO3	169	0.725	2.00	NE	NE			122371-004	SM 2320B
	Total Phenol	ND	0.00167	0.00500	NE	0.005	U	R	122371-003	SW846-9066
	Total Cyanide	ND	0.00167	0.00500	0.200	0.200	U	R	122371-007	SW846-9012B
SFR-2S	Bromide	1.10	0.0670	0.200	NE	NE			122377-007	SW846-9056A
30-Apr-24	Chloride	131	3.35	10.0	NE	250		J	122377-007	SW846-9056A
	Fluoride	**1.62**	0.0330	0.100	4.00	1.60			122377-007	SW846-9056A
	Sulfate	80.0	0.665	2.00	NE	600			122377-007	SW846-9056A
	Alkalinity as CaCO3	374	0.725	2.00	NE	NE			122377-005	SM 2320B
	Total Cyanide	ND	0.00167	0.00500	0.200	0.200	U	R	122377-008	SW846-9012B
SFR-2S (Duplicate)	Bromide	1.13	0.0670	0.200	NE	NE			122378-007	SW846-9056A
30-Apr-24	Chloride	131	3.35	10.0	NE	250		J	122378-007	SW846-9056A
	Fluoride	**1.64**	0.0330	0.100	4.00	1.60			122378-007	SW846-9056A
	Sulfate	80.2	0.665	2.00	NE	600			122378-007	SW846-9056A
	Alkalinity as CaCO3	373	0.725	2.00	NE	NE			122378-005	SM 2320B
	Total Cyanide	ND	0.00167	0.00500	0.200	0.200	U	R	122378-008	SW846-9012B
SFR-2S	Total Organic Halogens	0.0491	0.00333	0.0100	NE	NE	N	J+	122615-002	SW846-9020B
22-May-24	Total Phenol	ND	0.00167	0.00500	NE	0.005	U	R	122615-003	SW846-9056A
SFR-2S (Duplicate)	Total Organic Halogens	0.0358	0.00333	0.0100	NE	NE	N	J+	122616-002	SW846-9020B
22-May-24	Total Phenol	0.00191	0.00167	0.00500	NE	0.005	B, J	0.005UJ	122616-003	SW846-9056A

See notes at end of tables.

Table 2A-4 (continued)
Summary of Alkalinity, Major Anion, Total Organic Halogen, Total Phenol, and Total Cyanide Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
SFR-4T	Total Organic Halogens	0.0186	0.00333	0.0100	NE	NE		J	122384-003	SW846-9020B
29-Apr-24	Bromide	4.29	0.0670	0.200	NE	NE			122384-007	SW846-9056A
	Chloride	217	13.4	40.0	NE	250		J	122384-007	SW846-9056A
	Fluoride	ND	0.0330	0.100	4.00	1.60	U		122384-007	SW846-9056A
	Sulfate	**2100**	26.6	80.0	NE	600		J	122384-007	SW846-9056A
	Alkalinity as CaCO3	111	0.725	2.00	NE	NE			122384-005	SM 2320B
	Total Phenol	ND	0.00167	0.00500	NE	0.005	U	R	122384-004	SW846-9066
	Total Cyanide	ND	0.00167	0.00500	0.200	0.200	U	R	122384-008	SW846-9012B
SWTA3-MW2	Total Organic Halogens	0.0101	0.00333	0.0100	NE	NE	N	J	122340-003	SW846-9020B
16-Apr-24	Bromide	0.184	0.0670	0.200	NE	NE	J, N	J+	122340-007	SW846-9056A
	Chloride	18.0	0.335	1.00	NE	250	B	J	122340-007	SW846-9056A
	Fluoride	0.975	0.0330	0.100	4.00	1.60			122340-007	SW846-9056A
	Sulfate	52.8	0.665	2.00	NE	600		J	122340-007	SW846-9056A
	Alkalinity as CaCO3	172	0.725	2.00	NE	NE			122340-005	SM 2320B
	Total Phenol	ND	0.00167	0.00500	NE	0.005	U	R	122340-004	SW846-9066
	Total Cyanide	ND	0.00167	0.00500	0.200	0.200	U	R	122340-008	SW846-9012B
SWTA3-MW2 (Duplicate)	Total Organic Halogens	0.0113	0.00333	0.0100	NE	NE	N	J	122341-003	SW846-9020B
16-Apr-24	Bromide	0.186	0.0670	0.200	NE	NE	J, N	J+	122341-007	SW846-9056A
	Chloride	18.3	0.335	1.00	NE	250	B	J	122341-007	SW846-9056A
	Fluoride	0.960	0.0330	0.100	4.00	1.60			122341-007	SW846-9056A
	Sulfate	53.7	0.665	2.00	NE	600		J	122341-007	SW846-9056A
	Alkalinity as CaCO3	173	0.725	2.00	NE	NE			122341-005	SM 2320B
	Total Phenol	ND	0.00167	0.00500	NE	0.005	U	R	122341-004	SW846-9066
	Total Cyanide	ND	0.00167	0.00500	0.200	0.200	U	R	122341-008	SW846-9012B
SWTA3-MW3	Total Organic Halogens	0.00638	0.00333	0.0100	NE	NE	J		122336-003	SW846-9020B
15-Apr-24	Bromide	0.187	0.0670	0.200	NE	NE	J, N	J+	122336-007	SW846-9056A
	Chloride	14.5	0.335	1.00	NE	250	B	J	122336-007	SW846-9056A
	Fluoride	1.26	0.0330	0.100	4.00	1.60			122336-007	SW846-9056A
	Sulfate	61.8	0.665	2.00	NE	600		J	122336-007	SW846-9056A
	Alkalinity as CaCO3	171	0.725	2.00	NE	NE			122336-005	SM 2320B
	Total Phenol	ND	0.00167	0.00500	NE	0.005	U	R	122336-004	SW846-9066
	Total Cyanide	ND	0.00167	0.00500	0.200	0.200	U	R	122336-008	SW846-9012B

See notes at end of tables.

Table 2A-4 (concluded)
Summary of Alkalinity, Major Anion, Total Organic Halogen, Total Phenol, and Total Cyanide Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
SWTA3-MW4	Total Organic Halogens	ND	0.00333	0.0100	NE	NE	U		122346-003	SW846-9020B
17-Apr-24	Bromide	0.171	0.0670	0.200	NE	NE	J		122346-007	SW846-9056A
	Chloride	15.9	0.335	1.00	NE	250			122346-007	SW846-9056A
	Fluoride	**1.71**	0.0330	0.100	4.00	1.60			122346-007	SW846-9056A
	Sulfate	52.8	0.665	2.00	NE	600			122346-007	SW846-9056A
	Alkalinity as CaCO3	184	0.725	2.00	NE	NE			122346-005	SM 2320B
	Total Phenol	0.0157	0.00167	0.00500	NE	0.005	B	J-	122346-004	SW846-9066
	Total Cyanide	ND	0.00167	0.00500	0.200	0.200	U	R	122346-008	SW846-9012B
TRE-1	Total Organic Halogens	0.0598	0.00333	0.0100	NE	NE		J+	122386-003	SW846-9020B
01-May-24	Bromide	1.24	0.0670	0.200	NE	NE			122386-007	SW846-9056A
	Chloride	148	1.34	4.00	NE	250			122386-007	SW846-9056A
	Fluoride	1.55	0.0330	0.100	4.0	1.60			122386-007	SW846-9056A
	Sulfate	116	2.66	8.00	NE	600			122386-007	SW846-9056A
	Alkalinity as CaCO3	493	0.725	2.00	NE	NE			122386-005	SM 2320B
	Total Phenol	ND	0.00167	0.00500	NE	0.005	U	R	122386-004	SW846-9066
	Total Cyanide	ND	0.00167	0.00500	0.200	0.200	U	R	122386-008	SW846-9012B

See notes at end of tables.

Table 2A-5
Summary of Mercury Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
Coyote Springs 10-Apr-24	ND	0.0000670	0.000200	0.002	U		122324-009	SW846-7470A
CCBA-MW2 02-May-24	ND	0.0000670	0.000200	0.002	U		122388-009	SW846-7470A
CTF-MW1 06-May-24	ND	0.0000670	0.000200	0.002	U		122396-009	SW846-7470A
CTF-MW1 (Duplicate) 06-May-24	ND	0.0000670	0.000200	0.002	U		122397-009	SW846-7470A
CYN-MW5 07-May-24	ND	0.0000670	0.000200	0.002	U		122405-009	SW846-7470A
Greystone-MW2 08-May-24	ND	0.0000670	0.000200	0.002	U		122399-009	SW846-7470A
MRN-2 22-Apr-24	ND	0.0000670	0.000200	0.002	U		122357-009	SW846-7470A
MRN-3D 23-Apr-24	ND	0.0000670	0.000200	0.002	U		122359-009	SW846-7470A
NWTA3-MW3D 18-Apr-24	ND	0.0000670	0.000200	0.002	U		122352-009	SW846-7470A
NWTA3-MW3D (Duplicate) 18-Apr-24	ND	0.0000670	0.000200	0.002	U		122353-009	SW846-7470A
OBS-MW1 11-Apr-24	ND	0.0000670	0.000200	0.002	U		122330-009	SW846-7470A
PL-2 24-Apr-24	ND	0.0000670	0.000200	0.002	U		122367-009	SW846-7470A
PL-4 25-Apr-24	ND	0.0000670	0.000200	0.002	U		122371-009	SW846-7470A
SFR-2S 30-Apr-24	ND	0.0000670	0.000200	0.002	U		122377-010	SW846-7470A
SFR-2S (Duplicate) 30-Apr-24	ND	0.0000670	0.000200	0.002	U		122378-010	SW846-7470A
SFR-4T 29-Apr-24	ND	0.0000670	0.000200	0.002	U		122384-010	SW846-7470A
SWTA3-MW2 16-Apr-24	0.000141	0.0000670	0.000200	0.002	J		122340-010	SW846-7470A
SWTA3-MW2 (Duplicate) 16-Apr-24	ND	0.0000670	0.000200	0.002	U		122341-010	SW846-7470A

See notes at end of tables.

Table 2A-5 (concluded)
Summary of Mercury Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
SWTA3-MW3 15-Apr-24	ND	0.0000670	0.000200	0.002	U		122336-010	SW846-7470A
SWTA3-MW4 17-Apr-24	ND	0.0000670	0.000200	0.002	U		122346-010	SW846-7470A
TRE-1 01-May-24	ND	0.0000670	0.000200	0.002	U		122386-010	SW846-7470A

See notes at end of tables.

Table 2A-6
Summary of Target Analyte List Metals and Total Uranium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
Coyote Springs	Aluminum	0.201	0.0193	0.0500	NE	5.00			122324-008	SW846-6020B
10-Apr-24	Antimony	ND	0.00100	0.00300	0.006	0.006	U		122324-008	SW846-6020B
	Arsenic	0.00818	0.00200	0.00500	0.010	0.010			122324-008	SW846-6020B
	Barium	0.0396	0.000670	0.00400	2.00	2.00			122324-008	SW846-6020B
	Beryllium	**0.00718**	0.000200	0.000500	0.004	0.004			122324-008	SW846-6020B
	Cadmium	ND	0.000300	0.00100	0.005	0.005	U		122324-008	SW846-6020B
	Calcium	263	0.800	2.00	NE	NE			122324-008	SW846-6020B
	Chromium	ND	0.00300	0.0100	0.100	0.050	U		122324-008	SW846-6020B
	Cobalt	0.00935	0.000300	0.00100	NE	0.050			122324-008	SW846-6020B
	Copper	0.000615	0.000300	0.00200	1.30	1.00	J		122324-008	SW846-6020B
	Iron	0.255	0.0330	0.100	NE	1.00			122324-008	SW846-6020B
	Lead	ND	0.000500	0.00200	0.010	0.015	U		122324-008	SW846-6020B
	Magnesium	61.5	0.100	0.300	NE	NE	B		122324-008	SW846-6020B
	Manganese	1.35	0.0100	0.0500	NE	0.200		J	122324-008	SW846-6020B
	Mercury	ND	0.0000670	0.000200	0.002	0.002	U		122324-008	SW846-7470A
	Nickel	0.0235	0.000600	0.00200	NE	0.200			122324-008	SW846-6020B
	Potassium	28.8	0.0800	0.300	NE	NE			122324-008	SW846-6020B
	Selenium	ND	0.00150	0.00500	0.050	0.050	U		122324-008	SW846-6020B
	Silver	ND	0.000300	0.00100	NE	0.050	U		122324-008	SW846-6020B
	Sodium	393	0.800	2.50	NE	NE			122324-008	SW846-6020B
	Thallium	0.00120	0.000600	0.00200	0.002	0.002	J		122324-008	SW846-6020B
	Vanadium	0.00341	0.00330	0.0200	NE	NE	J		122324-008	SW846-6020B
	Zinc	0.0408	0.00330	0.0200	NE	10.0			122324-008	SW846-6020B

See notes at end of tables.

Table 2A-6 (continued)
Summary of Target Analyte List Metals and Total Uranium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CCBA-MW2	Aluminum	ND	0.0193	0.0500	NE	NE	U		122388-008	SW846-6020B
02-May-24	Antimony	ND	0.00100	0.00300	0.006	0.006	U		122388-008	SW846-6020B
	Arsenic	0.00203	0.00200	0.00500	0.010	0.010	J		122388-008	SW846-6020B
	Barium	0.0490	0.000670	0.00400	2.00	2.00			122388-008	SW846-6020B
	Beryllium	ND	0.000200	0.000500	0.004	0.004	U		122388-008	SW846-6020B
	Cadmium	ND	0.000300	0.00100	0.005	0.005	U		122388-008	SW846-6020B
	Calcium	77.2	0.800	2.00	NE	NE			122388-008	SW846-6020B
	Chromium	ND	0.00300	0.0100	0.100	0.050	U		122388-008	SW846-6020B
	Cobalt	ND	0.000300	0.00100	NE	NE	U		122388-008	SW846-6020B
	Copper	ND	0.000300	0.00200	1.30	NE	U		122388-008	SW846-6020B
	Iron	ND	0.0330	0.100	NE	NE	U		122388-008	SW846-6020B
	Lead	ND	0.000500	0.00200	0.010	0.015	U		122388-008	SW846-6020B
	Magnesium	16.6	0.0100	0.0300	NE	NE			122388-008	SW846-6020B
	Manganese	ND	0.00100	0.00500	NE	NE	U		122388-008	SW846-6020B
	Mercury	ND	0.0000670	0.000200	0.002	0.002	U		122388-008	SW846-7470A
	Nickel	ND	0.000600	0.00200	NE	NE	U		122388-008	SW846-6020B
	Potassium	1.44	0.0800	0.300	NE	NE			122388-008	SW846-6020B
	Selenium	0.00358	0.00150	0.00500	0.050	0.050	J		122388-008	SW846-6020B
	Silver	ND	0.000300	0.00100	NE	0.050	U		122388-008	SW846-6020B
	Sodium	52.5	0.800	2.50	NE	NE			122388-008	SW846-6020B
	Thallium	ND	0.000600	0.00200	0.002	0.002	U		122388-008	SW846-6020B
	Vanadium	0.0119	0.00330	0.0200	NE	NE	J		122388-008	SW846-6020B
	Zinc	ND	0.00330	0.0200	NE	NE	U		122388-008	SW846-6020B

See notes at end of tables.

Table 2A-6 (continued)
Summary of Target Analyte List Metals and Total Uranium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CTF-MW1	Aluminum	ND	0.0193	0.0500	NE	NE	U		122396-008	SW846-6020B
06-May-24	Antimony	ND	0.00100	0.00300	0.006	0.006	U		122396-008	SW846-6020B
	Arsenic	0.00230	0.00200	0.00500	0.010	0.010	J		122396-008	SW846-6020B
	Barium	0.0458	0.000670	0.00400	2.00	2.00			122396-008	SW846-6020B
	Beryllium	ND	0.000200	0.000500	0.004	0.004	U		122396-008	SW846-6020B
	Cadmium	ND	0.000300	0.00100	0.005	0.005	U		122396-008	SW846-6020B
	Calcium	87.6	0.800	2.00	NE	NE			122396-008	SW846-6020B
	Chromium	ND	0.00300	0.0100	0.100	0.050	U		122396-008	SW846-6020B
	Cobalt	ND	0.000300	0.00100	NE	NE	U		122396-008	SW846-6020B
	Copper	ND	0.000300	0.00200	1.30	NE	U		122396-008	SW846-6020B
	Iron	ND	0.0330	0.100	NE	NE	U		122396-008	SW846-6020B
	Lead	ND	0.000500	0.00200	0.010	0.015	U		122396-008	SW846-6020B
	Magnesium	18.4	0.0100	0.0300	NE	NE			122396-008	SW846-6020B
	Manganese	ND	0.00100	0.00500	NE	NE	U		122396-008	SW846-6020B
	Mercury	ND	0.0000670	0.000200	0.002	0.002	U		122396-008	SW846-7470A
	Nickel	ND	0.000600	0.00200	NE	NE	U		122396-008	SW846-6020B
	Potassium	1.78	0.0800	0.300	NE	NE			122396-008	SW846-6020B
	Selenium	0.00432	0.00150	0.00500	0.050	0.050	J		122396-008	SW846-6020B
	Silver	ND	0.000300	0.00100	NE	0.050	U		122396-008	SW846-6020B
	Sodium	31.1	0.0800	0.250	NE	NE			122396-008	SW846-6020B
	Thallium	ND	0.000600	0.00200	0.002	0.002	U		122396-008	SW846-6020B
	Vanadium	ND	0.00330	0.0200	NE	NE	U		122396-008	SW846-6020B
	Zinc	ND	0.00330	0.0200	NE	NE	U		122396-008	SW846-6020B

See notes at end of tables.

Table 2A-6 (continued)
Summary of Target Analyte List Metals and Total Uranium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CTF-MW1	Aluminum	ND	0.0193	0.0500	NE	NE	U		122397-008	SW846-6020B
(Duplicate)	Antimony	ND	0.00100	0.00300	0.006	0.006	U		122397-008	SW846-6020B
06-May-24	Arsenic	0.00253	0.00200	0.00500	0.010	0.010	J		122397-008	SW846-6020B
	Barium	0.0473	0.000670	0.00400	2.00	2.00			122397-008	SW846-6020B
	Beryllium	ND	0.000200	0.000500	0.004	0.004	U		122397-008	SW846-6020B
	Cadmium	ND	0.000300	0.00100	0.005	0.005	U		122397-008	SW846-6020B
	Calcium	88.0	0.800	2.00	NE	NE			122397-008	SW846-6020B
	Chromium	ND	0.00300	0.0100	0.100	0.050	U		122397-008	SW846-6020B
	Cobalt	ND	0.000300	0.00100	NE	NE	U		122397-008	SW846-6020B
	Copper	ND	0.000300	0.00200	1.30	NE	U		122397-008	SW846-6020B
	Iron	ND	0.0330	0.100	NE	NE	U		122397-008	SW846-6020B
	Lead	ND	0.000500	0.00200	0.010	0.015	U		122397-008	SW846-6020B
	Magnesium	19.2	0.0100	0.0300	NE	NE			122397-008	SW846-6020B
	Manganese	ND	0.00100	0.00500	NE	NE	U		122397-008	SW846-6020B
	Mercury	ND	0.0000670	0.000200	0.002	0.002	U		122397-008	SW846-7470A
	Nickel	ND	0.000600	0.00200	NE	NE	U		122397-008	SW846-6020B
	Potassium	1.87	0.0800	0.300	NE	NE			122397-008	SW846-6020B
	Selenium	0.00439	0.00150	0.00500	0.050	0.050	J		122397-008	SW846-6020B
	Silver	ND	0.000300	0.00100	NE	0.050	U		122397-008	SW846-6020B
	Sodium	31.9	0.0800	0.250	NE	NE			122397-008	SW846-6020B
	Thallium	ND	0.000600	0.00200	0.002	0.002	U		122397-008	SW846-6020B
	Vanadium	ND	0.00330	0.0200	NE	NE	U		122397-008	SW846-6020B
	Zinc	ND	0.00330	0.0200	NE	NE	U		122397-008	SW846-6020B

See notes at end of tables.

Table 2A-6 (continued)
Summary of Target Analyte List Metals and Total Uranium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CYN-MW5	Aluminum	ND	0.0193	0.0500	NE	NE	U		122405-008	SW846-6020B
07-May-24	Antimony	ND	0.00100	0.00300	0.006	0.006	U		122405-008	SW846-6020B
	Arsenic	0.00545	0.00200	0.00500	0.010	0.010			122405-008	SW846-6020B
	Barium	0.158	0.000670	0.00400	2.00	2.00			122405-008	SW846-6020B
	Beryllium	ND	0.000200	0.000500	0.004	0.004	U		122405-008	SW846-6020B
	Cadmium	ND	0.000300	0.00100	0.005	0.005	U		122405-008	SW846-6020B
	Calcium	49.5	0.0800	0.200	NE	NE			122405-008	SW846-6020B
	Chromium	ND	0.00300	0.0100	0.100	0.050	U		122405-008	SW846-6020B
	Cobalt	ND	0.000300	0.00100	NE	NE	U		122405-008	SW846-6020B
	Copper	0.000330	0.000300	0.00200	1.30	NE	J		122405-008	SW846-6020B
	Iron	ND	0.0330	0.100	NE	NE	U		122405-008	SW846-6020B
	Lead	ND	0.000500	0.00200	0.010	0.015	U		122405-008	SW846-6020B
	Magnesium	9.38	0.0100	0.0300	NE	NE			122405-008	SW846-6020B
	Manganese	ND	0.00100	0.00500	NE	NE	U		122405-008	SW846-6020B
	Mercury	ND	0.0000670	0.000200	0.002	0.002	U		122405-008	SW846-7470A
	Nickel	0.00105	0.000600	0.00200	NE	NE	J		122405-008	SW846-6020B
	Potassium	2.22	0.0800	0.300	NE	NE			122405-008	SW846-6020B
	Selenium	ND	0.00150	0.00500	0.050	0.050	U		122405-008	SW846-6020B
	Silver	ND	0.000300	0.00100	NE	0.050	U		122405-008	SW846-6020B
	Sodium	14.3	0.0800	0.250	NE	NE			122405-008	SW846-6020B
	Thallium	ND	0.000600	0.00200	0.002	0.002	U		122405-008	SW846-6020B
	Vanadium	ND	0.00330	0.0200	NE	NE	U		122405-008	SW846-6020B
	Zinc	ND	0.00330	0.0200	NE	NE	U		122405-008	SW846-6020B

See notes at end of tables.

Table 2A-6 (continued)
Summary of Target Analyte List Metals and Total Uranium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
Greystone-MW2	Aluminum	ND	0.0193	0.0500	NE	NE	U		122399-008	SW846-6020B
08-May-24	Antimony	ND	0.00100	0.00300	0.006	0.006	U		122399-008	SW846-6020B
	Arsenic	0.00420	0.00200	0.00500	0.010	0.010	J		122399-008	SW846-6020B
	Barium	0.140	0.000670	0.00400	2.00	2.00			122399-008	SW846-6020B
	Beryllium	ND	0.000200	0.000500	0.004	0.004	U		122399-008	SW846-6020B
	Cadmium	ND	0.000300	0.00100	0.005	0.005	U		122399-008	SW846-6020B
	Calcium	149	0.800	2.00	NE	NE			122399-008	SW846-6020B
	Chromium	ND	0.00300	0.0100	0.100	0.050	U		122399-008	SW846-6020B
	Cobalt	0.000404	0.000300	0.00100	NE	NE	J		122399-008	SW846-6020B
	Copper	ND	0.000300	0.00200	1.30	NE	U		122399-008	SW846-6020B
	Iron	ND	0.0330	0.100	NE	NE	U		122399-008	SW846-6020B
	Lead	ND	0.000500	0.00200	0.010	0.015	U		122399-008	SW846-6020B
	Magnesium	29.3	0.0100	0.0300	NE	NE			122399-008	SW846-6020B
	Manganese	ND	0.00100	0.00500	NE	NE	U		122399-008	SW846-6020B
	Mercury	ND	0.0000670	0.000200	0.002	0.002	U		122399-008	SW846-7470A
	Nickel	ND	0.000600	0.00200	NE	NE	U		122399-008	SW846-6020B
	Potassium	5.46	0.0800	0.300	NE	NE			122399-008	SW846-6020B
	Selenium	0.00170	0.00150	0.00500	0.050	0.050	J		122399-008	SW846-6020B
	Silver	ND	0.000300	0.00100	NE	0.050	U		122399-008	SW846-6020B
	Sodium	97.8	0.800	2.50	NE	NE			122399-008	SW846-6020B
	Thallium	ND	0.000600	0.00200	0.002	0.002	U		122399-008	SW846-6020B
	Vanadium	0.00452	0.00330	0.0200	NE	NE	J		122399-008	SW846-6020B
	Zinc	ND	0.00330	0.0200	NE	NE	U		122399-008	SW846-6020B

See notes at end of tables.

Table 2A-6 (continued)
Summary of Target Analyte List Metals and Total Uranium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
MRN-2	Aluminum	ND	0.0193	0.0500	NE	NE	U		122357-008	SW846-6020B
22-Apr-24	Antimony	ND	0.00100	0.00300	0.006	0.006	U		122357-008	SW846-6020B
	Arsenic	ND	0.00200	0.00500	0.010	0.010	U		122357-008	SW846-6020B
	Barium	0.0566	0.000670	0.00400	2.00	2.00			122357-008	SW846-6020B
	Beryllium	ND	0.000200	0.000500	0.004	0.004	U		122357-008	SW846-6020B
	Cadmium	ND	0.000300	0.00100	0.005	0.005	U		122357-008	SW846-6020B
	Calcium	49.0	0.0800	0.200	NE	NE			122357-008	SW846-6020B
	Chromium	ND	0.00300	0.0100	0.100	0.050	U		122357-008	SW846-6020B
	Cobalt	ND	0.000300	0.00100	NE	NE	U		122357-008	SW846-6020B
	Copper	ND	0.000300	0.00200	1.30	NE	U		122357-008	SW846-6020B
	Iron	ND	0.0330	0.100	NE	NE	U		122357-008	SW846-6020B
	Lead	ND	0.000500	0.00200	0.010	0.015	U		122357-008	SW846-6020B
	Magnesium	15.9	0.0100	0.0300	NE	NE			122357-008	SW846-6020B
	Manganese	ND	0.00100	0.00500	NE	NE	U		122357-008	SW846-6020B
	Mercury	ND	0.0000670	0.000200	0.002	0.002	U		122357-008	SW846-7470A
	Nickel	ND	0.000600	0.00200	NE	NE	U		122357-008	SW846-6020B
	Potassium	3.48	0.0800	0.300	NE	NE			122357-008	SW846-6020B
	Selenium	ND	0.00150	0.00500	0.050	0.050	U		122357-008	SW846-6020B
	Silver	ND	0.000300	0.00100	NE	0.050	U		122357-008	SW846-6020B
	Sodium	25.3	0.0800	0.250	NE	NE			122357-008	SW846-6020B
	Thallium	ND	0.000600	0.00200	0.002	0.002	U		122357-008	SW846-6020B
	Vanadium	0.00302	0.0000670	0.000200	0.03	0.03			122357-008	SW846-6020B
	Zinc	0.00900	0.00330	0.0200	NE	NE	J		122357-008	SW846-6020B

See notes at end of tables.

Table 2A-6 (continued)
Summary of Target Analyte List Metals and Total Uranium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
MRN-3D	Aluminum	ND	0.0193	0.0500	NE	NE	U		122359-008	SW846-6020B
23-Apr-24	Antimony	ND	0.00100	0.00300	0.006	0.006	U		122359-008	SW846-6020B
	Arsenic	ND	0.00200	0.00500	0.010	0.010	U		122359-008	SW846-6020B
	Barium	0.101	0.000670	0.00400	2.00	2.00			122359-008	SW846-6020B
	Beryllium	ND	0.000200	0.000500	0.004	0.004	U		122359-008	SW846-6020B
	Cadmium	ND	0.000300	0.00100	0.005	0.005	U		122359-008	SW846-6020B
	Calcium	58.2	0.800	2.00	NE	NE			122359-008	SW846-6020B
	Chromium	ND	0.00300	0.0100	0.100	0.050	U		122359-008	SW846-6020B
	Cobalt	ND	0.000300	0.00100	NE	NE	U		122359-008	SW846-6020B
	Copper	ND	0.000300	0.00200	1.30	NE	U		122359-008	SW846-6020B
	Iron	ND	0.0330	0.100	NE	NE	U		122359-008	SW846-6020B
	Lead	ND	0.000500	0.00200	0.010	0.015	U		122359-008	SW846-6020B
	Magnesium	14.0	0.0100	0.0300	NE	NE			122359-008	SW846-6020B
	Manganese	ND	0.00100	0.00500	NE	NE	U		122359-008	SW846-6020B
	Mercury	ND	0.0000670	0.000200	0.002	0.002	U		122359-008	SW846-7470A
	Nickel	ND	0.000600	0.00200	NE	NE	U		122359-008	SW846-6020B
	Potassium	4.18	0.0800	0.300	NE	NE			122359-008	SW846-6020B
	Selenium	ND	0.00150	0.00500	0.050	0.050	U		122359-008	SW846-6020B
	Silver	ND	0.000300	0.00100	NE	0.050	U		122359-008	SW846-6020B
	Sodium	27.7	0.0800	0.250	NE	NE			122359-008	SW846-6020B
	Thallium	ND	0.000600	0.00200	0.002	0.002	U		122359-008	SW846-6020B
	Uranium	0.00324	0.0000670	0.000200	0.03	0.03			122359-008	SW846-6020B
	Vanadium	0.00808	0.00330	0.0200	NE	NE	J		122359-008	SW846-6020B
	Zinc	0.0128	0.00330	0.0200	NE	NE	J		122359-008	SW846-6020B

See notes at end of tables.

Table 2A-6 (continued)
Summary of Target Analyte List Metals and Total Uranium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
NWTA3-MW3D	Aluminum	ND	0.0193	0.0500	NE	NE	U		122352-008	SW846-6020B
18-Apr-24	Antimony	ND	0.00100	0.00300	0.006	0.006	U		122352-008	SW846-6020B
	Arsenic	ND	0.00200	0.00500	0.010	0.010	U		122352-008	SW846-6020B
	Barium	0.0905	0.000670	0.00400	2.00	2.00			122352-008	SW846-6020B
	Beryllium	ND	0.000200	0.000500	0.004	0.004	U		122352-008	SW846-6020B
	Cadmium	ND	0.000300	0.00100	0.005	0.005	U		122352-008	SW846-6020B
	Calcium	39.4	0.0800	0.200	NE	NE			122352-008	SW846-6020B
	Chromium	ND	0.00300	0.0100	0.100	0.050	U		122352-008	SW846-6020B
	Cobalt	ND	0.000300	0.00100	NE	NE	U		122352-008	SW846-6020B
	Copper	ND	0.000300	0.00200	1.30	NE	U		122352-008	SW846-6020B
	Iron	ND	0.0330	0.100	NE	NE	U		122352-008	SW846-6020B
	Lead	ND	0.000500	0.00200	0.010	0.015	U		122352-008	SW846-6020B
	Magnesium	8.23	0.0100	0.0300	NE	NE			122352-008	SW846-6020B
	Manganese	ND	0.00100	0.00500	NE	NE	U		122352-008	SW846-6020B
	Mercury	ND	0.0000670	0.000200	0.002	0.002	U		122352-008	SW846-7470A
	Nickel	ND	0.000600	0.00200	NE	NE	U		122352-008	SW846-6020B
	Potassium	3.52	0.0800	0.300	NE	NE			122352-008	SW846-6020B
	Selenium	ND	0.00150	0.00500	0.050	0.050	U		122352-008	SW846-6020B
	Silver	ND	0.000300	0.00100	NE	0.050	U		122352-008	SW846-6020B
	Sodium	37.6	0.0800	0.250	NE	NE			122352-008	SW846-6020B
	Thallium	ND	0.000600	0.00200	0.002	0.002	U		122352-008	SW846-6020B
	Uranium	0.00310	0.0000670	0.000200	0.03	0.03			122352-008	SW846-6020B
	Vanadium	0.00931	0.00330	0.0200	NE	NE	J		122352-008	SW846-6020B
	Zinc	ND	0.00330	0.0200	NE	NE	U		122352-008	SW846-6020B

See notes at end of tables.

Table 2A-6 (continued)
Summary of Target Analyte List Metals and Total Uranium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
NWTA3-MW3D	Aluminum	ND	0.0193	0.0500	NE	NE	U		122353-008	SW846-6020B
(Duplicate)	Antimony	ND	0.00100	0.00300	0.006	0.006	U		122353-008	SW846-6020B
18-Apr-24	Arsenic	ND	0.00200	0.00500	0.010	0.010	U		122353-008	SW846-6020B
	Barium	0.0890	0.000670	0.00400	2.00	2.00			122353-008	SW846-6020B
	Beryllium	ND	0.000200	0.000500	0.004	0.004	U		122353-008	SW846-6020B
	Cadmium	ND	0.000300	0.00100	0.005	0.005	U		122353-008	SW846-6020B
	Calcium	38.7	0.0800	0.200	NE	NE			122353-008	SW846-6020B
	Chromium	ND	0.00300	0.0100	0.100	0.050	U		122353-008	SW846-6020B
	Cobalt	ND	0.000300	0.00100	NE	NE	U		122353-008	SW846-6020B
	Copper	ND	0.000300	0.00200	1.30	NE	U		122353-008	SW846-6020B
	Iron	ND	0.0330	0.100	NE	NE	U		122353-008	SW846-6020B
	Lead	ND	0.000500	0.00200	0.010	0.015	U		122353-008	SW846-6020B
	Magnesium	8.10	0.0100	0.0300	NE	NE			122353-008	SW846-6020B
	Manganese	ND	0.00100	0.00500	NE	NE	U		122353-008	SW846-6020B
	Mercury	ND	0.0000670	0.000200	0.002	0.002	U		122353-008	SW846-7470A
	Nickel	ND	0.000600	0.00200	NE	NE	U		122353-008	SW846-6020B
	Potassium	3.46	0.0800	0.300	NE	NE			122353-008	SW846-6020B
	Selenium	ND	0.00150	0.00500	0.050	0.050	U		122353-008	SW846-6020B
	Silver	ND	0.000300	0.00100	NE	0.050	U		122353-008	SW846-6020B
	Sodium	38.8	0.0800	0.250	NE	NE			122353-008	SW846-6020B
	Thallium	ND	0.000600	0.00200	0.002	0.002	U		122353-008	SW846-6020B
	Uranium	0.00311	0.0000670	0.000200	0.03	0.03			122353-008	SW846-6020B
	Vanadium	0.00913	0.00330	0.0200	NE	NE	J		122353-008	SW846-6020B
	Zinc	ND	0.00330	0.0200	NE	NE	U		122353-008	SW846-6020B

See notes at end of tables.

Table 2A-6 (continued)
Summary of Target Analyte List Metals and Total Uranium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
OBS-MW1	Aluminum	ND	0.0193	0.0500	NE	NE	U		122330-008	SW846-6020B
11-Apr-24	Antimony	ND	0.00100	0.00300	0.006	0.006	U		122330-008	SW846-6020B
	Arsenic	ND	0.00200	0.00500	0.010	0.010	U		122330-008	SW846-6020B
	Barium	0.0204	0.000670	0.00400	2.00	2.00			122330-008	SW846-6020B
	Beryllium	ND	0.000200	0.000500	0.004	0.004	U		122330-008	SW846-6020B
	Cadmium	ND	0.000300	0.00100	0.005	0.005	U		122330-008	SW846-6020B
	Calcium	79.1	0.800	2.00	NE	NE			122330-008	SW846-6020B
	Chromium	ND	0.00300	0.0100	0.100	0.050	U		122330-008	SW846-6020B
	Cobalt	ND	0.000300	0.00100	NE	NE	U		122330-008	SW846-6020B
	Copper	ND	0.000300	0.00200	1.30	NE	U		122330-008	SW846-6020B
	Iron	0.0641	0.0330	0.100	NE	NE	J		122330-008	SW846-6020B
	Lead	ND	0.000500	0.00200	0.010	0.015	U		122330-008	SW846-6020B
	Magnesium	16.9	0.0100	0.0300	NE	NE	B		122330-008	SW846-6020B
	Manganese	0.00212	0.00100	0.00500	NE	NE	J	J	122330-008	SW846-6020B
	Mercury	ND	0.0000670	0.000200	0.002	0.002	U		122330-008	SW846-7470A
	Nickel	0.00314	0.000600	0.00200	NE	NE			122330-008	SW846-6020B
	Potassium	1.78	0.0800	0.300	NE	NE			122330-008	SW846-6020B
	Selenium	0.00316	0.00150	0.00500	0.050	0.050	J		122330-008	SW846-6020B
	Silver	ND	0.000300	0.00100	NE	0.050	U		122330-008	SW846-6020B
	Sodium	23.7	0.0800	0.250	NE	NE			122330-008	SW846-6020B
	Thallium	ND	0.000600	0.00200	0.002	0.002	U		122330-008	SW846-6020B
	Vanadium	0.00434	0.00330	0.0200	NE	NE	J		122330-008	SW846-6020B
	Zinc	0.0131	0.00330	0.0200	NE	NE	J		122330-008	SW846-6020B

See notes at end of tables.

Table 2A-6 (continued)
Summary of Target Analyte List Metals and Total Uranium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
PL-2	Aluminum	ND	0.0193	0.0500	NE	NE	U		122367-008	SW846-6020B
24-Apr-24	Antimony	0.00143	0.00100	0.00300	0.006	0.006	J		122367-008	SW846-6020B
	Arsenic	ND	0.00200	0.00500	0.010	0.010	U		122367-008	SW846-6020B
	Barium	0.0706	0.000670	0.00400	2.00	2.00			122367-008	SW846-6020B
	Beryllium	ND	0.000200	0.000500	0.004	0.004	U		122367-008	SW846-6020B
	Cadmium	ND	0.000300	0.00100	0.005	0.005	U		122367-008	SW846-6020B
	Calcium	58.7	0.800	2.00	NE	NE			122367-008	SW846-6020B
	Chromium	0.00369	0.00300	0.0100	0.100	0.050	J		122367-008	SW846-6020B
	Cobalt	ND	0.000300	0.00100	NE	NE	U		122367-008	SW846-6020B
	Copper	0.00136	0.000300	0.00200	1.30	NE	J		122367-008	SW846-6020B
	Iron	ND	0.0330	0.100	NE	NE	U		122367-008	SW846-6020B
	Lead	ND	0.000500	0.00200	0.010	0.015	U		122367-008	SW846-6020B
	Magnesium	10.1	0.0100	0.0300	NE	NE			122367-008	SW846-6020B
	Manganese	ND	0.00100	0.00500	NE	NE	U		122367-008	SW846-6020B
	Mercury	ND	0.0000670	0.000200	0.002	0.002	U		122367-008	SW846-7470A
	Nickel	0.00494	0.000600	0.00200	NE	NE			122367-008	SW846-6020B
	Potassium	3.73	0.0800	0.300	NE	NE			122367-008	SW846-6020B
	Selenium	ND	0.00150	0.00500	0.050	0.050	U		122367-008	SW846-6020B
	Silver	ND	0.000300	0.00100	NE	0.050	U		122367-008	SW846-6020B
	Sodium	29.8	0.0800	0.250	NE	NE			122367-008	SW846-6020B
	Thallium	ND	0.000600	0.00200	0.002	0.002	U		122367-008	SW846-6020B
	Uranium	0.00338	0.0000670	0.000200	0.03	0.03			122367-008	SW846-6020B
	Vanadium	0.00737	0.00330	0.0200	NE	NE	J		122367-008	SW846-6020B
	Zinc	0.0126	0.00330	0.0200	NE	NE	J		122367-008	SW846-6020B

See notes at end of tables.

Table 2A-6 (continued)
Summary of Target Analyte List Metals and Total Uranium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
PL-4	Aluminum	ND	0.0193	0.0500	NE	NE	U		122371-008	SW846-6020B
25-Apr-24	Antimony	ND	0.00100	0.00300	0.006	0.006	U		122371-008	SW846-6020B
	Arsenic	ND	0.00200	0.00500	0.010	0.010	U		122371-008	SW846-6020B
	Barium	0.0722	0.000670	0.00400	2.00	2.00			122371-008	SW846-6020B
	Beryllium	ND	0.000200	0.000500	0.004	0.004	U		122371-008	SW846-6020B
	Cadmium	ND	0.000300	0.00100	0.005	0.005	U		122371-008	SW846-6020B
	Calcium	66.6	0.800	2.00	NE	NE			122371-008	SW846-6020B
	Chromium	ND	0.00300	0.0100	0.100	0.050	U		122371-008	SW846-6020B
	Cobalt	ND	0.000300	0.00100	NE	NE	U		122371-008	SW846-6020B
	Copper	ND	0.000300	0.00200	1.30	NE	U		122371-008	SW846-6020B
	Iron	ND	0.0330	0.100	NE	NE	U		122371-008	SW846-6020B
	Lead	ND	0.000500	0.00200	0.010	0.015	U		122371-008	SW846-6020B
	Magnesium	13.3	0.0100	0.0300	NE	NE			122371-008	SW846-6020B
	Manganese	ND	0.00100	0.00500	NE	NE	U		122371-008	SW846-6020B
	Mercury	ND	0.0000670	0.000200	0.002	0.002	U		122371-008	SW846-7470A
	Nickel	ND	0.000600	0.00200	NE	NE	U		122371-008	SW846-6020B
	Potassium	5.11	0.0800	0.300	NE	NE			122371-008	SW846-6020B
	Selenium	0.00186	0.00150	0.00500	0.050	0.050	J		122371-008	SW846-6020B
	Silver	ND	0.000300	0.00100	NE	0.050	U		122371-008	SW846-6020B
	Sodium	26.5	0.0800	0.250	NE	NE			122371-008	SW846-6020B
	Thallium	ND	0.000600	0.00200	0.002	0.002	U		122371-008	SW846-6020B
	Uranium	0.00350	0.0000670	0.000200	0.03	0.03			122371-008	SW846-6020B
	Vanadium	0.00570	0.00330	0.0200	NE	NE	J		122371-008	SW846-6020B
	Zinc	ND	0.00330	0.0200	NE	NE	U		122371-008	SW846-6020B

See notes at end of tables.

Table 2A-6 (continued)
Summary of Target Analyte List Metals and Total Uranium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
SFR-2S	Aluminum	ND	0.0193	0.0500	NE	NE	U		122377-009	SW846-6020B
30-Apr-24	Antimony	ND	0.00100	0.00300	0.006	0.006	U		122377-009	SW846-6020B
	Arsenic	ND	0.00200	0.00500	0.010	0.010	U		122377-009	SW846-6020B
	Barium	0.0565	0.000670	0.00400	2.00	2.00			122377-009	SW846-6020B
	Beryllium	ND	0.000200	0.000500	0.004	0.004	U		122377-009	SW846-6020B
	Cadmium	ND	0.000300	0.00100	0.005	0.005	U		122377-009	SW846-6020B
	Calcium	126	0.800	2.00	NE	NE			122377-009	SW846-6020B
	Chromium	0.0122	0.00300	0.0100	0.100	0.050			122377-009	SW846-6020B
	Cobalt	ND	0.000300	0.00100	NE	NE	U		122377-009	SW846-6020B
	Copper	0.00273	0.000300	0.00200	1.30	NE		J+	122377-009	SW846-6020B
	Iron	0.0753	0.0330	0.100	NE	NE	J		122377-009	SW846-6020B
	Lead	ND	0.000500	0.00200	0.010	0.015	U		122377-009	SW846-6020B
	Magnesium	38.2	0.0100	0.0300	NE	NE			122377-009	SW846-6020B
	Manganese	0.00233	0.00100	0.00500	NE	NE	J	J+	122377-009	SW846-6020B
	Mercury	ND	0.0000670	0.000200	0.002	0.002	U		122377-009	SW846-7470A
	Nickel	0.00620	0.000600	0.00200	NE	NE			122377-009	SW846-6020B
	Potassium	7.83	0.0800	0.300	NE	NE			122377-009	SW846-6020B
	Selenium	0.00181	0.00150	0.00500	0.050	0.050	J		122377-009	SW846-6020B
	Silver	ND	0.000300	0.00100	NE	0.050	U		122377-009	SW846-6020B
	Sodium	89.0	0.800	2.50	NE	NE			122377-009	SW846-6020B
	Thallium	ND	0.000600	0.00200	0.002	0.002	U		122377-009	SW846-6020B
	Vanadium	0.00539	0.00330	0.0200	NE	NE	J		122377-009	SW846-6020B
	Zinc	ND	0.00330	0.0200	NE	NE	U		122377-009	SW846-6020B

See notes at end of tables.

Table 2A-6 (continued)
Summary of Target Analyte List Metals and Total Uranium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
SFR-2S	Aluminum	ND	0.0193	0.0500	NE	NE	U		122378-009	SW846-6020B
(Duplicate)	Antimony	ND	0.00100	0.00300	0.006	0.006	U		122378-009	SW846-6020B
30-Apr-24	Arsenic	ND	0.00200	0.00500	0.010	0.010	U		122378-009	SW846-6020B
	Barium	0.0567	0.000670	0.00400	2.00	2.00			122378-009	SW846-6020B
	Beryllium	ND	0.000200	0.000500	0.004	0.004	U		122378-009	SW846-6020B
	Cadmium	ND	0.000300	0.00100	0.005	0.005	U		122378-009	SW846-6020B
	Calcium	129	0.800	2.00	NE	NE			122378-009	SW846-6020B
	Chromium	0.0145	0.00300	0.0100	0.100	0.050			122378-009	SW846-6020B
	Cobalt	ND	0.000300	0.00100	NE	NE	U		122378-009	SW846-6020B
	Copper	0.00289	0.000300	0.00200	1.30	NE			122378-009	SW846-6020B
	Iron	0.0783	0.0330	0.100	NE	NE	J		122378-009	SW846-6020B
	Lead	ND	0.000500	0.00200	0.010	0.015	U		122378-009	SW846-6020B
	Magnesium	38.0	0.0100	0.0300	NE	NE			122378-009	SW846-6020B
	Manganese	0.00215	0.00100	0.00500	NE	NE	J	J+	122378-009	SW846-6020B
	Mercury	ND	0.0000670	0.000200	0.002	0.002	U		122378-009	SW846-7470A
	Nickel	0.00600	0.000600	0.00200	NE	NE			122378-009	SW846-6020B
	Potassium	7.80	0.0800	0.300	NE	NE			122378-009	SW846-6020B
	Selenium	0.00175	0.00150	0.00500	0.050	0.050	J		122378-009	SW846-6020B
	Silver	ND	0.000300	0.00100	NE	0.050	U		122378-009	SW846-6020B
	Sodium	91.3	0.800	2.50	NE	NE			122378-009	SW846-6020B
	Thallium	ND	0.000600	0.00200	0.002	0.002	U		122378-009	SW846-6020B
	Vanadium	0.00558	0.00330	0.0200	NE	NE	J		122378-009	SW846-6020B
	Zinc	0.00347	0.00330	0.0200	NE	NE	J		122378-009	SW846-6020B

See notes at end of tables.

Table 2A-6 (continued)
Summary of Target Analyte List Metals and Total Uranium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
SFR-4T	Aluminum	ND	0.0193	0.0500	NE	NE	U		122384-009	SW846-6020B
29-Apr-24	Antimony	0.00111	0.00100	0.00300	0.006	0.006	J		122384-009	SW846-6020B
	Arsenic	ND	0.0100	0.0250	0.010	0.010	U		122384-009	SW846-6020B
	Barium	0.00822	0.000670	0.00400	2.00	2.00			122384-009	SW846-6020B
	Beryllium	ND	0.000200	0.000500	0.004	0.004	U		122384-009	SW846-6020B
	Cadmium	ND	0.000300	0.00100	0.005	0.005	U		122384-009	SW846-6020B
	Calcium	60.7	0.400	1.00	NE	NE			122384-009	SW846-6020B
	Chromium	ND	0.00300	0.0100	0.100	0.050	U		122384-009	SW846-6020B
	Cobalt	ND	0.000300	0.00100	NE	NE	U		122384-009	SW846-6020B
	Copper	0.00606	0.000300	0.00200	1.30	NE			122384-009	SW846-6020B
	Iron	ND	0.0330	0.100	NE	NE	U		122384-009	SW846-6020B
	Lead	ND	0.000500	0.00200	0.010	0.015	U		122384-009	SW846-6020B
	Magnesium	3.29	0.0100	0.0300	NE	NE			122384-009	SW846-6020B
	Manganese	ND	0.00100	0.00500	NE	NE	U		122384-009	SW846-6020B
	Mercury	ND	0.0000670	0.000200	0.002	0.002	U		122384-009	SW846-7470A
	Nickel	0.000932	0.000600	0.00200	NE	NE	J		122384-009	SW846-6020B
	Potassium	2.26	0.0800	0.300	NE	NE			122384-009	SW846-6020B
	Selenium	ND	0.00750	0.0250	0.050	0.050	U		122384-009	SW846-6020B
	Silver	ND	0.000300	0.00100	NE	0.050	U		122384-009	SW846-6020B
	Sodium	1090	8.00	25.0	NE	NE			122384-009	SW846-6020B
	Thallium	ND	0.000600	0.00200	0.002	0.002	U		122384-009	SW846-6020B
	Vanadium	ND	0.00330	0.0200	NE	NE	U		122384-009	SW846-6020B
	Zinc	0.0214	0.0165	0.100	NE	NE	J		122384-009	SW846-6020B

See notes at end of tables.

Table 2A-6 (continued)
Summary of Target Analyte List Metals and Total Uranium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
SWTA3-MW2	Aluminum	ND	0.0193	0.0500	NE	NE	U		122340-009	SW846-6020B
16-Apr-24	Antimony	ND	0.00100	0.00300	0.006	0.006	U		122340-009	SW846-6020B
	Arsenic	ND	0.00200	0.00500	0.010	0.010	U		122340-009	SW846-6020B
	Barium	0.0756	0.000670	0.00400	2.00	2.00			122340-009	SW846-6020B
	Beryllium	ND	0.000200	0.000500	0.004	0.004	U		122340-009	SW846-6020B
	Cadmium	ND	0.000300	0.00100	0.005	0.005	U		122340-009	SW846-6020B
	Calcium	47.0	0.0800	0.200	NE	NE			122340-009	SW846-6020B
	Chromium	ND	0.00300	0.0100	0.100	0.050	U		122340-009	SW846-6020B
	Cobalt	ND	0.000300	0.00100	NE	NE	U		122340-009	SW846-6020B
	Copper	ND	0.000300	0.00200	1.30	NE	U		122340-009	SW846-6020B
	Iron	0.0386	0.0330	0.100	NE	NE	J		122340-009	SW846-6020B
	Lead	ND	0.000500	0.00200	0.010	0.015	U		122340-009	SW846-6020B
	Magnesium	13.9	0.0100	0.0300	NE	NE			122340-009	SW846-6020B
	Manganese	ND	0.00100	0.00500	NE	NE	U		122340-009	SW846-6020B
	Mercury	ND	0.0000670	0.000200	0.002	0.002	U		122340-009	SW846-7470A
	Nickel	ND	0.000600	0.00200	NE	NE	U		122340-009	SW846-6020B
	Potassium	4.28	0.0800	0.300	NE	NE			122340-009	SW846-6020B
	Selenium	ND	0.00150	0.00500	0.050	0.050	U		122340-009	SW846-6020B
	Silver	ND	0.000300	0.00100	NE	0.050	U		122340-009	SW846-6020B
	Sodium	39.5	0.0800	0.250	NE	NE			122340-009	SW846-6020B
	Thallium	ND	0.000600	0.00200	0.002	0.002	U		122340-009	SW846-6020B
	Uranium	0.00324	0.0000670	0.000200	0.03	0.03			122340-009	SW846-6020B
	Vanadium	0.00814	0.00330	0.0200	NE	NE	J		122340-009	SW846-6020B
	Zinc	ND	0.00330	0.0200	NE	NE	U		122340-009	SW846-6020B

See notes at end of tables.

Table 2A-6 (continued)
Summary of Target Analyte List Metals and Total Uranium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
SWTA3-MW2	Aluminum	ND	0.0193	0.0500	NE	NE	U		122341-009	SW846-6020B
(Duplicate)	Antimony	ND	0.00100	0.00300	0.006	0.006	U		122341-009	SW846-6020B
16-Apr-24	Arsenic	ND	0.00200	0.00500	0.010	0.010	U		122341-009	SW846-6020B
	Barium	0.0733	0.000670	0.00400	2.00	2.00			122341-009	SW846-6020B
	Beryllium	ND	0.000200	0.000500	0.004	0.004	U		122341-009	SW846-6020B
	Cadmium	ND	0.000300	0.00100	0.005	0.005	U		122341-009	SW846-6020B
	Calcium	45.6	0.0800	0.200	NE	NE			122341-009	SW846-6020B
	Chromium	ND	0.00300	0.0100	0.100	0.050	U		122341-009	SW846-6020B
	Cobalt	ND	0.000300	0.00100	NE	NE	U		122341-009	SW846-6020B
	Copper	ND	0.000300	0.00200	1.30	NE	U		122341-009	SW846-6020B
	Iron	0.0376	0.0330	0.100	NE	NE	J		122341-009	SW846-6020B
	Lead	ND	0.000500	0.00200	0.010	0.015	U		122341-009	SW846-6020B
	Magnesium	13.6	0.0100	0.0300	NE	NE			122341-009	SW846-6020B
	Manganese	ND	0.00100	0.00500	NE	NE	U		122341-009	SW846-6020B
	Mercury	ND	0.0000670	0.000200	0.002	0.002	U		122341-009	SW846-7470A
	Nickel	ND	0.000600	0.00200	NE	NE	U		122341-009	SW846-6020B
	Potassium	4.19	0.0800	0.300	NE	NE			122341-009	SW846-6020B
	Selenium	ND	0.00150	0.00500	0.050	0.050	U		122341-009	SW846-6020B
	Silver	ND	0.000300	0.00100	NE	0.050	U		122341-009	SW846-6020B
	Sodium	38.7	0.0800	0.250	NE	NE			122341-009	SW846-6020B
	Thallium	ND	0.000600	0.00200	0.002	0.002	U		122341-009	SW846-6020B
	Uranium	0.00317	0.0000670	0.000200	0.03	0.03			122341-009	SW846-6020B
	Vanadium	0.00830	0.00330	0.0200	NE	NE	J		122341-009	SW846-6020B
	Zinc	ND	0.00330	0.0200	NE	NE	U		122341-009	SW846-6020B

See notes at end of tables.

Table 2A-6 (continued)
Summary of Target Analyte List Metals and Total Uranium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
SWTA3-MW3	Aluminum	ND	0.0193	0.0500	NE	NE	U		122336-009	SW846-6020B
15-Apr-24	Antimony	ND	0.00100	0.00300	0.006	0.006	U		122336-009	SW846-6020B
	Arsenic	ND	0.00200	0.00500	0.010	0.010	U		122336-009	SW846-6020B
	Barium	0.0599	0.000670	0.00400	2.00	2.00			122336-009	SW846-6020B
	Beryllium	ND	0.000200	0.000500	0.004	0.004	U		122336-009	SW846-6020B
	Cadmium	ND	0.000300	0.00100	0.005	0.005	U		122336-009	SW846-6020B
	Calcium	39.7	0.0800	0.200	NE	NE			122336-009	SW846-6020B
	Chromium	ND	0.00300	0.0100	0.100	0.050	U		122336-009	SW846-6020B
	Cobalt	ND	0.000300	0.00100	NE	NE	U		122336-009	SW846-6020B
	Copper	ND	0.000300	0.00200	1.30	NE	U		122336-009	SW846-6020B
	Iron	0.0339	0.0330	0.100	NE	NE	J		122336-009	SW846-6020B
	Lead	ND	0.000500	0.00200	0.010	0.015	U		122336-009	SW846-6020B
	Magnesium	11.2	0.0100	0.0300	NE	NE			122336-009	SW846-6020B
	Manganese	ND	0.00100	0.00500	NE	NE	U		122336-009	SW846-6020B
	Mercury	ND	0.0000670	0.000200	0.002	0.002	U		122336-009	SW846-7470A
	Nickel	ND	0.000600	0.00200	NE	NE	U		122336-009	SW846-6020B
	Potassium	4.73	0.0800	0.300	NE	NE			122336-009	SW846-6020B
	Selenium	ND	0.00150	0.00500	0.050	0.050	U		122336-009	SW846-6020B
	Silver	ND	0.000300	0.00100	NE	0.050	U		122336-009	SW846-6020B
	Sodium	50.2	0.800	2.50	NE	NE			122336-009	SW846-6020B
	Thallium	ND	0.000600	0.00200	0.002	0.002	U		122336-009	SW846-6020B
	Uranium	0.00251	0.0000670	0.000200	0.03	0.03			122336-009	SW846-6020B
	Vanadium	0.00926	0.00330	0.0200	NE	NE	J		122336-009	SW846-6020B
	Zinc	ND	0.00330	0.0200	NE	NE	U		122336-009	SW846-6020B

See notes at end of tables.

Table 2A-6 (continued)
Summary of Target Analyte List Metals and Total Uranium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
SWTA3-MW4	Aluminum	ND	0.0193	0.0500	NE	NE	U		122346-009	SW846-6020B
17-Apr-24	Antimony	ND	0.00100	0.00300	0.006	0.006	U		122346-009	SW846-6020B
	Arsenic	ND	0.00200	0.00500	0.010	0.010	U		122346-009	SW846-6020B
	Barium	0.0528	0.000670	0.00400	2.00	2.00			122346-009	SW846-6020B
	Beryllium	ND	0.000200	0.000500	0.004	0.004	U		122346-009	SW846-6020B
	Cadmium	ND	0.000300	0.00100	0.005	0.005	U		122346-009	SW846-6020B
	Calcium	36.6	0.0800	0.200	NE	NE			122346-009	SW846-6020B
	Chromium	ND	0.00300	0.0100	0.100	0.050	U		122346-009	SW846-6020B
	Cobalt	ND	0.000300	0.00100	NE	NE	U		122346-009	SW846-6020B
	Copper	ND	0.000300	0.00200	1.30	NE	U		122346-009	SW846-6020B
	Iron	ND	0.0330	0.100	NE	NE	U		122346-009	SW846-6020B
	Lead	ND	0.000500	0.00200	0.010	0.015	U		122346-009	SW846-6020B
	Magnesium	10.6	0.0100	0.0300	NE	NE			122346-009	SW846-6020B
	Manganese	ND	0.00100	0.00500	NE	NE	U		122346-009	SW846-6020B
	Mercury	ND	0.0000670	0.000200	0.002	0.002	U		122346-009	SW846-7470A
	Nickel	ND	0.000600	0.00200	NE	NE	U		122346-009	SW846-6020B
	Potassium	4.27	0.0800	0.300	NE	NE			122346-009	SW846-6020B
	Selenium	ND	0.00150	0.00500	0.050	0.050	U		122346-009	SW846-6020B
	Silver	ND	0.000300	0.00100	NE	0.050	U		122346-009	SW846-6020B
	Sodium	60.0	0.800	2.50	NE	NE			122346-009	SW846-6020B
	Thallium	ND	0.000600	0.00200	0.002	0.002	U		122346-009	SW846-6020B
	Uranium	0.00212	0.0000670	0.000200	0.03	0.03			122346-009	SW846-6020B
	Vanadium	0.0101	0.00330	0.0200	NE	NE	J		122346-009	SW846-6020B
	Zinc	ND	0.00330	0.0200	NE	NE	U		122346-009	SW846-6020B

See notes at end of tables.

Table 2A-6 (concluded)
Summary of Target Analyte List Metals and Total Uranium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL / MAC[d] (mg/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TRE-1	Aluminum	ND	0.0193	0.0500	NE	NE	U		122386-009	SW846-6020B
01-May-24	Antimony	ND	0.00100	0.00300	0.006	0.006	U		122386-009	SW846-6020B
	Arsenic	0.00226	0.00200	0.00500	0.010	0.010	J		122386-009	SW846-6020B
	Barium	0.0440	0.000670	0.00400	2.00	2.00			122386-009	SW846-6020B
	Beryllium	0.000216	0.000200	0.000500	0.004	0.004	J		122386-009	SW846-6020B
	Cadmium	ND	0.000300	0.00100	0.005	0.005	U		122386-009	SW846-6020B
	Calcium	173	0.800	2.00	NE	NE			122386-009	SW846-6020B
	Chromium	ND	0.00300	0.0100	0.100	0.050	U		122386-009	SW846-6020B
	Cobalt	ND	0.000300	0.00100	NE	NE	U		122386-009	SW846-6020B
	Copper	ND	0.000300	0.00200	1.30	NE	U		122386-009	SW846-6020B
	Iron	ND	0.0330	0.100	NE	NE	U		122386-009	SW846-6020B
	Lead	ND	0.000500	0.00200	0.010	0.015	U		122386-009	SW846-6020B
	Magnesium	39.3	0.0100	0.0300	NE	NE			122386-009	SW846-6020B
	Manganese	ND	0.00100	0.00500	NE	NE	U		122386-009	SW846-6020B
	Mercury	ND	0.0000670	0.000200	0.002	0.002	U		122386-009	SW846-7470A
	Nickel	ND	0.000600	0.00200	NE	NE	U		122386-009	SW846-6020B
	Potassium	7.21	0.0800	0.300	NE	NE			122386-009	SW846-6020B
	Selenium	0.00230	0.00150	0.00500	0.050	0.050	J		122386-009	SW846-6020B
	Silver	ND	0.000300	0.00100	NE	0.050	U		122386-009	SW846-6020B
	Sodium	118	0.800	2.50	NE	NE			122386-009	SW846-6020B
	Thallium	ND	0.000600	0.00200	0.002	0.002	U		122386-009	SW846-6020B
	Vanadium	0.00513	0.00330	0.0200	NE	NE	J		122386-009	SW846-6020B
	Zinc	ND	0.00330	0.0200	NE	NE	U		122386-009	SW846-6020B

See notes at end of tables.

Table 2A-7
Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, Isotopic Uranium, and Radium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Activity[a] (pCi/L)	MDA[b] (pCi/L)	Critical Level[c] (pCi/L)	MCL / MAC[d]		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
Coyote Springs	Americium-241	-2.09 ± 3.26	5.24	2.54	NE	NE	U	BD	122324-010	EPA 901.1
10-Apr-24	Cesium-137	-2.01 ± 4.27	5.13	2.42	NE	NE	U	BD	122324-010	EPA 901.1
	Cobalt-60	-1.15 ± 3.10	5.23	2.37	NE	NE	U	BD	122324-010	EPA 901.1
	Potassium-40	48.8 ± 72.2	51.0	23.0	NE	NE	U	BD	122324-010	EPA 901.1
	Gross Alpha	-4.59	NA	NA	15 pCi/L	NE	NA	None	122324-011	EPA 900.0/SW846-9310
	Gross Beta	30.4 ± 5.06	6.64	3.21	4 mrem/yr	NE			122324-011	EPA 900.0/SW846-9310
	Uranium-233/234	11.0 ± 1.10	0.0768	0.0343	NE	NE			122324-014	HASL-300
	Uranium-235/236	0.211 ± 0.0632	0.0681	0.0289	NE	NE			122324-014	HASL-300
	Uranium-238	2.41 ± 0.283	0.0592	0.0255	NE	NE			122324-014	HASL-300
	Radium-226	0.417 ± 0.402	0.586	0.210	5 pCi/L	5 pCi/L	U	BD	122324-012	EPA 903.1M
	Radium-228	1.04 ± 0.608	0.833	0.383	5 pCi/L	5 pCi/L		J	122324-013	EPA 904.0/SW846-9320M
CCBA-MW2	Americium-241	-8.31 ± 12.7	21.2	10.3	NE	NE	U	BD	122388-010	EPA 901.1
02-May-24	Cesium-137	1.20 ± 6.34	3.59	1.68	NE	NE	U	BD	122388-010	EPA 901.1
	Cobalt-60	0.185 ± 2.23	4.22	1.94	NE	NE	U	BD	122388-010	EPA 901.1
	Potassium-40	-14.2 ± 43.4	58.2	27.4	NE	NE	U	BD	122388-010	EPA 901.1
	Gross Alpha	-1.05	NA	NA	15 pCi/L	NE	NA	None	122388-011	EPA 900.0/SW846-9310
	Gross Beta	2.15 ± 0.831	1.29	0.625	4 mrem/yr	NE	*	J	122388-011	EPA 900.0/SW846-9310
	Uranium-233/234	6.41 ± 0.759	0.108	0.0474	NE	NE			122388-014	HASL-300
	Uranium-235/236	0.213 ± 0.0755	0.0963	0.0400	NE	NE		J	122388-014	HASL-300
	Uranium-238	1.46 ± 0.226	0.0836	0.0352	NE	NE			122388-014	HASL-300
	Radium-226	3.83 ± 1.15	0.397	0.123	5 pCi/L	5 pCi/L			122388-012	EPA 903.1M
	Radium-228	0.646 ± 0.392	0.504	0.216	5 pCi/L	5 pCi/L		J	122388-013	EPA 904.0/SW846-9320M
CTF-MW1	Americium-241	0.864 ± 8.10	13.6	6.60	NE	NE	U	BD	122396-010	EPA 901.1
06-May-24	Cesium-137	0.579 ± 1.75	3.03	1.44	NE	NE	U	BD	122396-010	EPA 901.1
	Cobalt-60	0.621 ± 1.90	3.42	1.59	NE	NE	U	BD	122396-010	EPA 901.1
	Potassium-40	16.6 ± 55.1	31.4	14.5	NE	NE	U	BD	122396-010	EPA 901.1
	Gross Alpha	0.24	NA	NA	15 pCi/L	NE	NA	None	122396-011	EPA 900.0/SW846-9310
	Gross Beta	6.10 ± 0.901	1.13	0.541	4 mrem/yr	NE			122396-011	EPA 900.0/SW846-9310
	Uranium-233/234	23.0 ± 2.46	0.0998	0.0438	NE	NE			122396-014	HASL-300
	Uranium-235/236	0.347 ± 0.0954	0.0891	0.0370	NE	NE			122396-014	HASL-300
	Uranium-238	3.61 ± 0.448	0.0773	0.0326	NE	NE			122396-014	HASL-300
	Radium-226	2.23 ± 0.763	0.335	0.102	5 pCi/L	5 pCi/L			122396-012	EPA 903.1M
	Radium-228	0.495 ± 0.437	0.678	0.307	5 pCi/L	5 pCi/L	U	BD	122396-013	EPA 904.0/SW846-9320M

See notes at end of tables.

Table 2A-7 (continued)
Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, Isotopic Uranium, and Radium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Activity[a] (pCi/L)	MDA[b] (pCi/L)	Critical Level[c] (pCi/L)	MCL / MAC[d]		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CTF-MW1 (Duplicate)	Americium-241	-1.06 ± 6.50	10.4	5.04	NE	NE	U	BD	122397-010	EPA 901.1
06-May-24	Cesium-137	1.34 ± 1.57	2.67	1.27	NE	NE	U	BD	122397-010	EPA 901.1
	Cobalt-60	0.172 ± 1.60	2.92	1.35	NE	NE	U	BD	122397-010	EPA 901.1
	Potassium-40	-54.4 ± 50.0	41.2	19.5	NE	NE	U	BD	122397-010	EPA 901.1
	Gross Alpha	-7.19	NA	NA	15 pCi/L	NE	NA	None	122397-011	EPA 900.0/SW846-9310
	Gross Beta	4.90 ± 0.877	1.17	0.563	4 mrem/yr	NE			122397-011	EPA 900.0/SW846-9310
	Uranium-233/234	24.1 ± 2.52	0.0956	0.0420	NE	NE			122397-014	HASL-300
	Uranium-235/236	0.559 ± 0.122	0.0854	0.0355	NE	NE			122397-014	HASL-300
	Uranium-238	3.63 ± 0.442	0.0741	0.0312	NE	NE			122397-014	HASL-300
	Radium-226	0.780 ± 0.526	0.702	0.278	5 pCi/L	5 pCi/L		J	122397-012	EPA 903.1M
	Radium-228	0.251 ± 0.299	0.492	0.222	5 pCi/L	5 pCi/L	U	BD	122397-013	EPA 904.0/SW846-9320M
CYN-MW5	Americium-241	-0.370 ± 10.5	17.9	8.67	NE	NE	U	BD	122405-010	EPA 901.1
07-May-24	Cesium-137	-3.01 ± 3.59	2.78	1.32	NE	NE	U	BD	122405-010	EPA 901.1
	Cobalt-60	-0.415 ± 1.95	3.34	1.55	NE	NE	U	BD	122405-010	EPA 901.1
	Potassium-40	-28.9 ± 44.3	45.0	21.3	NE	NE	U	BD	122405-010	EPA 901.1
	Gross Alpha	0.83	NA	NA	15 pCi/L	NE	NA	None	122405-011	EPA 900.0/SW846-9310
	Gross Beta	3.31 ± 0.570	0.773	0.372	4 mrem/yr	NE			122405-011	EPA 900.0/SW846-9310
	Uranium-233/234	0.843 ± 0.166	0.126	0.0555	NE	NE			122405-014	HASL-300
	Uranium-235/236	0.0316 ± 0.0354	0.113	0.0469	NE	NE	U	BD	122405-014	HASL-300
	Uranium-238	0.205 ± 0.0743	0.0979	0.0412	NE	NE		J	122405-014	HASL-300
	Radium-226	2.43 ± 0.820	0.553	0.209	5 pCi/L	5 pCi/L			122405-012	EPA 903.1M
	Radium-228	0.858 ± 0.426	0.480	0.207	5 pCi/L	5 pCi/L		J	122405-013	EPA 904.0/SW846-9320M
Greystone-MW2	Americium-241	-4.15 ± 16.1	23.4	11.4	NE	NE	U	BD	122399-010	EPA 901.1
08-May-24	Cesium-137	0.829 ± 1.96	3.38	1.62	NE	NE	U	BD	122399-010	EPA 901.1
	Cobalt-60	-1.69 ± 2.35	3.20	1.50	NE	NE	U	BD	122399-010	EPA 901.1
	Potassium-40	-14.6 ± 34.6	41.3	19.6	NE	NE	U	BD	122399-010	EPA 901.1
	Gross Alpha	-3.01	NA	NA	15 pCi/L	NE	NA	None	122399-011	EPA 900.0/SW846-9310
	Gross Beta	7.18 ± 1.49	2.10	1.01	4 mrem/yr	NE			122399-011	EPA 900.0/SW846-9310
	Uranium-233/234	9.40 ± 1.10	0.118	0.0519	NE	NE			122399-014	HASL-300
	Uranium-235/236	0.188 ± 0.0741	0.106	0.0438	NE	NE		J	122399-014	HASL-300
	Uranium-238	2.16 ± 0.314	0.0916	0.0386	NE	NE			122399-014	HASL-300
	Radium-226	3.44 ± 0.911	0.313	0.0952	5 pCi/L	5 pCi/L			122399-012	EPA 903.1M
	Radium-228	0.644 ± 0.378	0.450	0.184	5 pCi/L	5 pCi/L		J	122399-013	EPA 904.0/SW846-9320M

See notes at end of tables.

Table 2A-7 (continued)
Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, Isotopic Uranium, and Radium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Activity[a] (pCi/L)	MDA[b] (pCi/L)	Critical Level[c] (pCi/L)	MCL / MAC[d]		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
MRN-2	Americium-241	15.6 ± 19.1	27.5	13.4	NE	NE	U	BD	122357-010	EPA 901.1
22-Apr-24	Cesium-137	-1.39 ± 3.37	3.81	1.81	NE	NE	U	BD	122357-010	EPA 901.1
	Cobalt-60	1.50 ± 2.28	4.19	1.95	NE	NE	U	BD	122357-010	EPA 901.1
	Potassium-40	52.9 ± 34.3	37.2	17.2	NE	NE		J	122357-010	EPA 901.1
	Gross Alpha	1.52	NA	NA	15 pCi/L	NE	NA	None	122357-011	EPA 900.0/SW846-9310
	Gross Beta	4.70 ± 0.683	0.878	0.423	4 mrem/yr	NE	*		122357-011	EPA 900.0/SW846-9310
	Radium-226	0.958 ± 0.518	0.503	0.176	5 pCi/L	5 pCi/L		J	122357-012	EPA 903.1M
	Radium-228	0.761 ± 0.420	0.499	0.211	5 pCi/L	5 pCi/L		J	122357-013	EPA 904.0/SW846-9320M
MRN-3D	Americium-241	-13.4 ± 29.7	26.8	12.9	NE	NE	U	BD	122359-010	EPA 901.1
23-Apr-24	Cesium-137	0.263 ± 1.88	3.36	1.58	NE	NE	U	BD	122359-010	EPA 901.1
	Cobalt-60	1.07 ± 5.41	4.76	2.21	NE	NE	U	BD	122359-010	EPA 901.1
	Potassium-40	72.5 ± 64.5	30.7	13.7	NE	NE		J	122359-010	EPA 901.1
	Gross Alpha	1.12	NA	NA	15 pCi/L	NE	NA	None	122359-011	EPA 900.0/SW846-9310
	Gross Beta	4.55 ± 0.825	1.14	0.549	4 mrem/yr	NE	*		122359-011	EPA 900.0/SW846-9310
	Radium-226	1.54 ± 0.738	0.653	0.238	5 pCi/L	5 pCi/L		J	122359-012	EPA 903.1M
	Radium-228	0.440 ± 0.292	0.397	0.171	5 pCi/L	5 pCi/L		J	122359-013	EPA 904.0/SW846-9320M
NWTA3-MW3D	Americium-241	6.82 ± 13.5	21.7	10.5	NE	NE	U	BD	122352-010	EPA 901.1
18-Apr-24	Cesium-137	-3.04 ± 4.43	5.40	2.59	NE	NE	U	BD	122352-010	EPA 901.1
	Cobalt-60	1.58 ± 2.19	4.18	1.92	NE	NE	U	BD	122352-010	EPA 901.1
	Potassium-40	-28.7 ± 46.5	55.4	26.0	NE	NE	U	BD	122352-010	EPA 901.1
	Gross Alpha	1.28	NA	NA	15 pCi/L	NE	NA	None	122352-011	EPA 900.0/SW846-9310
	Gross Beta	12.2 ± 0.746	0.640	0.308	4 mrem/yr	NE			122352-011	EPA 900.0/SW846-9310
	Radium-226	0.719 ± 0.500	0.569	0.186	5 pCi/L	5 pCi/L		J	122352-012	EPA 903.1M
	Radium-228	0.159 ± 0.255	0.441	0.187	5 pCi/L	5 pCi/L	U	BD	122352-013	EPA 904.0/SW846-9320M
NWTA3-MW3D	Americium-241	-4.30 ± 12.8	20.3	9.82	NE	NE	U	BD	122353-010	EPA 901.1
(Duplicate)	Cesium-137	-2.86 ± 4.84	5.26	2.53	NE	NE	U	BD	122353-010	EPA 901.1
18-Apr-24	Cobalt-60	0.900 ± 2.18	4.01	1.85	NE	NE	U	BD	122353-010	EPA 901.1
	Potassium-40	-87.7 ± 61.0	62.2	29.5	NE	NE	U	BD	122353-010	EPA 901.1
	Gross Alpha	0.75	NA	NA	15 pCi/L	NE	NA	None	122353-011	EPA 900.0/SW846-9310
	Gross Beta	4.20 ± 0.507	0.583	0.279	4 mrem/yr	NE			122353-011	EPA 900.0/SW846-9310
	Radium-226	0.112 ± 0.281	0.558	0.195	5 pCi/L	5 pCi/L	U	BD	122353-012	EPA 903.1M
	Radium-228	0.194 ± 0.268	0.451	0.194	5 pCi/L	5 pCi/L	U	BD	122353-013	EPA 904.0/SW846-9320M

See notes at end of tables.

Table 2A-7 (continued)
Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, Isotopic Uranium, and Radium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Activity[a] (pCi/L)	MDA[b] (pCi/L)	Critical Level[c] (pCi/L)	MCL / MAC[d] (pCi/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
OBS-MW1	Americium-241	-6.93 ± 10.2	15.6	7.52	NE	NE	U	BD	122330-010	EPA 901.1
11-Apr-24	Cesium-137	2.13 ± 2.11	3.44	1.62	NE	NE	U	BD	122330-010	EPA 901.1
	Cobalt-60	1.84 ± 2.41	4.37	2.02	NE	NE	U	BD	122330-010	EPA 901.1
	Potassium-40	-43.6 ± 43.0	47.9	22.3	NE	NE	U	BD	122330-010	EPA 901.1
	Gross Alpha	0.12	NA	NA	15 pCi/L	NE	NA	None	122330-011	EPA 900.0/SW846-9310
	Gross Beta	5.48 ± 0.893	1.18	0.572	4 mrem/yr	NE			122330-011	EPA 900.0/SW846-9310
	Uranium-233/234	16.0 ± 1.54	0.0707	0.0316	NE	NE			122330-014	HASL-300
	Uranium-235/236	0.219 ± 0.0608	0.0627	0.0267	NE	NE			122330-014	HASL-300
	Uranium-238	2.86 ± 0.319	0.0545	0.0235	NE	NE			122330-014	HASL-300
	Radium-226	0.823 ± 0.490	0.483	0.150	5 pCi/L	5 pCi/L		J	122330-012	EPA 903.1M
	Radium-228	0.214 ± 0.309	0.522	0.235	5 pCi/L	5 pCi/L	U	BD	122330-013	EPA 904.0/SW846-9320M
PL-2	Americium-241	-6.41 ± 9.23	13.5	6.36	NE	NE	U	BD	122367-010	EPA 901.1
24-Apr-24	Cesium-137	-0.0282 ± 2.73	4.88	2.22	NE	NE	U	BD	122367-010	EPA 901.1
	Cobalt-60	1.45 ± 2.65	5.42	2.36	NE	NE	U	BD	122367-010	EPA 901.1
	Potassium-40	13.0 ± 50.5	47.2	20.1	NE	NE	U	BD	122367-010	EPA 901.1
	Gross Alpha	-0.29	NA	NA	15 pCi/L	NE	NA	None	122367-011	EPA 900.0/SW846-9310
	Gross Beta	5.48 ± 0.787	1.00	0.482	4 mrem/yr	NE	*		122367-011	EPA 900.0/SW846-9310
	Radium-226	2.82 ± 0.927	0.577	0.210	5 pCi/L	5 pCi/L			122367-012	EPA 903.1M
	Radium-228	0.607 ± 0.338	0.420	0.182	5 pCi/L	5 pCi/L		J	122367-013	EPA 904.0/SW846-9320M
PL-4	Americium-241	0.439 ± 10.7	19.2	9.04	NE	NE	U	BD	122371-010	EPA 901.1
25-Apr-24	Cesium-137	-1.28 ± 2.53	4.21	1.88	NE	NE	U	BD	122371-010	EPA 901.1
	Cobalt-60	1.40 ± 2.60	5.39	2.34	NE	NE	U	BD	122371-010	EPA 901.1
	Potassium-40	-17.3 ± 40.8	76.1	34.6	NE	NE	U	BD	122371-010	EPA 901.1
	Gross Alpha	1.09	NA	NA	15 pCi/L	NE	NA	None	122371-011	EPA 900.0/SW846-9310
	Gross Beta	5.38 ± 0.717	0.885	0.427	4 mrem/yr	NE	*		122371-011	EPA 900.0/SW846-9310
	Radium-226	0.505 ± 0.395	0.499	0.169	5 pCi/L	5 pCi/L		J	122371-012	EPA 903.1M
	Radium-228	1.12 ± 0.477	0.446	0.190	5 pCi/L	5 pCi/L		J	122371-013	EPA 904.0/SW846-9320M

See notes at end of tables.

Table 2A-7 (continued)
Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, Isotopic Uranium, and Radium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Activity[a] (pCi/L)	MDA[b] (pCi/L)	Critical Level[c] (pCi/L)	MCL / MAC[d] (pCi/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
SFR-2S	Americium-241	0.573 ± 10.4	17.6	8.50	NE	NE	U	BD	122377-011	EPA 901.1
30-Apr-24	Cesium-137	2.62 ± 2.54	3.84	1.82	NE	NE	U	BD	122377-011	EPA 901.1
	Cobalt-60	-1.21 ± 2.36	3.88	1.77	NE	NE	U	BD	122377-011	EPA 901.1
	Potassium-40	-33.3 ± 43.9	56.1	26.4	NE	NE	U	BD	122377-011	EPA 901.1
	Gross Alpha	-8.15	NA	NA	15 pCi/L	NE	NA	None	122377-012	EPA 900.0/SW846-9310
	Gross Beta	9.52 ± 1.78	2.38	1.15	4 mrem/yr	NE	*	NJ+	122377-012	EPA 900.0/SW846-9310
	Uranium-233/234	19.1 ± 2.42	0.169	0.0740	5 pCi/L	5 pCi/L			122377-015	HASL-300
	Uranium-235/236	0.450 ± 0.140	0.150	0.0625	5 pCi/L	5 pCi/L		J	122377-015	HASL-300
	Uranium-238	5.20 ± 0.739	0.131	0.0550	NE	NE			122377-015	HASL-300
	Radium-226	1.79 ± 0.783	0.639	0.228	NE	NE		NJ+	122377-013	EPA 903.1M
	Radium-228	0.211 ± 0.302	0.512	0.222	NE	NE	U	BD	122377-014	EPA 904.0/SW846-9320M
SFR-2S	Americium-241	0.337 ± 8.59	13.9	6.74	NE	NE	U	BD	122378-011	EPA 901.1
(Duplicate)	Cesium-137	-0.304 ± 2.03	3.10	1.46	NE	NE	U	BD	122378-011	EPA 901.1
30-Apr-24	Cobalt-60	-0.569 ± 1.93	3.39	1.55	NE	NE	U	BD	122378-011	EPA 901.1
	Potassium-40	10.9 ± 38.7	50.6	23.8	NE	NE	U	BD	122378-011	EPA 901.1
	Gross Alpha	-3.36	NA	NA	15 pCi/L	NE	NA	None	122378-012	EPA 900.0/SW846-9310
	Gross Beta	10.8 ± 1.85	2.59	1.26	4 mrem/yr	NE	*	NJ+	122378-012	EPA 900.0/SW846-9310
	Uranium-233/234	18.1 ± 2.16	0.141	0.0619	5 pCi/L	5 pCi/L			122378-015	HASL-300
	Uranium-235/236	0.420 ± 0.124	0.126	0.0523	5 pCi/L	5 pCi/L			122378-015	HASL-300
	Uranium-238	4.84 ± 0.647	0.109	0.0460	NE	NE			122378-015	HASL-300
	Radium-226	1.35 ± 0.577	0.309	0.0751	NE	NE		NJ+	122378-013	EPA 903.1M
	Radium-228	0.948 ± 0.457	0.514	0.225	NE	NE		J	122378-014	EPA 904.0/SW846-9320M
SFR-4T	Americium-241	11.6 ± 9.49	10.3	5.01	NE	NE	X	R	122384-011	EPA 901.1
29-Apr-24	Cesium-137	-3.20 ± 3.80	2.90	1.37	NE	NE	U	BD	122384-011	EPA 901.1
	Cobalt-60	1.72 ± 1.96	3.49	1.62	NE	NE	U	BD	122384-011	EPA 901.1
	Potassium-40	6.10 ± 34.8	24.8	11.2	NE	NE	U	BD	122384-011	EPA 901.1
	Gross Alpha	0.96	NA	NA	15 pCi/L	NE	NA	None	122384-012	EPA 900.0/SW846-9310
	Gross Beta	0.836 ± 5.23	9.01	4.36	4 mrem/yr	NE	*, U	BD	122384-012	EPA 900.0/SW846-9310
	Uranium-233/234	0.373 ± 0.0961	0.107	0.0471	5 pCi/L	5 pCi/L			122384-015	HASL-300
	Uranium-235/236	0.0149 ± 0.0249	0.0958	0.0398	5 pCi/L	5 pCi/L	U	BD	122384-015	HASL-300
	Uranium-238	0.0604 ± 0.0385	0.0831	0.0350	NE	NE	U	BD	122384-015	HASL-300
	Radium-226	0.502 ± 0.395	0.468	0.146	NE	NE		J	122384-013	EPA 903.1M
	Radium-228	-0.0694 ± 0.255	0.492	0.221	NE	NE	U	BD	122384-014	EPA 904.0/SW846-9320M

See notes at end of tables.

Table 2A-7 (continued)
Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, Isotopic Uranium, and Radium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Activity[a] (pCi/L)	MDA[b] (pCi/L)	Critical Level[c] (pCi/L)	MCL / MAC[d] (pCi/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
SWTA3-MW2	Americium-241	-6.54 ± 28.9	26.9	12.9	NE	NE	U	BD	122340-011	EPA 901.1
16-Apr-24	Cesium-137	2.07 ± 2.24	3.56	1.68	NE	NE	U	BD	122340-011	EPA 901.1
	Cobalt-60	-3.41 ± 4.01	4.60	2.13	NE	NE	U	BD	122340-011	EPA 901.1
	Potassium-40	35.0 ± 59.0	28.1	12.3	NE	NE		J	122340-011	EPA 901.1
	Gross Alpha	2.07	NA	NA	15 pCi/L	NE	NA	None	122340-012	EPA 900.0/SW846-9310
	Gross Beta	5.93 ± 0.690	0.777	0.374	4 mrem/yr	NE			122340-012	EPA 900.0/SW846-9310
	Radium-226	0.520 ± 0.400	0.513	0.174	5 pCi/L	5 pCi/L		NJ+	122340-013	EPA 903.1M
	Radium-228	0.880 ± 0.409	0.453	0.200	5 pCi/L	5 pCi/L		NJ+	122340-014	EPA 904.0/SW846-9320M
SWTA3-MW2	Americium-241	1.84 ± 13.1	22.5	10.8	NE	NE	U	BD	122341-011	EPA 901.1
(Duplicate)	Cesium-137	-0.896 ± 4.52	3.73	1.76	NE	NE	U	BD	122341-011	EPA 901.1
16-Apr-24	Cobalt-60	-1.02 ± 2.48	4.33	1.99	NE	NE	U	BD	122341-011	EPA 901.1
	Potassium-40	56.2 ± 38.6	42.9	19.7	NE	NE		J	122341-011	EPA 901.1
	Gross Alpha	2.04	NA	NA	15 pCi/L	NE	NA	None	122341-012	EPA 900.0/SW846-9310
	Gross Beta	5.35 ± 0.687	0.808	0.389	4 mrem/yr	NE			122341-012	EPA 900.0/SW846-9310
	Radium-226	0.0623 ± 0.287	0.622	0.217	5 pCi/L	5 pCi/L	U	BD	122341-013	EPA 903.1M
	Radium-228	0.501 ± 0.331	0.451	0.195	5 pCi/L	5 pCi/L		NJ+	122341-014	EPA 904.0/SW846-9320M
SWTA3-MW3	Americium-241	0.569 ± 7.17	11.9	5.57	NE	NE	U	BD	122336-011	EPA 901.1
15-Apr-24	Cesium-137	1.43 ± 2.76	5.31	2.39	NE	NE	U	BD	122336-011	EPA 901.1
	Cobalt-60	-1.33 ± 2.45	4.28	1.75	NE	NE	U		122336-011	EPA 901.1
	Potassium-40	11.9 ± 58.9	51.7	22.0	NE	NE	U	BD	122336-011	EPA 901.1
	Gross Alpha	1.00	NA	NA	15 pCi/L	NE	NA	None	122336-012	EPA 900.0/SW846-9310
	Gross Beta	5.75 ± 0.825	0.986	0.473	4 mrem/yr	NE			122336-012	EPA 900.0/SW846-9310
	Radium-226	2.26 ± 0.891	0.653	0.233	5 pCi/L	5 pCi/L			122336-013	EPA 903.1M
	Radium-228	1.31 ± 0.540	0.464	0.195	5 pCi/L	5 pCi/L		J	122336-014	EPA 904.0/SW846-9320M

See notes at end of tables.

Table 2A-7 (concluded)
Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, Isotopic Uranium, and Radium Results, Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Activity[a] (pCi/L)	MDA[b] (pCi/L)	Critical Level[c] (pCi/L)	MCL / MAC[d] (pCi/L)		Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
SWTA3-MW4	Americium-241	-0.571 ± 6.80	12.0	5.62	NE	NE	U	BD	122346-011	EPA 901.1
17-Apr-24	Cesium-137	-1.60 ± 2.96	4.91	2.20	NE	NE	U	BD	122346-011	EPA 901.1
	Cobalt-60	-3.58 ± 3.04	3.64	1.43	NE	NE	U	BD	122346-011	EPA 901.1
	Potassium-40	19.9 ± 51.2	53.4	22.8	NE	NE	U	BD	122346-011	EPA 901.1
	Gross Alpha	1.95	NA	NA	15 pCi/L	NE	NA	None	122346-012	EPA 900.0/SW846-9310
	Gross Beta	25.8 ± 1.35	1.01	0.485	4 mrem/yr	NE			122346-012	EPA 900.0/SW846-9310
	Radium-226	0.553 ± 0.342	0.281	0.0686	5 pCi/L	5 pCi/L		J	122346-013	EPA 903.1M
	Radium-228	0.777 ± 0.414	0.490	0.211	5 pCi/L	5 pCi/L		J	122346-014	EPA 904.0/SW846-9320M
TRE-1	Americium-241	2.56 ± 15.5	26.4	12.8	NE	NE	U	BD	122386-011	EPA 901.1
01-May-24	Cesium-137	-0.313 ± 2.54	4.01	1.90	NE	NE	U	BD	122386-011	EPA 901.1
	Cobalt-60	1.26 ± 2.59	4.65	2.16	NE	NE	U	BD	122386-011	EPA 901.1
	Potassium-40	26.7 ± 48.1	61.6	29.2	NE	NE	U	BD	122386-011	EPA 901.1
	Gross Alpha	-4.59	NA	NA	15 pCi/L	NE	NA	None	122386-012	EPA 900.0/SW846-9310
	Gross Beta	16.1 ± 2.48	3.11	1.50	4 mrem/yr	NE	*		122386-012	EPA 900.0/SW846-9310
	Uranium-233/234	23.0 ± 2.59	0.124	0.0543	NE	NE			122386-015	HASL-300
	Uranium-235/236	0.486 ± 0.126	0.110	0.0459	NE	NE			122386-015	HASL-300
	Uranium-238	5.70 ± 0.710	0.0958	0.0404	NE	NE			122386-015	HASL-300
	Radium-226	2.64 ± 0.818	0.294	0.0717	5 pCi/L	5 pCi/L			122386-013	EPA 903.1M
	Radium-228	0.300 ± 0.322	0.517	0.225	5 pCi/L	5 pCi/L	U	BD	122386-014	EPA 904.0/SW846-9320M

See notes at end of tables.

Table 2A-8
Summary of Field Water Quality Parameter Measurements[h], Groundwater Monitoring Program, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Sample Date	Temperature (^{0}C)	Specific Conductivity (µmho/cm)	Oxidation Reduction Potential (mV)	pH	Turbidity (NTU)	Dissolved Oxygen (% Sat)	Dissolved Oxygen (mg/L)
Coyote Springs	10-Apr-24	12.70	2201.2	173.8	6.23	0.02	28.36	2.41
CCBA-MW2	02-May-24	16.75	647.53	110.2	7.62	0.36	80.30	6.24
CTF-MW1	06-May-24	16.91	692.48	132.3	7.39	0.94	91.23	7.02
CYN-MW5	07-May-24	16.90	359.11	149.0	6.15	0.48	56.74	4.55
Greystone-MW2	08-May-24	17.93	1221.6	130.1	7.06	0.64	87.42	6.89
MRN-2	22-Apr-24	18.84	384.39	73.4	7.76	0.44	99.76	7.89
MRN-3D	23-Apr-24	20.65	443.77	104.0	7.60	1.49	74.92	5.44
NWTA3-MW3D	18-Apr-24	20.40	370.64	77.3	7.78	0.02	56.97	4.16
OBS-MW1	11-Apr-24	17.21	506.92	70.2	7.53	0.02	46.04	3.60
PL-2	24-Apr-24	19.81	439.41	115.8	7.77	0.49	86.06	6.39
PL-4	25-Apr-24	19.00	467.91	114.6	7.46	1.80	77.31	5.79
SFR-2S	30-Apr-24	18.06	1024.0	120.2	6.91	1.76	99.01	7.55
SFR-2S	22-May-24	18.74	1205.0	115.9	6.94	0.71	98.39	7.42
SFR-4T	29-Apr-24	19.06	4110.0	121.8	7.91	0.76	10.30	0.77
SWTA3-MW2	16-Apr-24	19.65	430.91	101.9	7.67	0.02	58.05	4.31
SWTA3-MW3	15-Apr-24	20.64	444.36	79.2	7.70	0.02	59.74	4.32
SWTA3-MW4	17-Apr-24	20.07	430.33	100.1	7.72	0.02	58.23	4.29
TRE-1	01-May-24	20.07	1339.0	157.2	6.73	0.28	95.19	7.00

See notes at end of tables.

Notes for Groundwater Monitoring Program Analytical Results Tables

%	= percent
$CaCO_3$	= calcium carbonate
CFR	= Code of Federal Regulations
EPA	= U.S. Environmental Protection Agency
HMX	= octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
ID	= identifier
µg/L	= micrograms per liter
mg/L	= milligrams per liter
mrem/yr	= millirem per year
NMAC	= New Mexico Administrative Code
No.	= number
pCi/L	= picocuries per liter
RDX	= hexahydro-1,3,5-trinitro-1,3,5-triazine
Tetryl	= methyl-2,4,6-trinitrophenylnitramine

[a]Result or Activity

Result applies to Tables 2A-1 and 2A-3 through 2A-6. Activity applies to Table 2A-7.

Activity	= Gross alpha activity measurements were corrected by subtracting the total uranium activity (40 CFR Part 141). Activities of zero or less are considered not detected.
Bold	= Value exceeds the established MCL or MAC.
ND	= not detected (at MDL)

[b]MDL or MDA

The MDL applies to Tables 2A-1 through 2A-6. MDA applies to Table 2A-7.

MDA	= The minimal detectable activity or minimum measured activity in a sample required to ensure a 95% probability that the measured activity is accurately quantified above the critical level.
MDL	= Method detection limit. The minimum concentration or activity that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix specific.
NA	= Not applicable for gross alpha activities. The MDA could not be calculated as the gross alpha activity was corrected by subtracting out the total uranium activity.

[c]PQL or Critical Level

The PQL applies to Tables 2A-1 and 2A-3 through 2A-6. Critical Level applies to Table 2A-7.

Critical Level	= The minimum activity that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix specific.
NA	= Not applicable for gross alpha activities. The critical level could not be calculated as the gross alpha activity was corrected by subtracting the total uranium activity.
PQL	= Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.

[d]MCL or MAC

Regulatory limits: The MCL is listed first, followed by the MAC. A single value is listed when the MCL and MAC are equal (for example, nitrate plus nitrite).

MAC = Maximum allowable concentration. MACs were established for groundwater for the contaminants specified in *Environmental Protection*, Human Health Standards, 20.6.2.3103 NMAC, (NMWQCC, December 2018).

MCL = Maximum contaminant level. Established by the EPA (EPA, March 2018).

- The total for trihalomethanes (including chloroform) is 80 mg/L.

The following are the MCLs for gross alpha particles, beta particles, and radium in community water systems:

- 15 pCi/L = gross alpha particle activity, excluding total uranium (40 CFR Part 141)
- 4 mrem/yr = any combination of beta and/or gamma emitting radionuclides (as dose rate)
- 5 pCi/L = combined radium-226 and radium-228

NE = not established

Notes for Groundwater Monitoring Program Analytical Results Tables (concluded)

[e]Laboratory Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

B	= The analyte was detected in the blank above the effective MDL.
H	= Analytical holding time was exceeded.
J	= Estimated value; the analyte concentration fell above the effective MDL and below the effective PQL.
N	= Results associated with a spike analysis that was outside control limits.
NA	= not applicable
U	= Analyte is absent or below the method detection limit.
X	= Data rejected due to peak not meeting identification criteria.
*	= Recovery or relative percent difference (RPD) not within acceptance limits and/or spike amount not compatible with the sample or the duplicate RPDs are not applicable where the concentration fails below the effective PQL.

[f]Validation Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

BD	= Below detection limit as used in radiochemistry to identify results that are not statistically different from zero.
J	= The associated value is an estimated quantity.
J+	= The associated numerical value is an estimated quantity with a suspected positive bias.
J-	= The associated numerical value is an estimated quantity with a suspected negative bias.
NJ+	= Presumptive evidence of the presence of the material at an estimated quantity with a suspected positive bias.
None	= No data validation for corrected gross alpha activity.
U	= The analyte was analyzed for but was not detected. The associated numerical value is the sample PQL.
UJ	= The analyte was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	= The data are unusable, and resampling or reanalysis are necessary for verification.

[g]Analytical Method References

Rice, E.W., Baird, R.B., Eaton, A.D., and Clesceri, L.S. (2012). *Standard Methods for the Examination of Water and Wastewater*, 23rd ed., American Public Health Association, American Water Works Association, and Water Environment Federation.

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DOE	= U.S. Department of Energy
HASL	= Health and Safety Laboratory
SM	= Standard Method
SW	= Solid Waste

[h]Field Water Quality Parameter Measurements

Field measurements were collected prior to sampling.

°C	= degrees Celsius
% Sat	= percent saturation
µmho/cm	= micromhos per centimeter
mg/L	= milligrams per liter
mV	= millivolts
NTU	= nephelometric turbidity units
pH	= potential of hydrogen (negative logarithm of the hydrogen ion concentration)

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Attachment 2B
Groundwater Monitoring Program Hydrographs and Charts

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Attachment 2B Hydrographs and Charts

Figure 2B-1 Hydrograph for Monitoring Well Greystone-MW2 ..... 2B-5

Figure 2B-2 Hydrograph for Monitoring Wells MRN-2 and MRN-3D 2B-6

Figure 2B-3 Hydrograph for Monitoring Well NWTA3-MW3D, PL-2, and PL-4 ..... 2B-7

Figure 2B-4 Hydrograph for Monitoring Well SFR-2S and TRE-1 ..... 2B-8

Figure 2B-5 Hydrograph for Monitoring Well SFR-4T 2B-9

Figure 2B-6 Hydrograph for Monitoring Wells SWTA3-MW2, SWTA3-MW3, and SWTA3-MW4 ..... 2B-10

Figure 2B-7 Hydrograph for Monitoring Well OBS-MW1 ..... 2B-11

Figure 2B-8 Hydrograph for Monitoring Well CCBA-MW2 ..... 2B-12

Figure 2B-9 Hydrograph for Monitoring Well CTF-MW1 ..... 2B-13

Figure 2B-10 Hydrograph for Monitoring Well CYN-MW5 ..... 2B-14

Figure 2B-11 Precipitation Data for Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 2B-15

Figure 2B-12 Annual Precipitation Data for Sandia National Laboratories, New Mexico, January 2015 to December 2024 ..... 2B-16

Figure 2B-13 Monthly Groundwater Pumped by Kirtland Air Force Base Production Wells, Calendar Year 2024 ..... 2B-17

Figure 2B-14 Groundwater Pumped by Kirtland Air Force Base Production Wells, Calendar Year 2024 ..... 2B-18

Figure 2B-15 Annual Groundwater Pumped by Kirtland Air Force Base Production Wells, 2014 to 2024 ..... 2B-19

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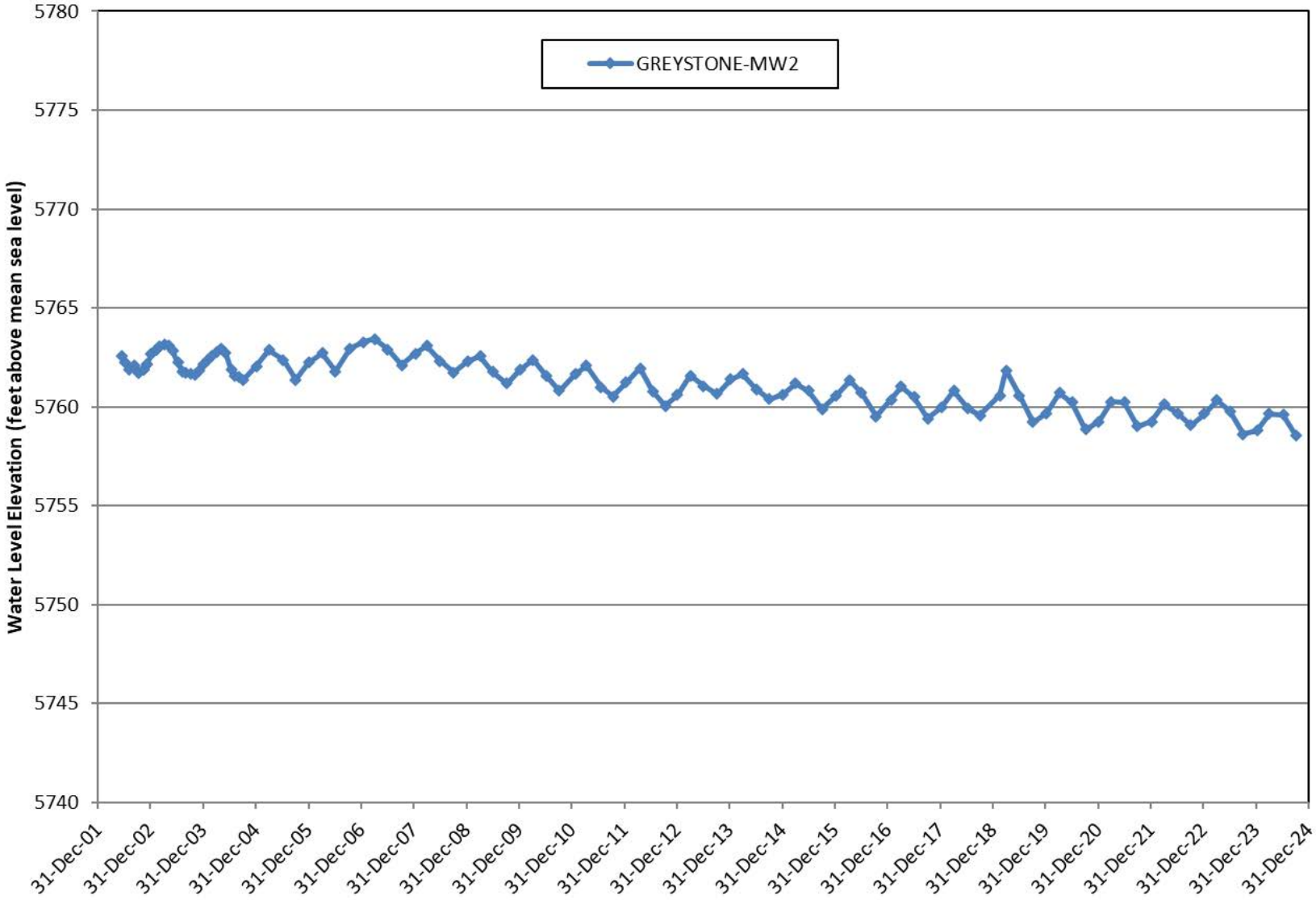


Figure 2B-1
Hydrograph for Monitoring Well Greystone-MW2

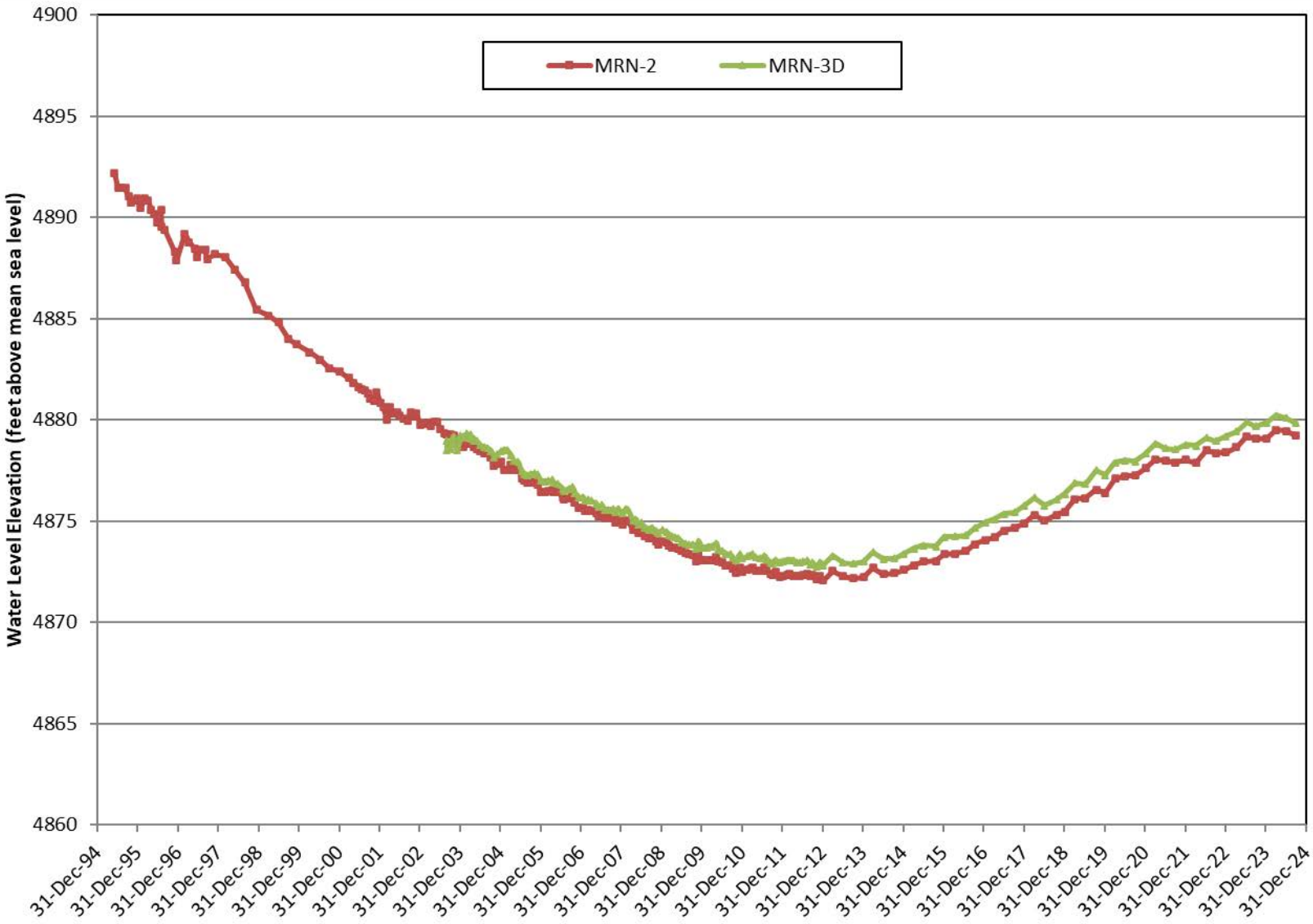


Figure 2B-2
Hydrograph for Monitoring Wells MRN-2 and MRN-3D

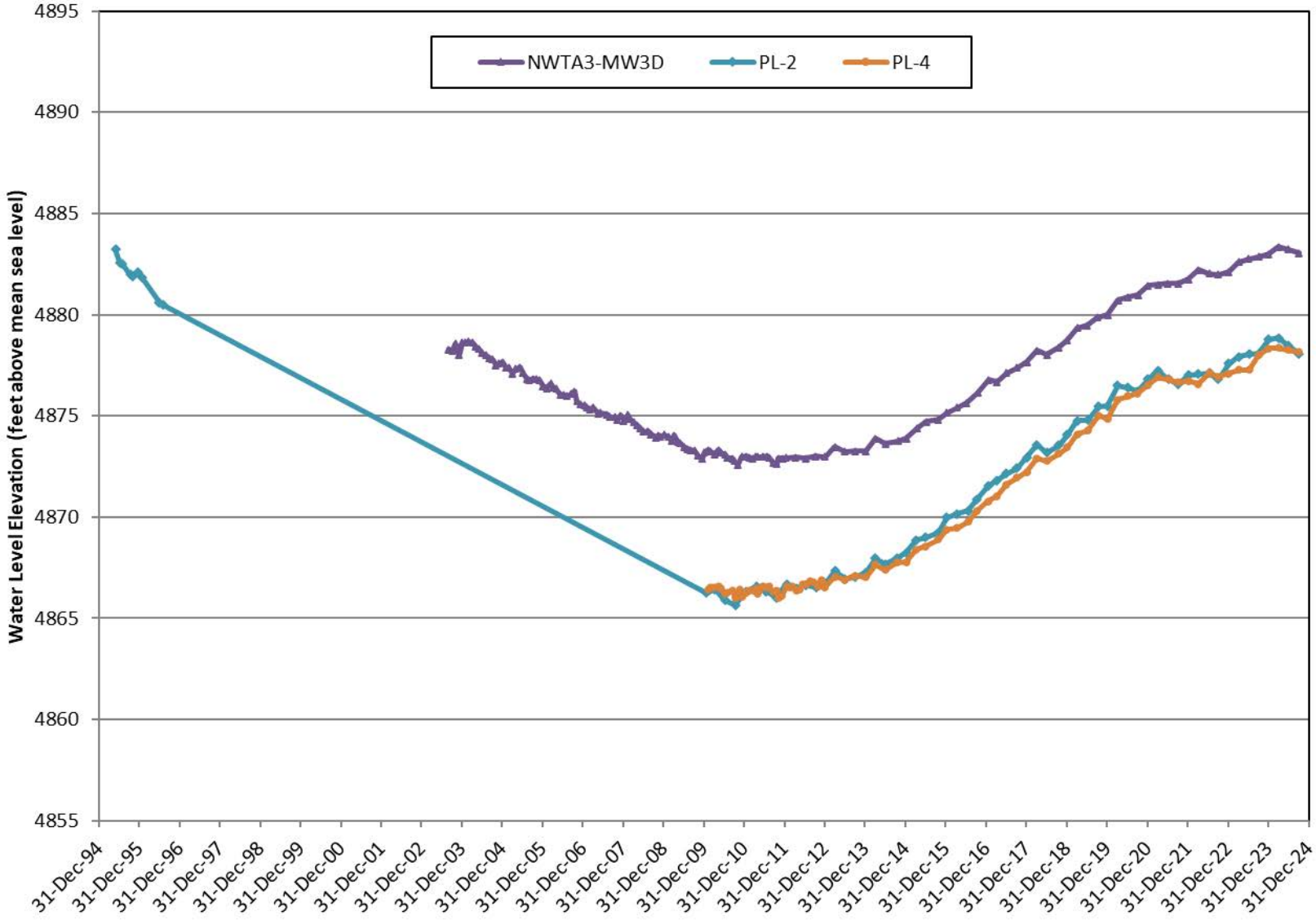


Figure 2B-3
Hydrograph for Monitoring Wells NWTA3-MW3D, PL-2, and PL-4

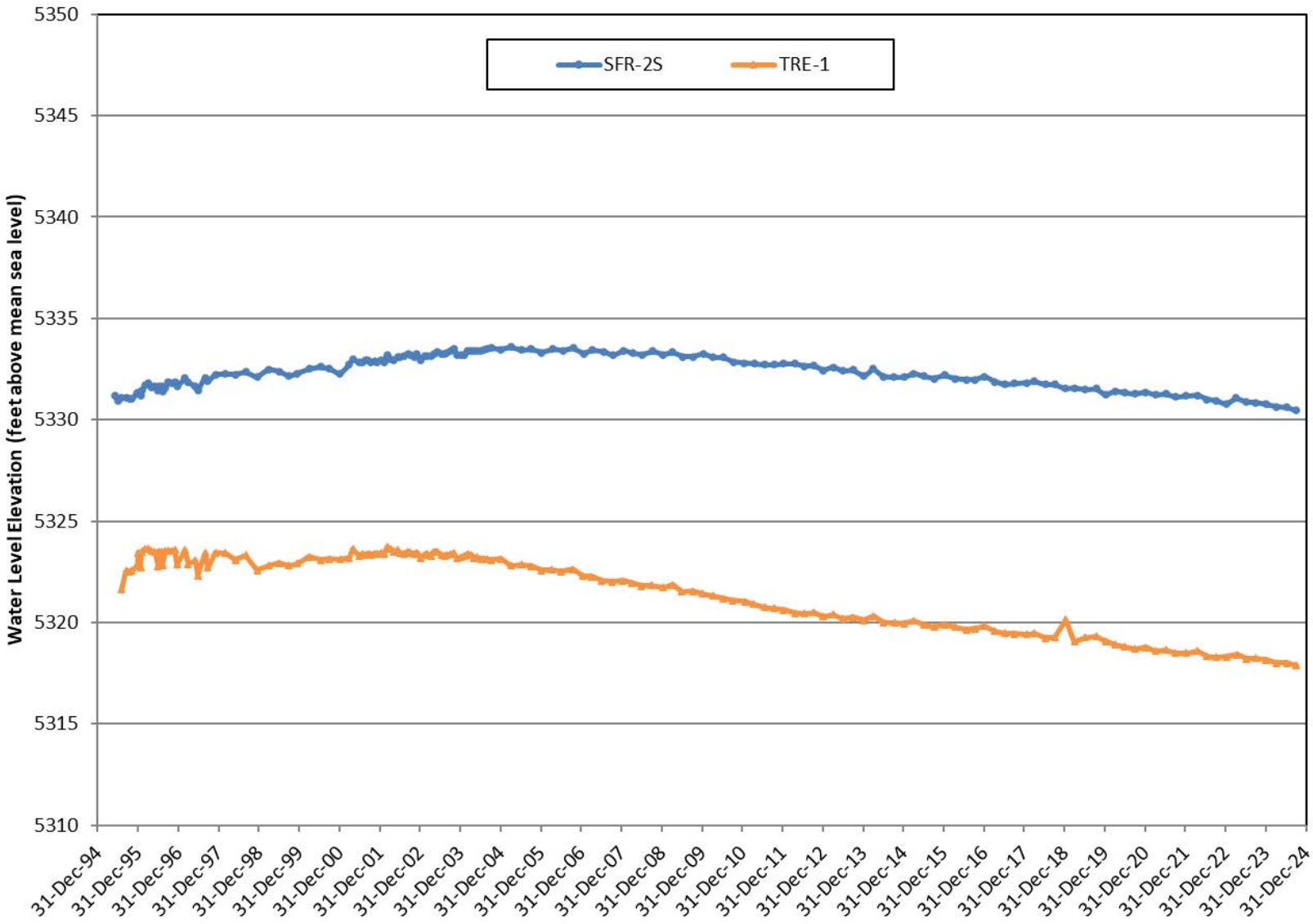


Figure 2B-4
Hydrograph for Monitoring Wells SFR-2S and TRE-1

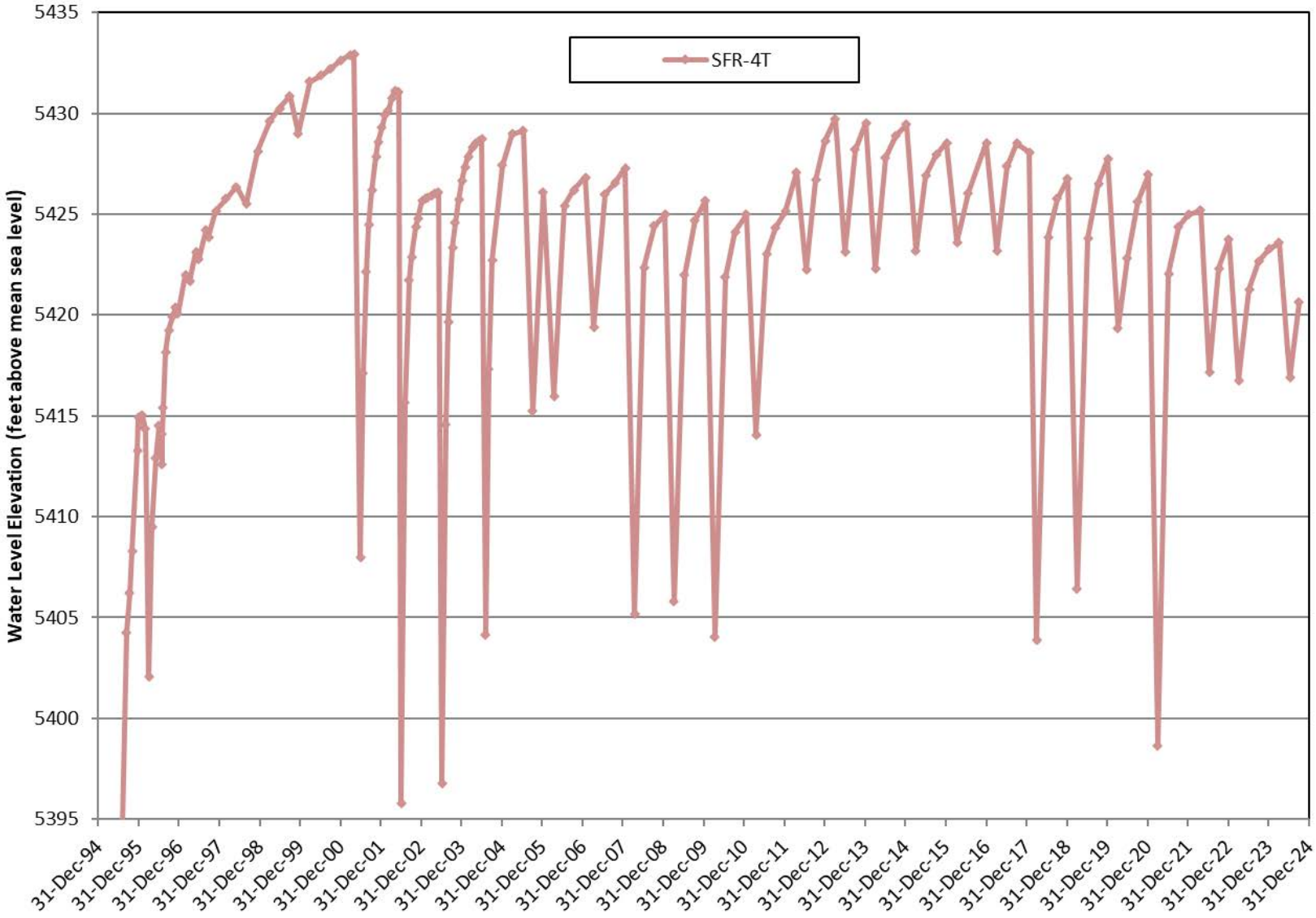


Figure 2B-5
Hydrograph for Monitoring Well SFR-4T

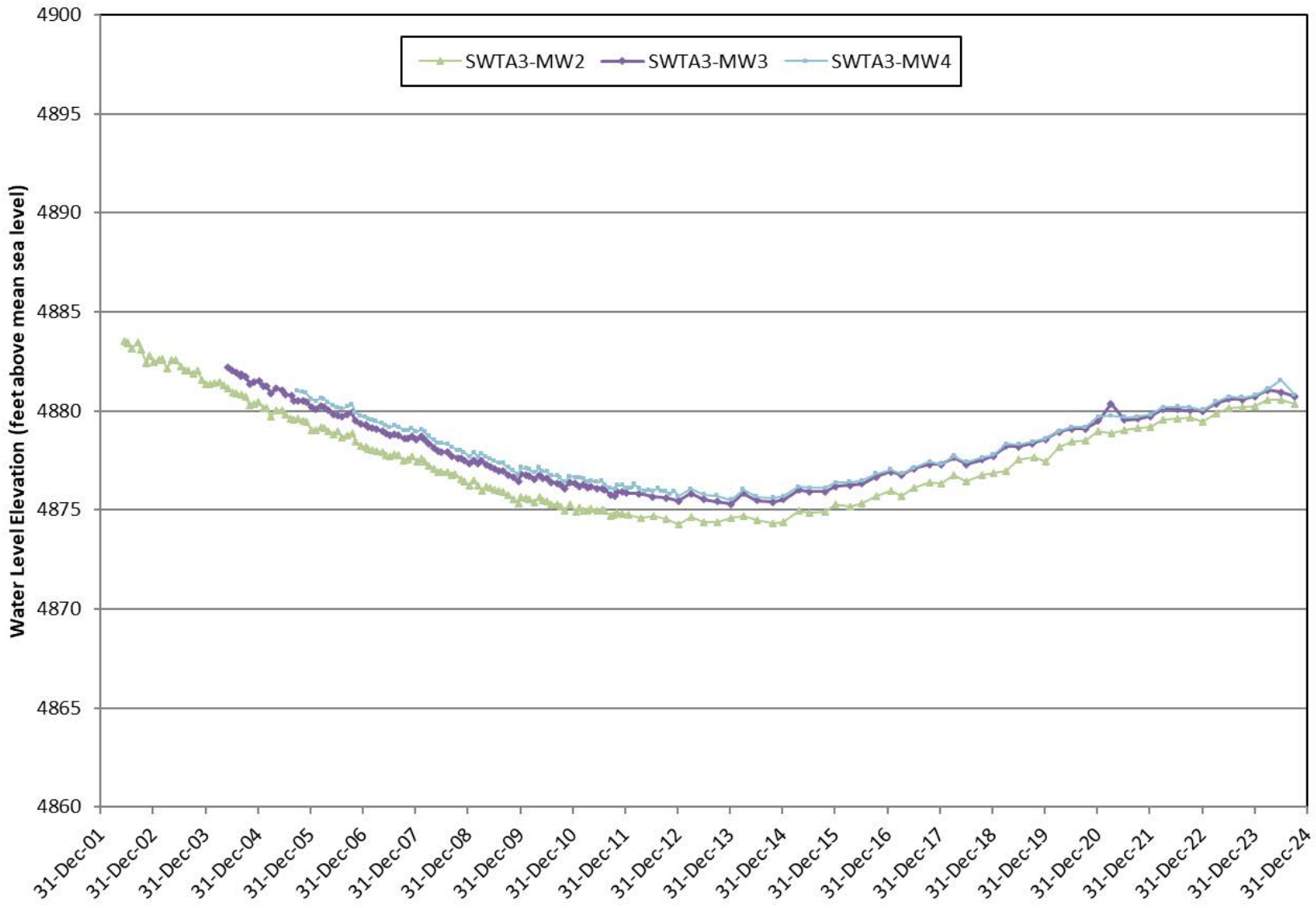


Figure 2B-6
Hydrograph for Monitoring Wells SWTA3-MW2, SWTA3-MW3, and SWTA3-MW4

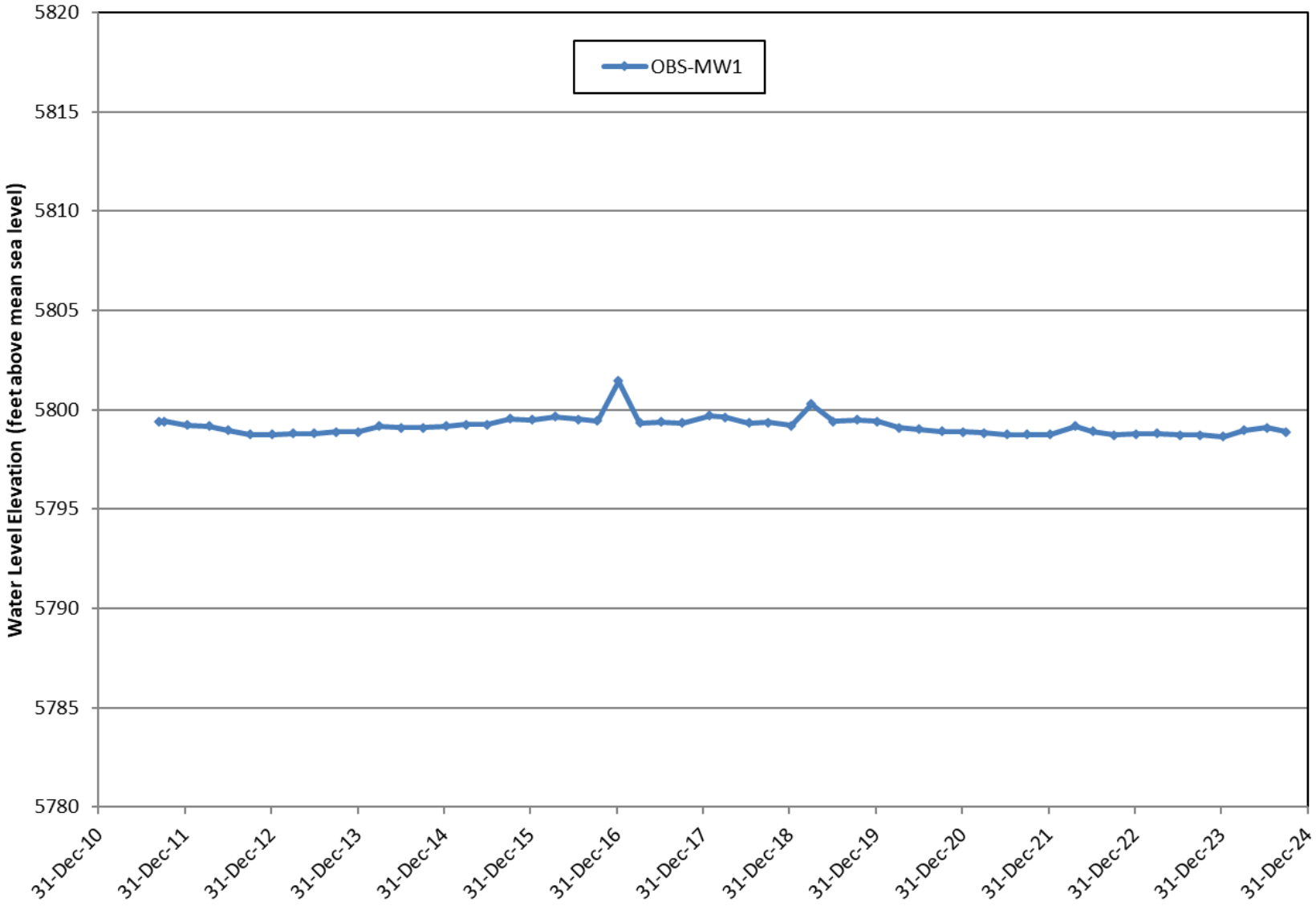


Figure 2B-7
Hydrograph for Monitoring Well OBS-MW1

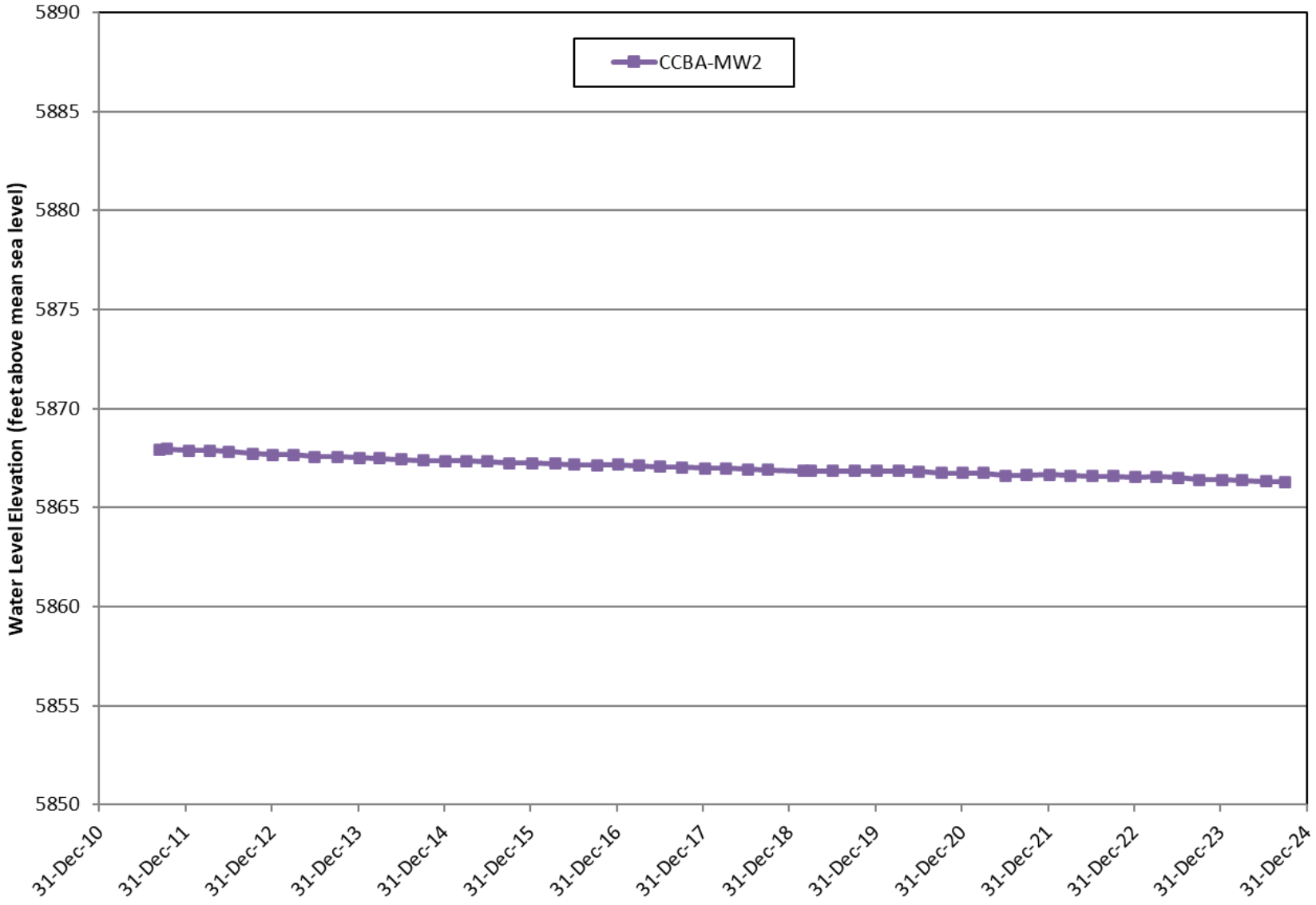


Figure 2B-8
Hydrograph for Monitoring Well CCBA-MW2

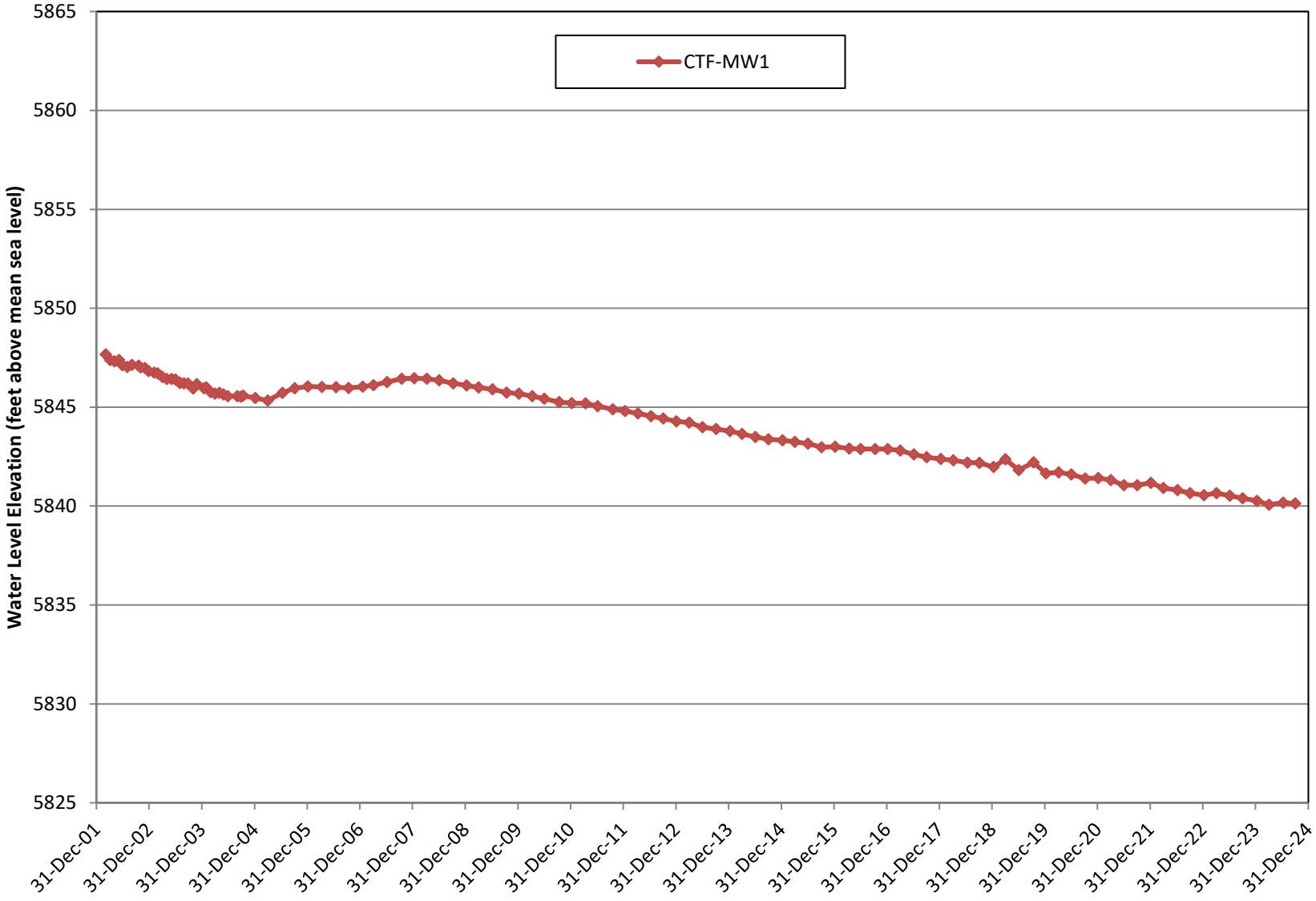


Figure 2B-9
Hydrograph for Monitoring Well CTF-MW1

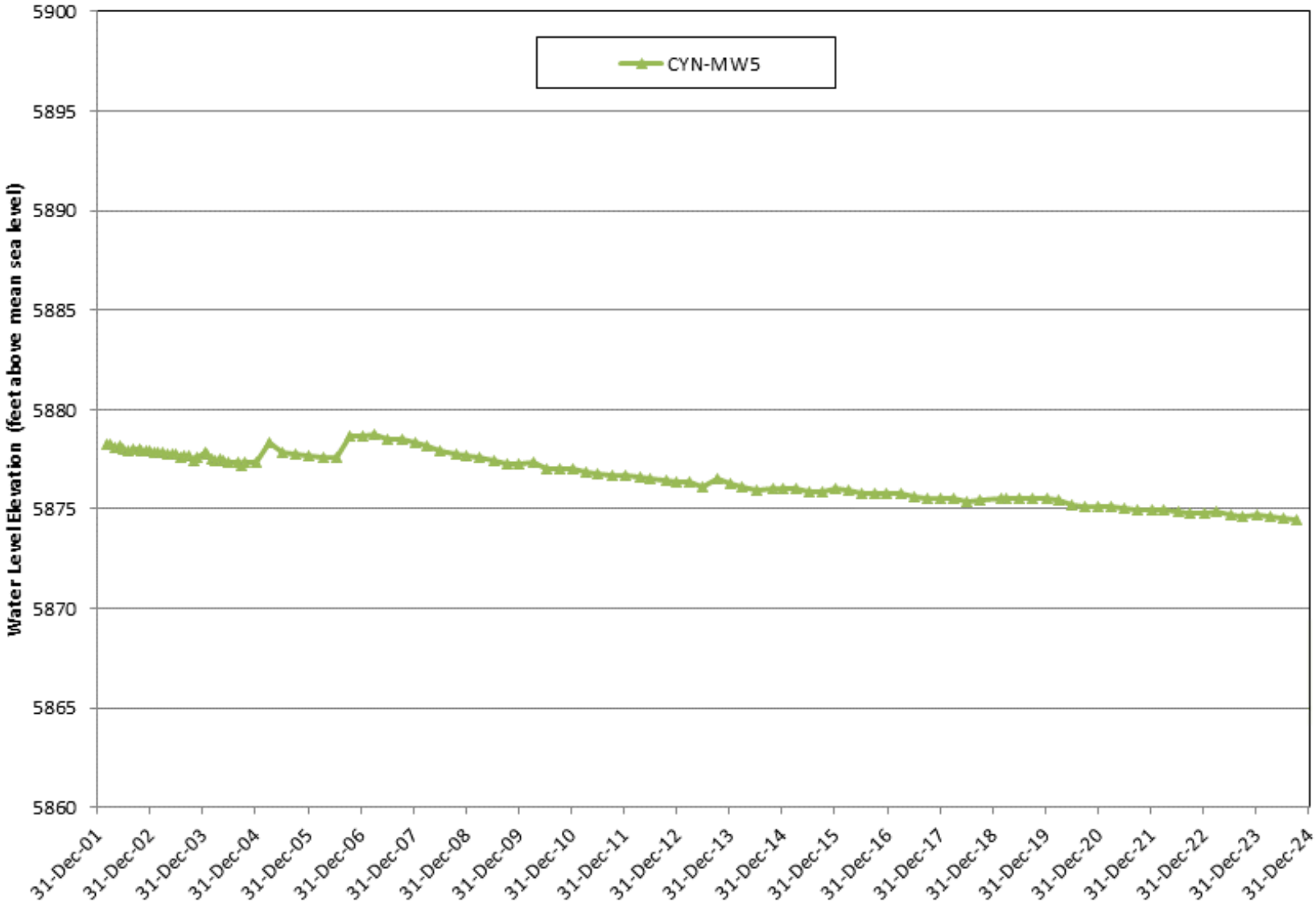


Figure 2B-10
Hydrograph for Monitoring Well CYN-MW5

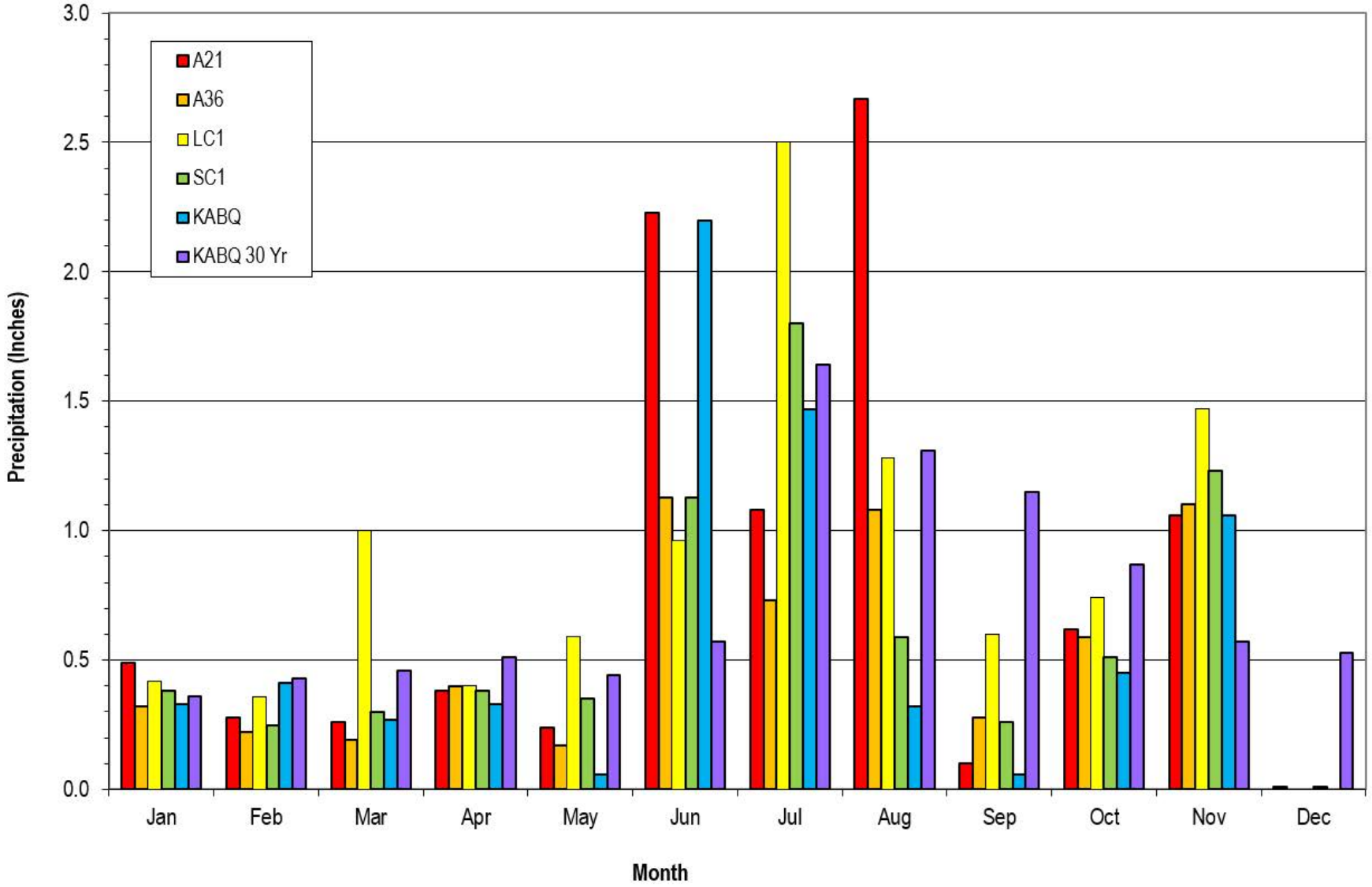


Figure 2B-11
Precipitation Data for Sandia National Laboratories, New Mexico, Calendar Year 2024

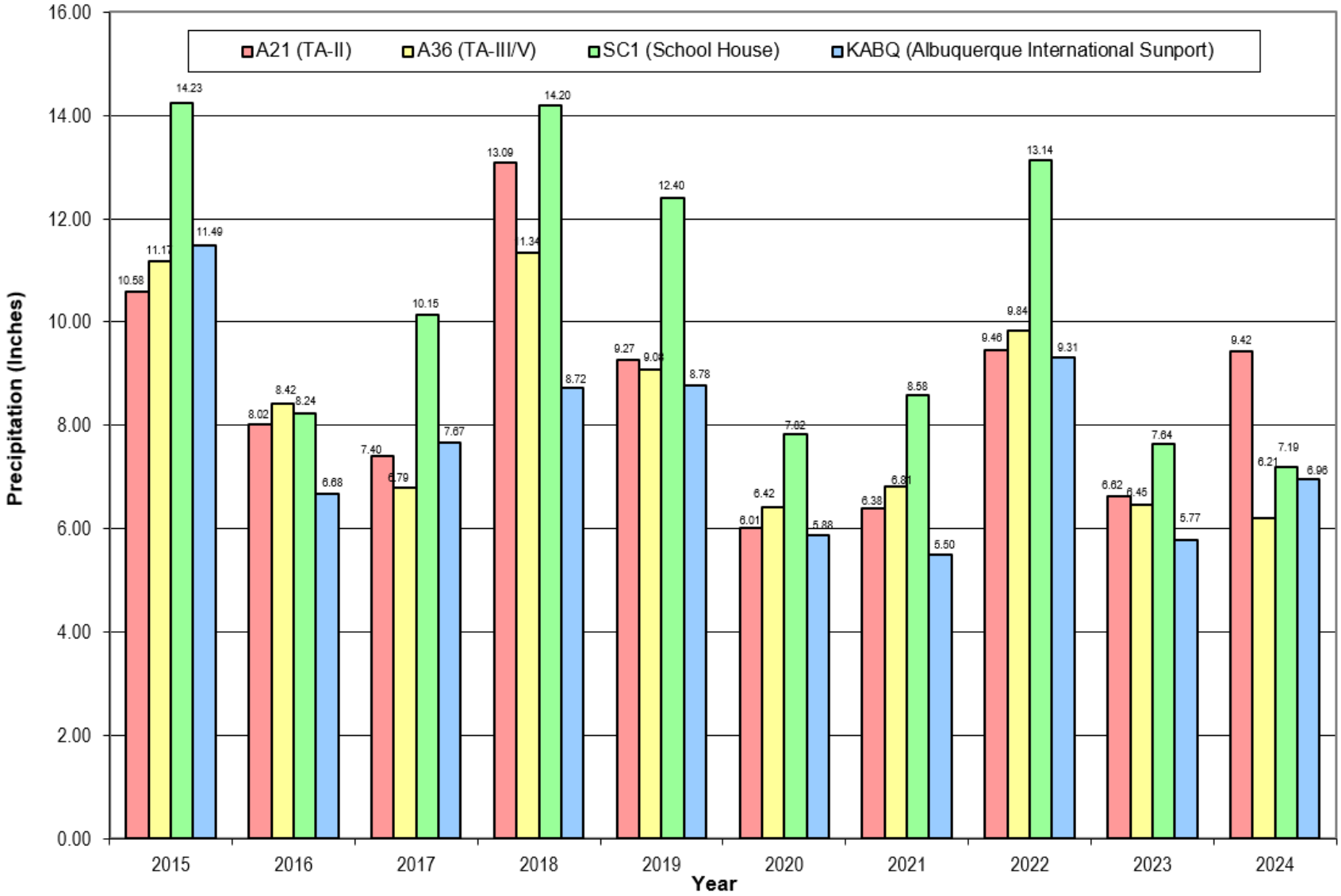


Figure 2B-12
Annual Precipitation Data for Sandia National Laboratories, New Mexico, January 2015 to December 2024

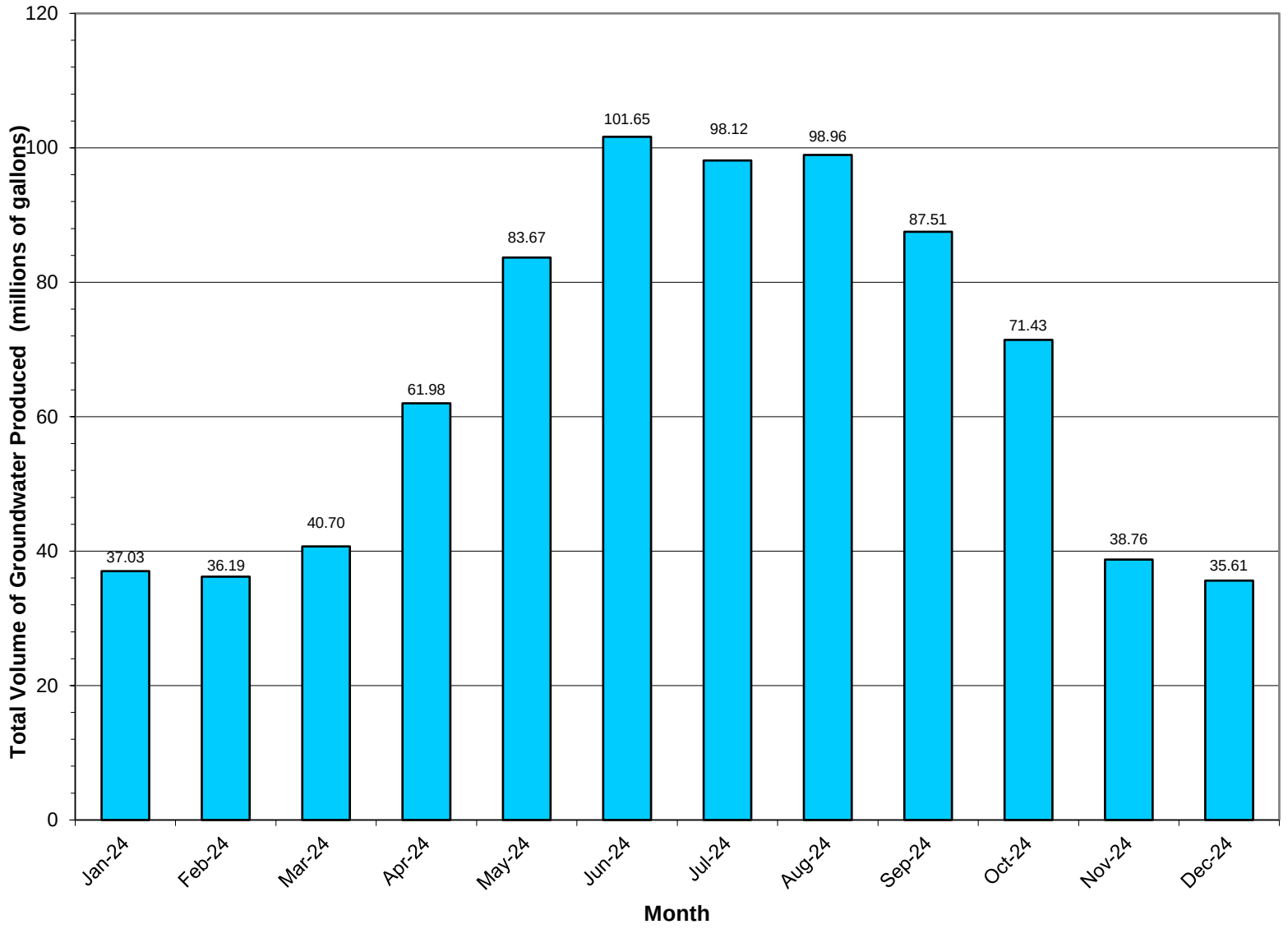


Figure 2B-13
Monthly Potable Water Pumped by Kirtland Air Force Base Production Wells, Calendar Year 2024

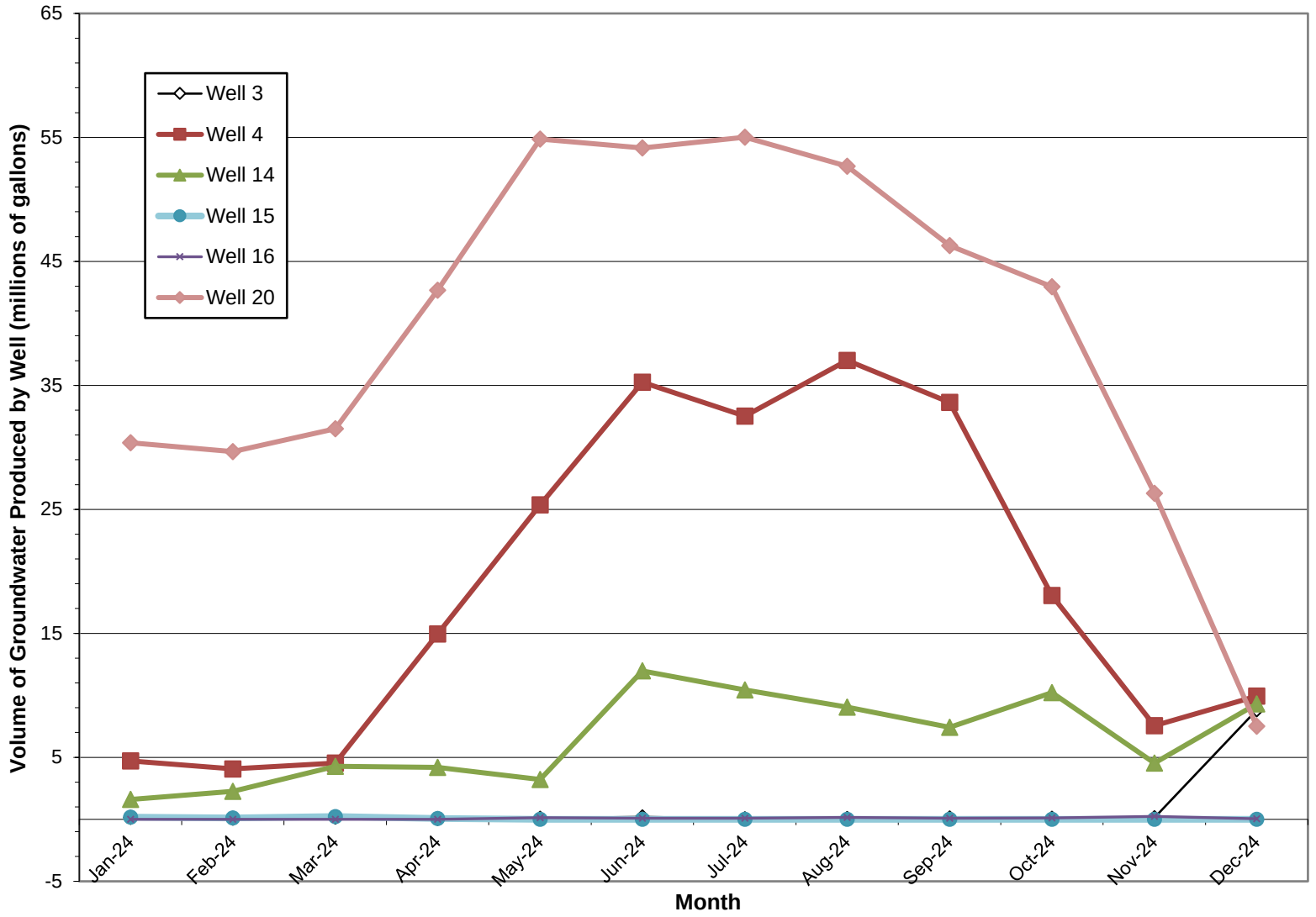


Figure 2B-14
Potable Water Pumped by Kirtland Air Force Base Production Wells, Calendar Year 2024

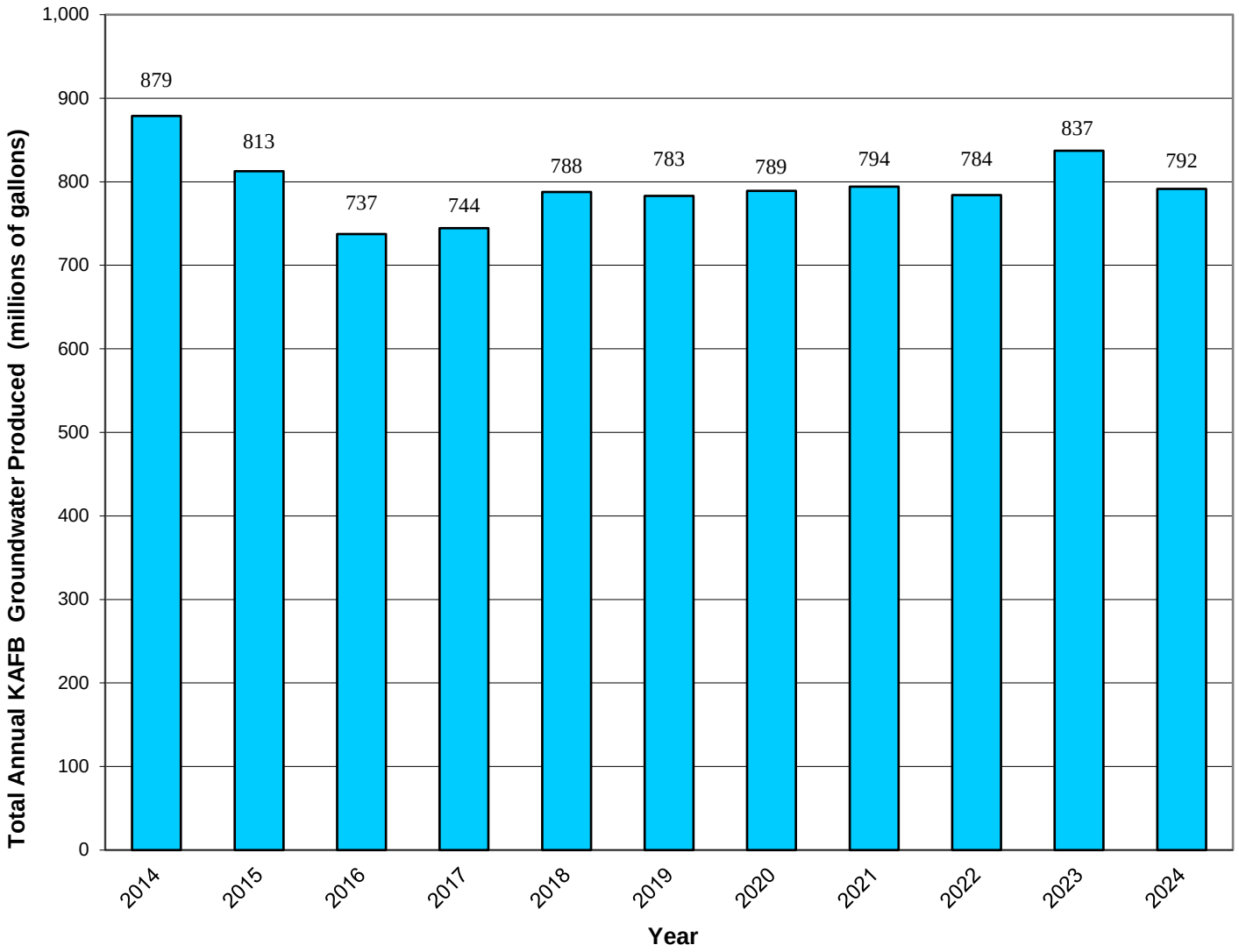


Figure 2B-15
Annual Potable Water Pumped by Kirtland Air Force Base Production Wells, 2014 to 2024

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Attachment 2C
Groundwater Monitoring Program Plots

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Attachment 2C Plots

Figure 2C-1 Fluoride Concentrations, Monitoring Well OBS-MW1 ..... 2C-5
Figure 2C-2 Fluoride Concentrations, Monitoring Well SFR-2S 2C-6
Figure 2C-3 Fluoride Concentrations, Monitoring Well SWTA3-MW4 ..... 2C-7
Figure 2C-4 Beryllium Concentrations, Coyote Springs 2C-8

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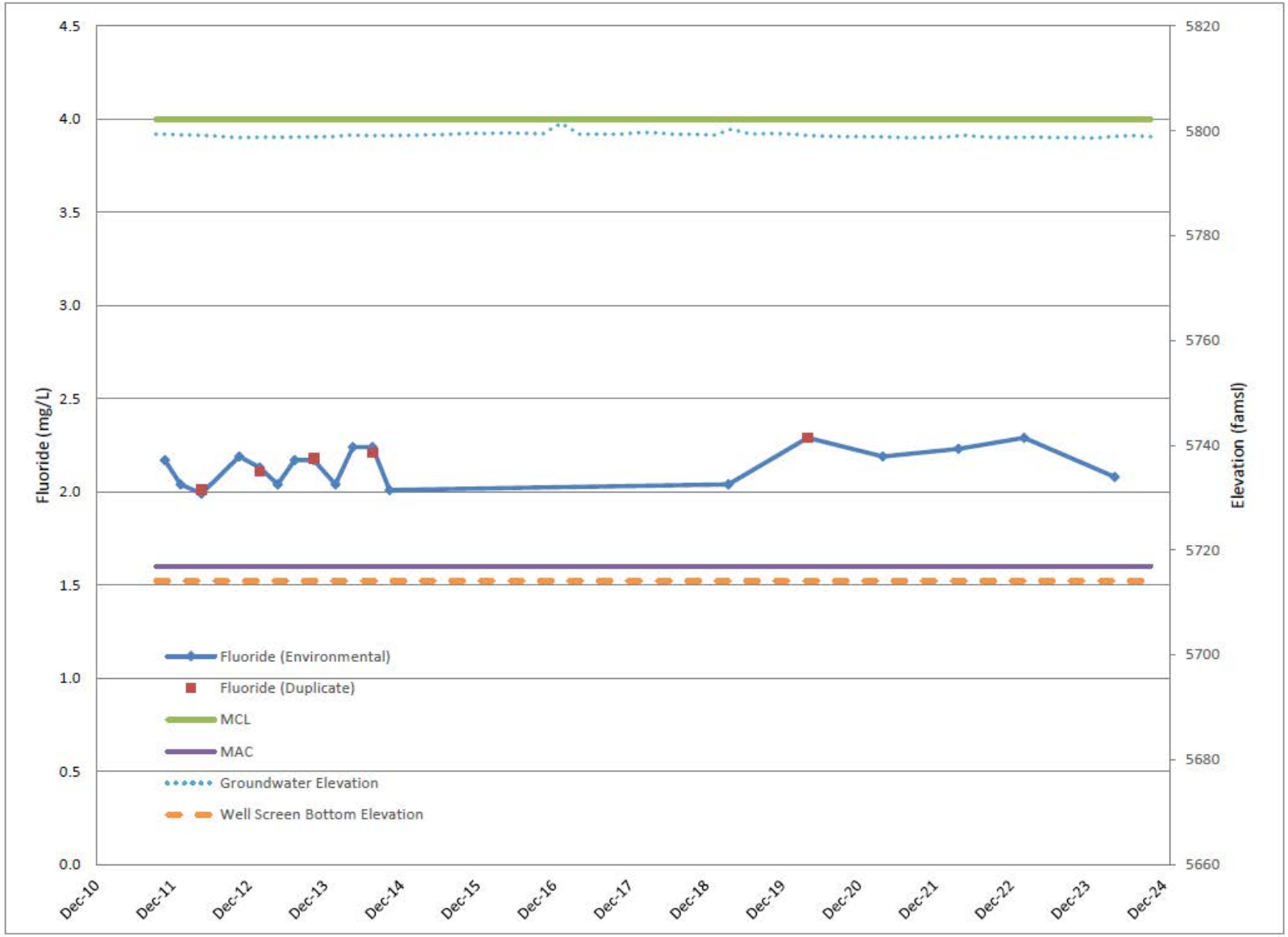


Figure 2C-1
Fluoride Concentrations, Monitoring Well OBS-MW1

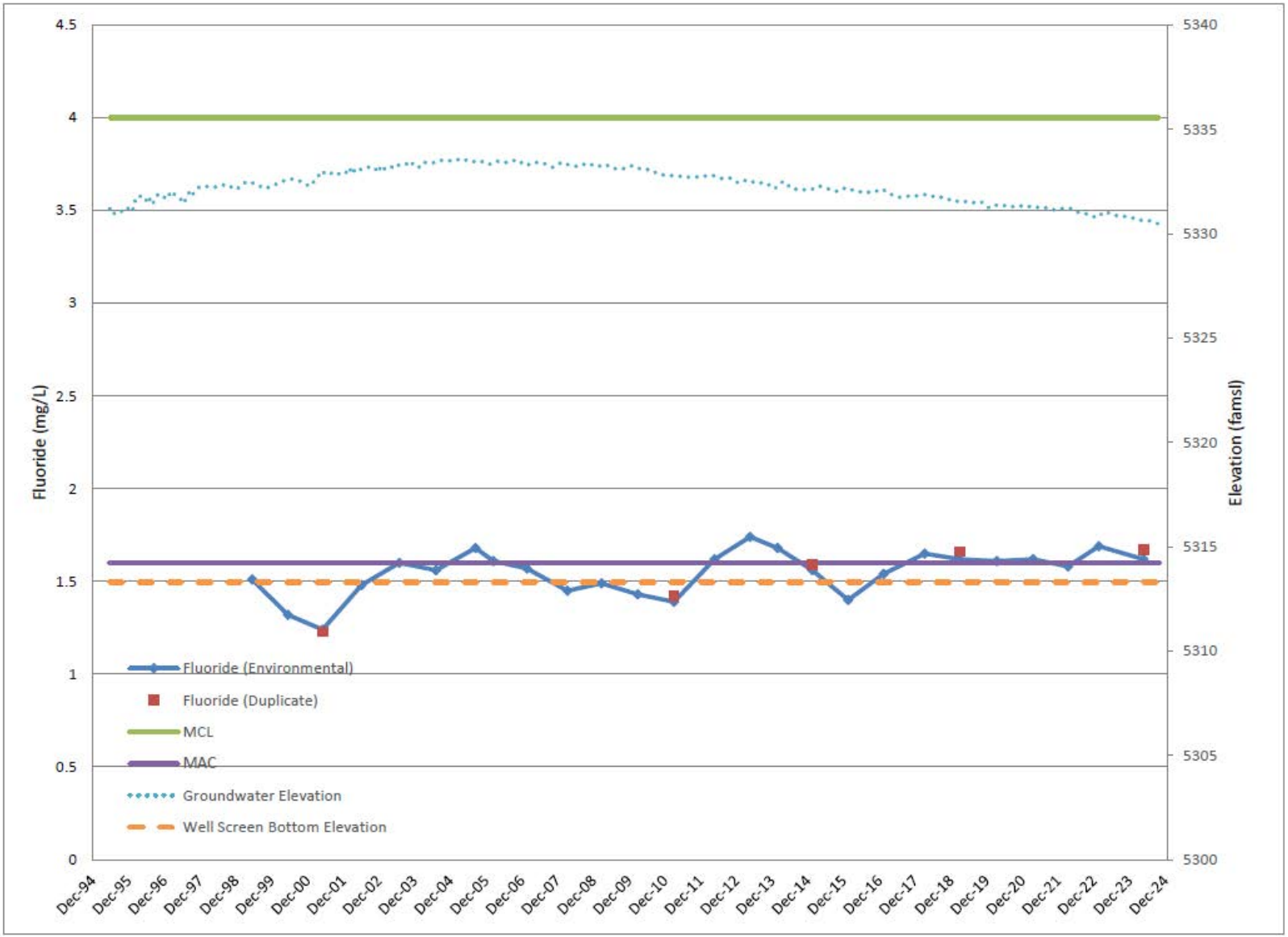


Figure 2C-2
Fluoride Concentrations, Monitoring Well SFR-2S

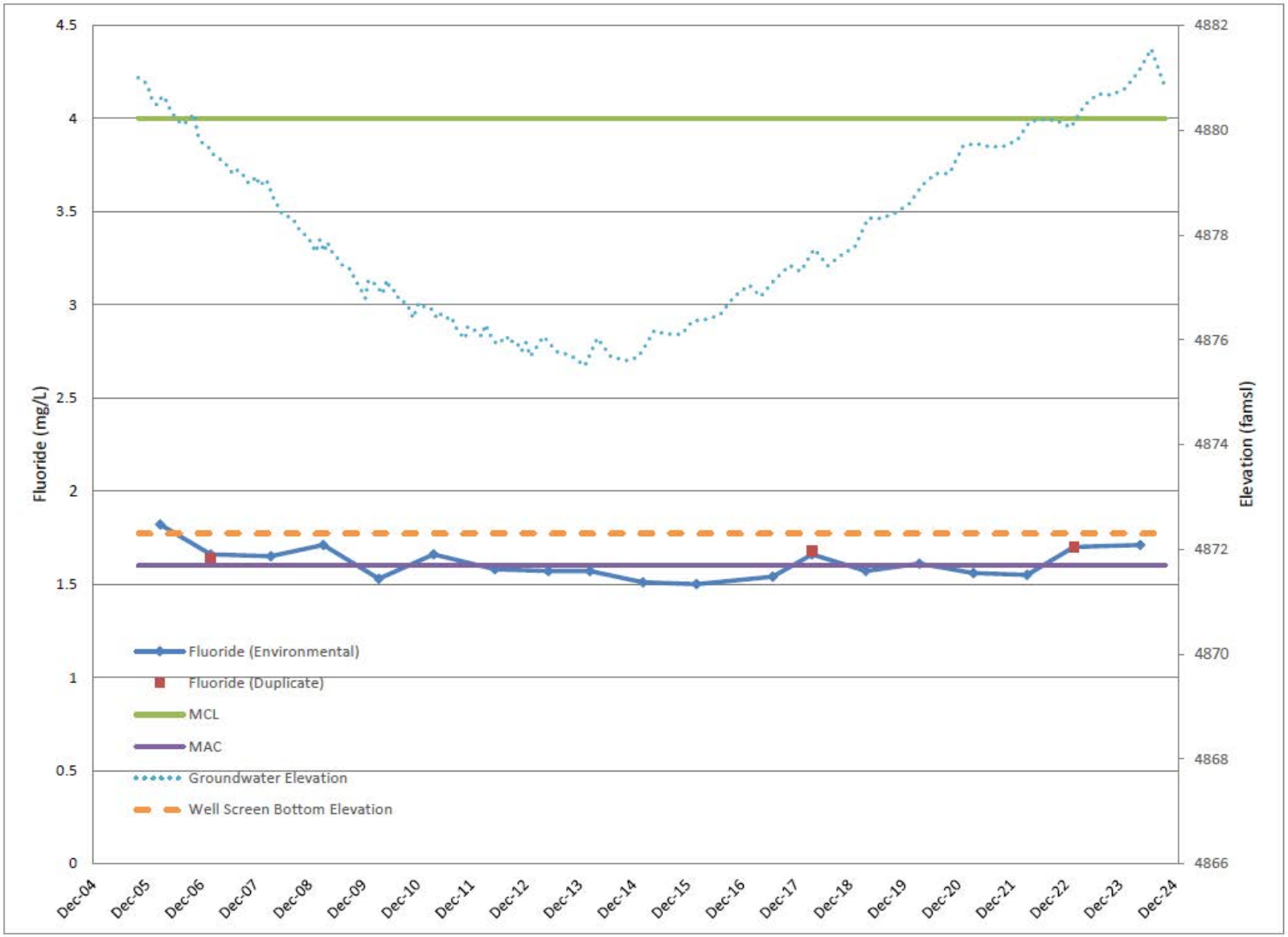


Figure 2C-3
Fluoride Concentrations, Monitoring Well SWTA3-MW4

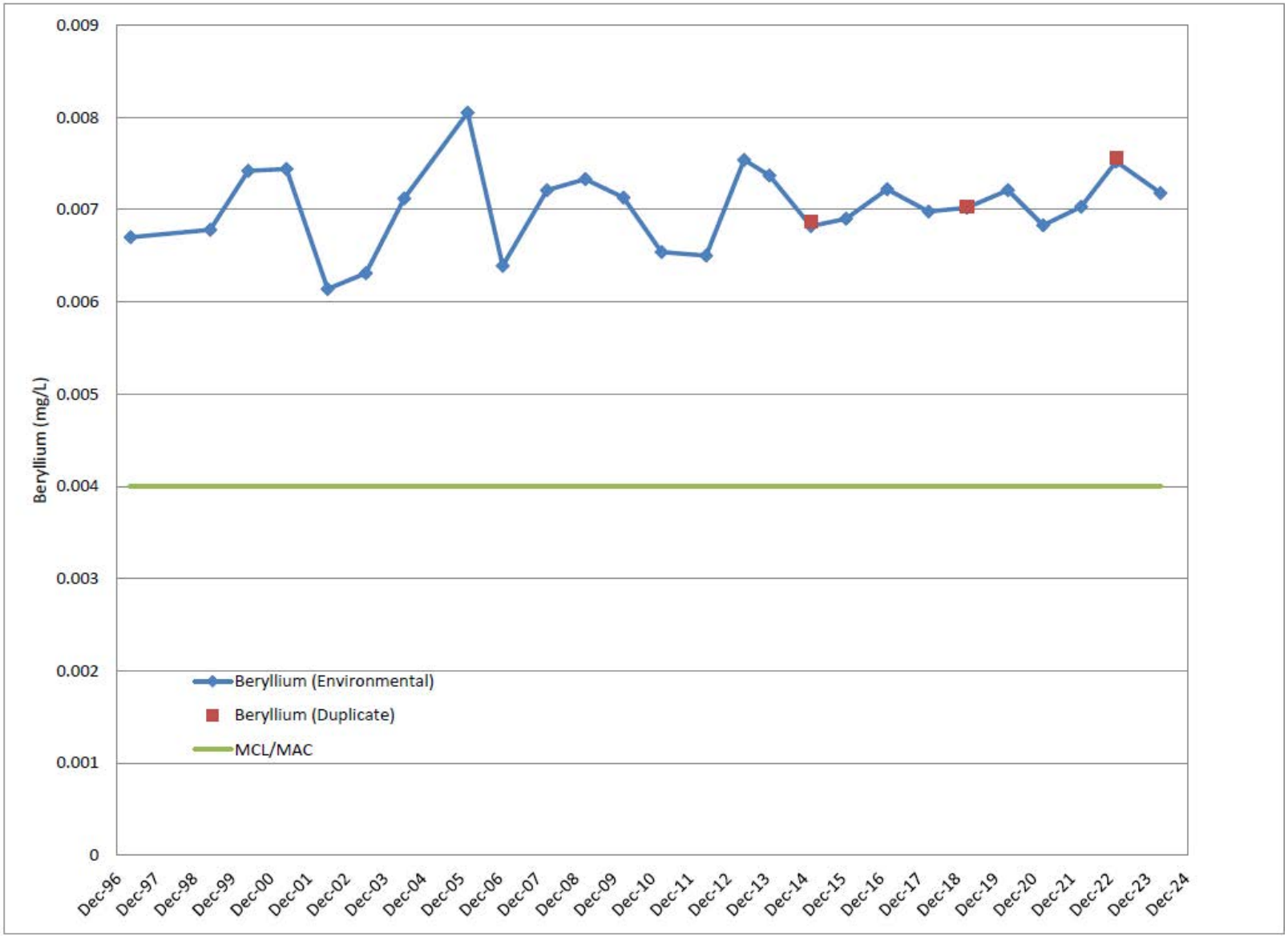


Figure 2C-4
Beryllium Concentrations, Coyote Springs

Chapter 2.0
Groundwater Monitoring Program References

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3.0 Chemical Waste Landfill

3.1 Introduction

This chapter summarizes the calendar year (CY) 2024 Chemical Waste Landfill (CWL) groundwater monitoring activities and results.

The CWL is a 1.9-acre remediated hazardous waste landfill that is located in the southeast corner of Technical Area (TA)-III at Sandia National Laboratories, New Mexico (SNL/NM) (Figure 3-1) and is undergoing post-closure care in accordance with the *Hazardous Waste Permit, EPA ID No. NM5890110518, to the U.S. Department of Energy and Sandia Corporation, for Sandia National Laboratories, Located in Bernalillo County New Mexico* (Chemical Waste Landfill Post-Closure Care Permit [CWL PCCP]) (NMED, October 2009, as modified). From 1962 to 1981, it was used to dispose of chemical and solid waste, as well as a small amount of radioactive waste, generated by SNL/NM research activities. From 1982 through 1985, it was used to dispose of solid waste only. From 1981 to 1989, it was also used as an aboveground hazardous waste drum storage facility.

In 1990, trichloroethene (TCE) was detected in the groundwater at the CWL at a concentration exceeding the U.S. Environmental Protection Agency maximum contaminant level (EPA MCL) of 5 µg/L. This finding led to the development and incorporation of a corrective action program into the *Chemical Waste Landfill Final Closure Plan and Postclosure Permit Application* (Final Closure Plan) (SNL/NM, December 1992, as modified). The SNL/NM Environmental Restoration Project implemented two voluntary corrective measures (VCMs): a vapor extraction VCM from 1996 through 1998 and a landfill excavation VCM from September 1998 through February 2002. As part of the vapor extraction VCM, the volatile organic compound (VOC) soil-gas plume was reduced and controlled, further degradation of the groundwater was prevented, and TCE concentrations in the groundwater were reduced to levels below the EPA MCL. As part of the landfill excavation VCM, all former disposal areas were excavated to industrial land use risk-based levels, as confirmed by final geophysical surveys and verification sampling. More than 52,000 yd^3 of contaminated soil and debris were removed during the landfill excavation VCM (SNL/NM, April 2003).

After backfilling activities were completed in April 2004, U.S. Department of Energy National Nuclear Security Administration and SNL/NM personnel requested approval to install an at-grade vegetative soil cover as an interim measure (DOE, April 2004) while New Mexico Environment Department (NMED) comments on the May 2003 *Chemical Waste Landfill Corrective Measures Study Report* (CWL CMS Report) (SNL/NM, December 2004) were being resolved. The NMED approved this request in September 2004 (NMED, September 2004), and installation of the at-grade evapotranspirative (ET) cover (vegetative soil cover) was completed in September 2005.

In May 2007, the NMED issued a Notice of Public Comment Period (NMED, May 2007a) for three documents: the CWL CMS Report; the *Resource Conservation and Recovery Act, Post-Closure Care Operating Permit, EPA ID No. NM5890110518, to the U.S. Department of Energy/Sandia Corporation, for the Sandia National Laboratories Chemical Waste Landfill* (NMED, May 2007b); and the *Chemical Waste Landfill Final Closure Plan – Chapter 12 Revision* (Final Closure Plan – Chapter 12 Revision) (SNL/NM, February 2006). In 2009, the NMED issued the CWL PCCP and approved the CWL CMS Report and Final Closure Plan – Chapter 12 Revision (NMED, October 2009b).

In 2010, older CWL monitoring wells CWL-MW4, CWL-MW5L, CWL-MW5U, CWL-MW6L, CWL-MW6U, and CWL-BW4A were decommissioned and new CWL monitoring wells CWL-BW5, CWL-MW9, CWL-MW10, and CWL-MW11 were installed. The new monitoring wells became the compliance groundwater monitoring network for the CWL in accordance with the Final Closure Plan – Chapter 12 Revision.

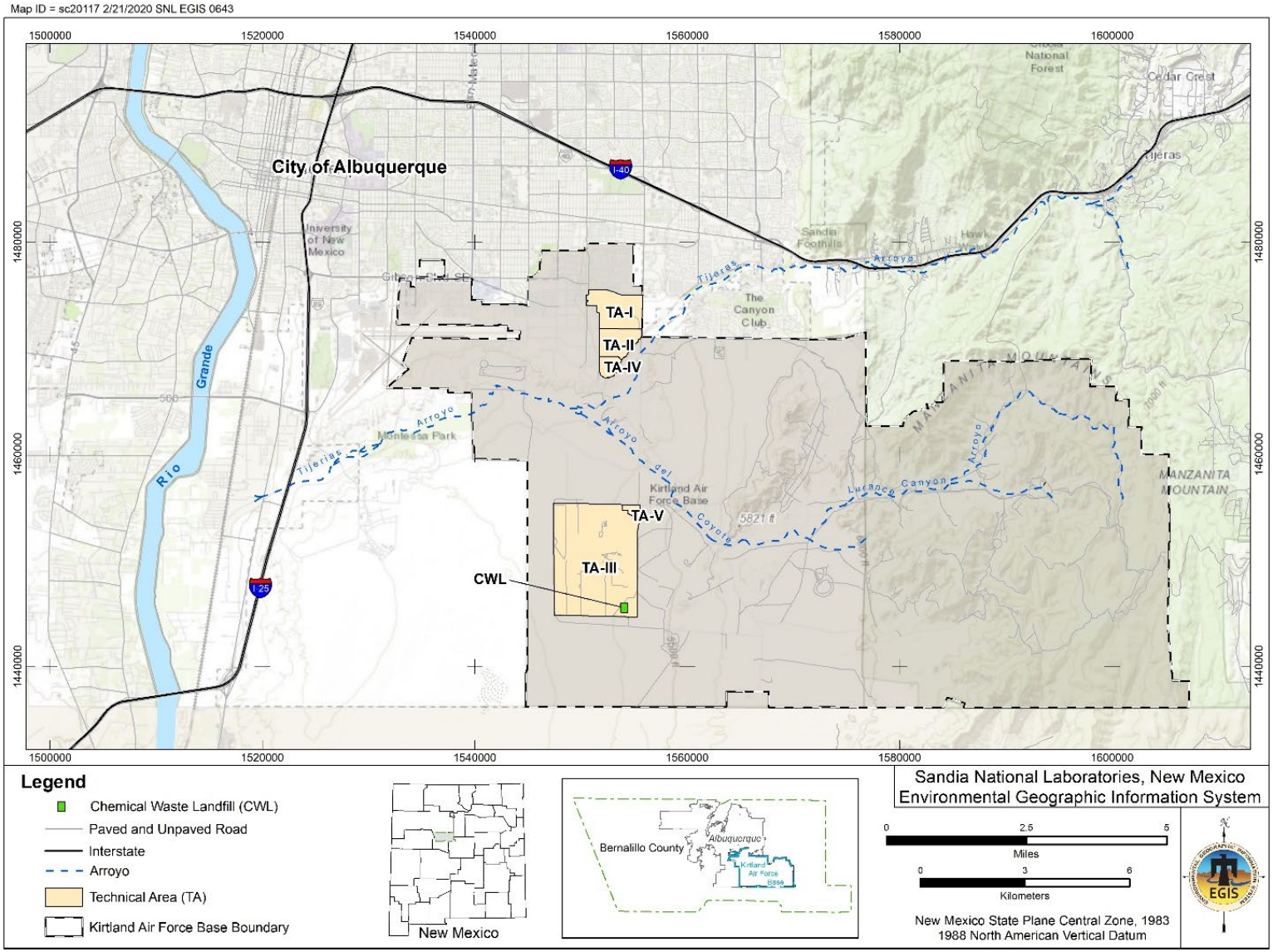


Figure 3-1
Location of the Chemical Waste Landfill with Respect to Kirtland Air Force Base and the City of Albuquerque

The *Chemical Waste Landfill Final Resource Conservation and Recovery Act Closure Report* (SNL/NM, September 2010) documenting CWL closure in accordance with the Final Closure Plan was submitted to the NMED after the monitoring well installation and decommissioning activities were completed. Upon NMED approval of CWL closure (NMED, June 2011), the CWL PCCP became the enforceable regulatory document. The CWL PCCP was issued for 10 years from the June 2, 2011 effective date in accordance with 40 CFR Part 270.50(a). An application to renew the CWL PCCP was submitted to the NMED in November 2020 (DOE, November 2020) as required. The renewal application included no operational changes to the CWL PCCP.

All CWL groundwater monitoring activities since June 2, 2011 have been performed in accordance with the CWL PCCP and documented along with the monitoring results in CWL annual post-closure care reports submitted to the NMED in March of each year. The *Chemical Waste Landfill Annual Post-Closure Care Report, Calendar Year 2023* (SNL/NM, March 2024a) was submitted to the NMED in March 2024 and approved with modifications (NMED, May 2024). The report was revised in accordance with the NMED requirements (SNL/NM, March 2024b) and was resubmitted (DOE, August 2024) and approved (NMED, September 2024). The CY 2024 CWL annual post-closure care report will be submitted to the NMED in March 2025.

3.1.1 Monitoring History

CWL groundwater monitoring began in 1985 (IT, December 1985) as required by 20.4.1.600 NMAC, incorporating 40 CFR Part 265 (NMED, December 2018b). From February 22, 1993 to June 2, 2011, the monitoring was conducted under the Final Closure Plan. Since June 2, 2011, the monitoring has been conducted under the CWL PCCP.

3.1.2 Monitoring Well Network

The CWL monitoring well network consists of four monitoring wells: CWL-BW5, CWL-MW9, CWL-MW10, and CWL-MW11. These four monitoring wells are listed in Table 3-1 and shown on Figure 3-2.

Table 3-1
Chemical Waste Landfill Monitoring Well Network and Calendar Year 2024 Compliance Activities

Well ID	Installation Year	WQ	WL	Comment
CWL-BW5	2010	✓	✓	Background well, sampled semiannually
CWL-MW9	2010	✓	✓	Downgradient well, sampled semiannually
CWL-MW10	2010	✓	✓	Downgradient well, sampled semiannually
CWL-MW11	2010	✓	✓	Downgradient well, sampled semiannually
Total	--	4	4	Total for AGMR reporting

Notes:
Check marks indicate that WQ sampling and WL measurements were completed.
AGMR = annual groundwater monitoring report
BW = Background Well
CWL = Chemical Waste Landfill
ID = identifier
MW = Monitoring Well
WL = water level
WQ = water quality

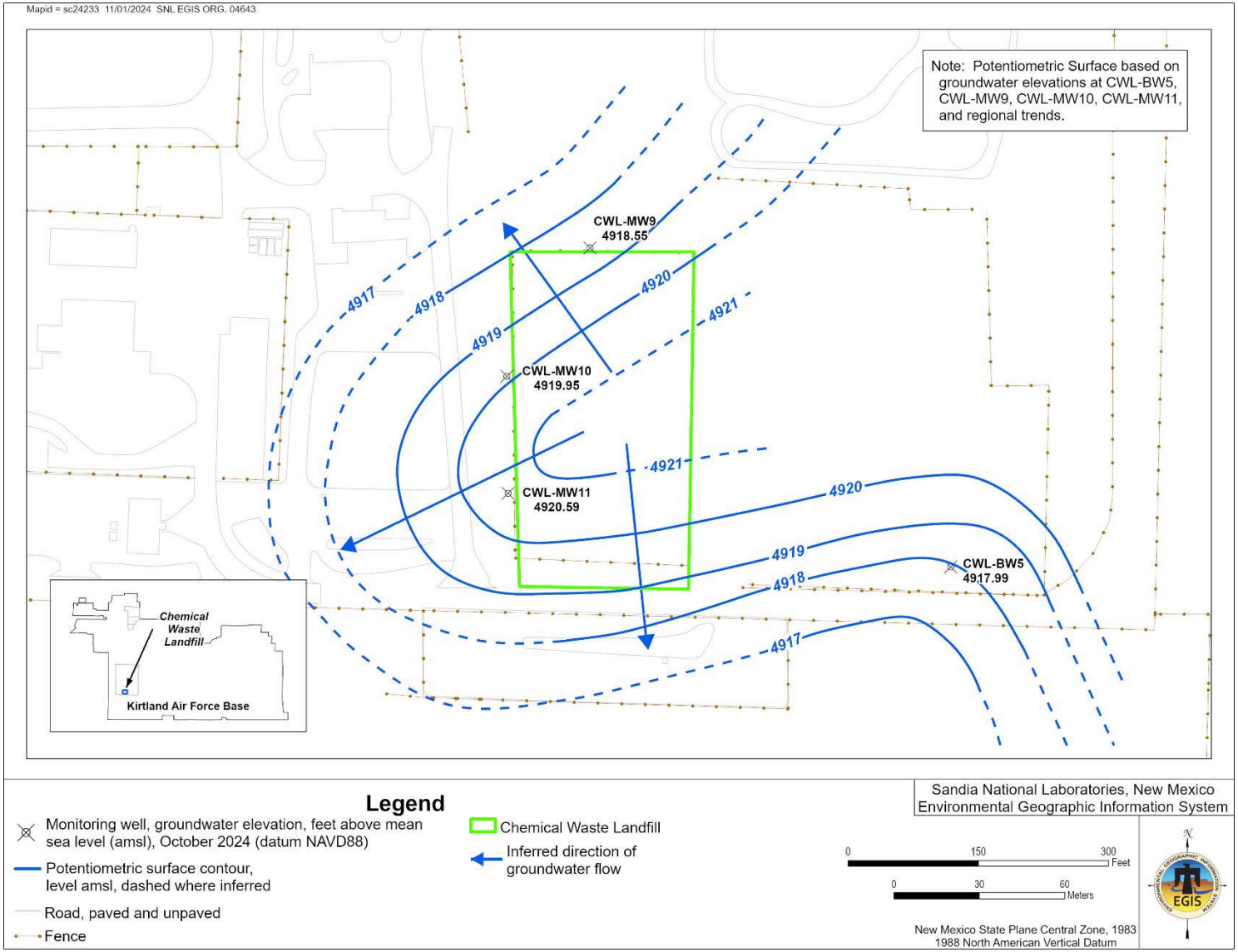


Figure 3-2
Localized Potentiometric Surface of the Regional Aquifer at the Chemical Waste Landfill, October 2024

3.1.3 Conceptual Site Model

This section summarizes the Conceptual Site Model (CSM) for the CWL. The constituents of concern in the groundwater at the CWL are TCE, chromium, and nickel. A detailed CSM is provided in Annex E of the CWL CMS Report.

The upper surface of the Regional Aquifer (water table) beneath the CWL occurs within interfingering, unconsolidated, fine-grained alluvial fan deposits of the Santa Fe Group (SFG). The depth to water is approximately 500 ft bgs. The groundwater generally flows westward from the Manzanita Mountains toward the Rio Grande. Several Kirtland Air Force Base (KAFB), Veterans Affairs, and Albuquerque Bernalillo County Water Utility Authority (ABCWUA) production wells have profoundly modified the natural groundwater flow regime to the west and north of the CWL by creating a trough in the water table in the western and northern parts of KAFB. As a result, groundwater elevations at the CWL have been steadily declining since 1985 at variable rates but typically between 0.4 to 0.8 ft/yr.

The CWL hydrograph (Attachment 3A, Figure 3A-1) presents the groundwater elevations for the CWL monitoring wells. The hydrograph shows the rate of groundwater elevation decline from 2010 to 2024. The decline rate from October 2023 to October 2024 ranged from 0.31 ft (CWL-MW11) to 0.56 ft (CWL-BW5) and was slightly more than the decline rate from October 2022 to October 2023, which ranged from 0.16 ft (CWL-MW9) to 0.36 ft (CWL-MW11). Overall, the decline rate has slowed, likely due to decreased pumping by ABCWUA production wells to the north. Recharge from the infiltration of direct precipitation at the CWL is negligible due to high evapotranspiration, low precipitation, the thick sequence of unsaturated SFG deposits above the water table, and the ET cover that was installed in 2005. Groundwater recharge of the Regional Aquifer primarily occurs by the infiltration of precipitation in the Manzanita Mountains located approximately 5 mi to the east and has been affected by extended drought conditions that continued in 2024.

Table 3-2 presents the groundwater elevation data used to construct the CY 2024 potentiometric surface map of the CWL monitoring well network (Figure 3-2).

Table 3-2
Groundwater Elevation Data for Chemical Waste Landfill Monitoring Wells Completed in the Regional Aquifer, October 2024

Well ID	Measurement Point (ft amsl) NAVD 88	Date Measured	Depth to Water (ft btoc)	Groundwater Elevation (ft amsl)
CWL-BW5	5,434.79	1-Oct-2024	516.80	4,917.99
CWL-MW9	5,426.12	1-Oct-2024	507.57	4,918.55
CWL-MW10	5,424.58	1-Oct-2024	504.63	4,919.95
CWL-MW11	5,423.24	1-Oct-2024	502.65	4,920.59

Notes:
amsl = above mean sea level
btoc = below top of casing
BW = Background Well
CWL = Chemical Waste Landfill
ft = feet
ID = identifier
MW = Monitoring Well
NAVD 88 = North American Vertical Datum of 1988

Figure 3-2 is consistent with the CSM and the site-wide potentiometric surface map (Plate 1). As Plate 1 shows, the potentiometric surface contours beneath TA-III generally trend north to south with the inferred groundwater flow direction being generally westward. The westward deflection of the potentiometric surface is a localized salient (a very gentle ridge or localized high) of the Regional Aquifer beneath the CWL (Figure 3-2) that reflects site-specific geologic controls. These controls are related to lateral and vertical changes in the hydraulic conductivity of the saturated, anisotropic, SFG alluvial-fan sediments

that were predominantly deposited in an east-to-west direction. The nearest production well, KAFB-4, is located approximately 4.3 mi northwest of the CWL.

Measured orthogonally from the potentiometric surface contours on Figure 3-2 across the site, the horizontal gradient at the CWL has not changed significantly from previous years and is approximately 0.013 ft/ft. Groundwater velocities in the alluvial-fan sediments were calculated using the current potentiometric surface gradient, the hydraulic conductivity range (high and low values) from slug tests conducted in 2012 on all four CWL monitoring wells, and a porosity of 29% as determined from laboratory analyses of CWL sediment samples (SNL/NM, October 1995). The calculated velocities are the same as those reported since CY 2014 and range from approximately 1.8×10^{-4} to 2.8×10^{-3} ft/day. This is equivalent to approximately 0.07 to 1.02 ft/yr. These very low values are consistent with historical estimates for horizontal groundwater flow at the water table in the vicinity of the CWL. Estimated groundwater travel times from the CWL to the nearest production wells to the north are on the order of hundreds to thousands of years (SNL/NM, February 2001).

3.2 Regulatory Requirements

CWL groundwater monitoring is subject to the CWL PCCP, which took effect on June 2, 2011. CWL PCCP Attachment 1, Section 1.8.1, and Attachment 2, Groundwater Sampling and Analysis Plan, detail the groundwater monitoring requirements, procedures, and protocols. Per the CWL PCCP, the regulatory standards for the analytical results are the CWL PCCP hazardous constituent concentration limits (CWL PCCP Attachment 1, Table 1-2). However, these NMED-defined regulatory standards apply only to a statistical evaluation of the data set from a given monitoring well (the 95th percentile lower confidence limit of the mean for a particular analyte), not to individual analytical results. Therefore, for the purposes of this Report, the individual analytical results are compared to the EPA MCLs (EPA, March 2018), where established. The CY 2024 CWL annual post-closure care report will provide a comprehensive statistical evaluation of the analytical results, with comparison of the results to the CWL PCCP hazardous constituent concentration limits.

3.3 Scope of Activities

CY 2024 CWL groundwater monitoring activities included semiannual collection and analysis of groundwater samples from four CWL monitoring wells (CWL-BW5, CWL-MW9, CWL-MW10, and CWL-MW11) in January and July 2024 in accordance with the CWL PCCP. The January 2024 samples were analyzed for TCE, chromium, nickel, and the enhanced list of VOCs (1,1-dichloroethene; 1,1,2-trichloro-1,2,2-trifluoroethane; chloroform; tetrachloroethene; and trichlorofluoromethane). The July 2024 samples were analyzed for TCE, chromium, and nickel. Table 3-3 lists the analytes for each monitoring well for each sampling event.

Table 3-3
Analytes for Chemical Waste Landfill Monitoring Wells, Calendar Year 2024

Analytes	Sampling Event	Monitoring Wells
VOCs: TCE 1,1,2-Trichloro-1,2,2-trifluoroethane Tetrachloroethene 1,1-Dichloroethene Chloroform Trichlorofluoromethane	January	CWL-BW5 CWL-BW5 (Duplicate) CWL-MW9 CWL-MW10 CWL-MW11
Metals: Chromium Nickel		
VOCs: TCE	July	CWL-BW5 CWL-MW9 CWL-MW9 (Duplicate) CWL-MW10 CWL-MW11
Metals: Chromium Nickel		

Notes:
BW = Background Well
CWL = Chemical Waste Landfill
MW = Monitoring Well
TCE = trichloroethene
VOC = volatile organic compound

3.4 Field Procedures and Measurements

Field water quality parameters and water levels were measured in accordance with the CWL PCCP and the procedures and methods Chapter 1.0, Section 1.3 describes.

The purging requirements for the CWL (CWL PCCP Attachment 2, Section 2.12) include specifications for pumping at low flow rates such that low-yield monitoring wells do not purge dry. These specifications include equipping the portable Bennett groundwater sampling system with small-diameter tubing and a flow meter valve along the discharge line. In addition, during the purging process at monitoring wells prone to purge dry, the flow rate is continually adjusted to achieve as low a flow rate as possible without damaging the pump or causing it to fail due to overheating (the slowest rate possible given equipment limitations).

Two of the four monitoring wells (CWL-BW5 and CWL-MW9) met the minimum purge volume requirement during both sampling events. Monitoring wells CWL-MW10 (January and July 2024) and CWL-MW11 (January 2024) purged dry before the minimum purge volume (one saturated casing volume) was removed. Both monitoring wells were allowed to recover and then were sampled to ensure collection of the most representative groundwater samples possible given the low yields.

In January 2024, approximately 11 gal were removed from monitoring well CWL-MW10 and approximately 17 gal were removed from monitoring well CWL-MW11 before the wells purged dry (purge volume requirement for both wells was approximately 20 gal). At CWL-MW10, the average estimated flow rate for the purging event was 0.106 gpm and the estimated flow rate during the final 3 gal was 0.094 gpm (equivalent to 0.401 and 0.356 L/min, respectively). At CWL-MW11, the average estimated flow rate for the purging event was 0.108 gpm and the estimated flow rate during the final 3 gal was 0.097 gpm (equivalent to 0.409 and 0.367 L/min, respectively). In July 2024, approximately 10.75 gal were removed from CWL-MW10 before the well purged dry (purge volume requirement was approximately 19 gal). The average estimated flow rate for the purging event was 0.079 gpm and the estimated flow rate during the final 0.15 gal was 0.064 gpm (equivalent to 0.300 and 0.242 L/min, respectively).

3.5 Analytical Methods

The analytical laboratory analyzed the groundwater samples using the applicable EPA-specified methods and protocols identified in Chapter 1.0, Section 1.3.2 (Table 1-5).

3.6 Summary of Calendar Year 2024 Groundwater Monitoring Results

The following sections summarize the CY 2024 CWL groundwater monitoring results. Attachment 3A (Figure 3A-1) presents the CWL hydrograph. Attachment 3B (Tables 3B-1 through 3B-3) presents the analytical results and field water quality parameter measurements for both sampling events. The analytical results were reviewed and qualified during data validation and include the laboratory and validation qualifiers. The analytical results and analytical laboratory data packages (Data Package 2) were submitted to the SNL/NM Customer Funded Records Center for retention.

3.6.1 Analytical Results

No analytes were detected at concentrations exceeding the EPA MCLs or CWL PCCP hazardous constituent concentration limits, and the results are consistent with historical results.

3.6.1.1 Volatile Organic Compounds

Table 3B-1 presents the TCE results (January and July 2024) and VOC (enhanced list) results (January 2024). TCE was detected in the January and July 2024 CWL-MW10 environmental samples at estimated concentrations (J-qualified) ranging from 0.850 to 0.860 µg/L. These results are below the EPA MCL of 5.0 µg/L. No other VOCs were detected. Since implementation of the CWL PCCP in June 2011, TCE has been the only VOC detected in CWL groundwater samples, and it has only been detected in CWL-MW10 groundwater samples. Since January 2015, the concentrations in such samples have mostly been below 1 µg/L, indicating that the two VCMs implemented from 1996 through 2002 were effective.

3.6.1.2 Metals

Table 3B-2 presents the chromium and nickel results. Chromium was not detected in the January or July 2024 samples. Nickel was detected in the CWL-MW10 environmental samples at estimated concentrations ranging from 0.00108 to 0.00142 mg/L. Nickel was not detected in any other samples.

3.6.2 Field Water Quality Parameter Measurements

Table 3B-3 presents the field water quality parameter measurements obtained at the end of purging and before sample collection (Chapter 1.0, Section 1.3.1.2) at each monitoring well. The field water quality parameters measured consisted of temperature, specific conductivity, oxidation-reduction potential, potential of hydrogen, and dissolved oxygen. These parameters were measured to evaluate water chemistry stability and ensure the collection of representative groundwater samples.

3.7 Quality Control Results

The following sections summarize the CY 2024 field and laboratory quality control (QC) sample results and their impact on data quality. Chapter 1.0, Section 1.3 describes how the field and laboratory QC samples were collected and prepared. Table 1-7 (Chapter 1.0, Section 1.3.4) lists each field and laboratory QC sample type and purpose.

3.7.1 Field Quality Control Samples

The field QC samples included environmental duplicate, equipment blank, field blank, and trip blank samples.

3.7.1.1 Environmental Duplicate Samples

Environmental duplicate samples were collected from monitoring wells CWL-BW5 (January 2024) and CWL-MW9 (July 2024) and were analyzed for all analytes (Table 3-3). No analytes were detected in the January or July 2024 sample pair; therefore, no relative percent difference (RPD) was calculated.

3.7.1.2 Equipment Blank Samples

One equipment blank sample associated with monitoring well CWL-BW5 was collected in January 2024 before sampling of the well began and was analyzed for TCE, chromium, nickel, and the enhanced list of VOCs. Chloroform was detected in the equipment blank sample; however, no corrective action was necessary because chloroform was not detected in the associated environmental sample.

One equipment blank sample associated with monitoring well CWL-MW9 was collected in July 2024 before sampling of the well began and was analyzed for TCE, chromium, and nickel. No analytes were detected in the equipment blank sample.

3.7.1.3 Field Blank Samples

Three field blank samples were collected in January 2024 at monitoring wells CWL-BW5, CWL-MW10, and CWL-MW11 and were analyzed for TCE and the enhanced list of VOCs. Chloroform was the only VOC detected in the field blank samples; however, no corrective action was necessary because chloroform was not detected in the associated environmental samples.

Two field blank samples were collected in July 2024 at monitoring wells CWL-MW10 and CWL-MW11 and were analyzed for TCE. No TCE was detected in the field blank samples.

During each sampling event, a field blank sample was collected from the deionized water used for decontamination and equipment blank sample collection and was analyzed for all analytes (Table 3-3). The field blank sample results were used to internally verify the quality of the deionized water but were not used during data validation to qualify environmental or field QC sample results.

3.7.1.4 Trip Blank Samples

Six trip blank samples were submitted in January 2024 and were analyzed for TCE and the enhanced list of VOCs. Six trip blank samples were submitted in July 2024 and were analyzed for TCE. No VOCs were detected in the January or July 2024 trip blank samples.

3.7.2 Laboratory Quality Control Samples

The laboratory QC samples included laboratory control, method blank, matrix spike and matrix spike duplicate, surrogate spike, and replicate samples. They were analyzed concurrently with the groundwater and field QC samples in accordance with laboratory procedures and EPA methods. Corrective action was implemented in accordance with the applicable data validation procedure and included the qualification of results as Attachment 3B, Tables 3B-1 and 3B-2 detail. In summary, the 1,1,2-trichloro-1,2,2-trifluoroethane results for the January 2024 CWL-BW5 environmental and environmental duplicate samples were qualified during data validation as estimated non-detections (UJ-qualified) because the matrix spike/matrix spike duplicate RPD was greater than the acceptance criteria. There were no laboratory QC sample issues associated with the July 2024 sample results.

3.8 Variances and Nonconformances

All CY 2024 CWL groundwater monitoring activities were performed in accordance with the CWL PCCP, with no variances or nonconformances identified. All environmental and QC sample results were reviewed and qualified and met the data quality objectives and analytical method and laboratory procedure requirements.

3.9 Summary and Conclusions

Groundwater samples were collected from four CWL monitoring wells (CWL-BW5, CWL-MW9, CWL-MW10, and CWL-MW11) in January and July 2024 in accordance with the CWL PCCP. The January 2024 samples were analyzed for TCE, chromium, nickel, and the enhanced list of VOCs. The July 2024 samples were analyzed for TCE, nickel, and chromium. No analytes were detected at concentrations exceeding the EPA MCLs or CWL PCCP hazardous constituent concentration limits, and the results are consistent with historical results.

3.10 Summary of Future Activities

Per the CWL PCCP, the post-closure care period for the CWL is 30 years and the compliance period for which the groundwater protection standard applies is 47 years; both periods began on June 2, 2011 when the NMED approved CWL closure. The NMED may shorten or extend the post-closure care period under 20.4.1.500 NMAC, incorporating 40 CFR Part 264.117(a)(2) (NMED, December 2018a).

All CWL monitoring, inspection, and maintenance activities will continue to be performed and documented in accordance with the CWL PCCP.

In accordance with the CWL PCCP, CWL groundwater monitoring will continue on a semiannual basis, with the groundwater monitoring results documented in the CWL annual post-closure care reports submitted to the NMED in March of each year. To eliminate dual reporting not required by the CWL PCCP or the Consent Order, CWL groundwater monitoring results will not be included in future annual groundwater monitoring reports.

Attachment 3A
Chemical Waste Landfill Hydrograph

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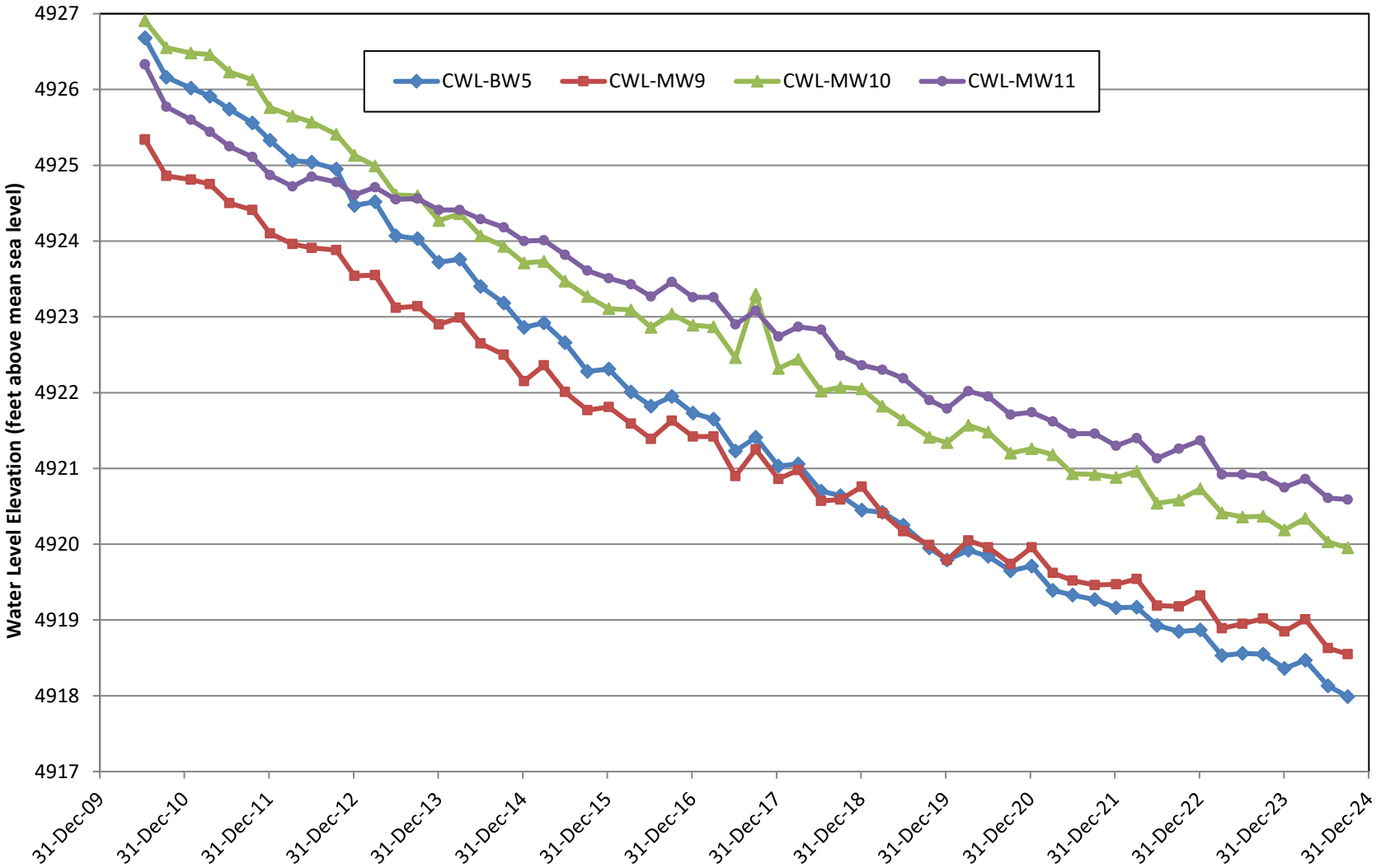


Figure 3A-1
Chemical Waste Landfill Groundwater Monitoring Wells

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Attachment 3B
Chemical Waste Landfill Analytical Results Tables

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Attachment 3B Tables

Table 3B-1 Summary of Volatile Organic Compound Results, Chemical Waste Landfill Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 3B-5

Table 3B-2 Summary of Chromium and Nickel Results, Chemical Waste Landfill Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 3B-7

Table 3B-3 Summary of Field Water Quality Parameter Measurements, Chemical Waste Landfill Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 3B-8

Notes for Chemical Waste Landfill Analytical Results Tables 3B-9

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Table 3B-1
Summary of Volatile Organic Compound Results, Chemical Waste Landfill Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (µg/L)	MDL[b] (µg/L)	PQL[c] (µg/L)	MCL[d] (µg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CWL-BW5	Chloroform	ND	0.333	1.00	80.0	U		121633-001	SW846-8260D
15-Jan-24	1,1-Dichloroethene	ND	0.333	1.00	7.00	U		121633-001	SW846-8260D
	Tetrachloroethene	ND	0.333	1.00	5.00	U		121633-001	SW846-8260D
	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	2.98	5.00	NE	U, *	UJ	121633-001	SW846-8260D
	Trichloroethene	ND	0.333	1.00	5.00	U		121633-001	SW846-8260D
	Trichlorofluoromethane	ND	0.333	1.00	NE	U		121633-001	SW846-8260D
CWL-BW5	Chloroform	ND	0.333	1.00	80.0	U		121634-001	SW846-8260D
15-Jan-24	1,1-Dichloroethene	ND	0.333	1.00	7.00	U		121634-001	SW846-8260D
(Duplicate)	Tetrachloroethene	ND	0.333	1.00	5.00	U		121634-001	SW846-8260D
	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	2.98	5.00	NE	U, *	UJ	121634-001	SW846-8260D
	Trichloroethene	ND	0.333	1.00	5.00	U		121634-001	SW846-8260D
	Trichlorofluoromethane	ND	0.333	1.00	NE	U		121634-001	SW846-8260D
CWL-MW9	Chloroform	ND	0.333	1.00	80.0	U		121636-001	SW846-8260D
16-Jan-24	1,1-Dichloroethene	ND	0.333	1.00	7.00	U		121636-001	SW846-8260D
	Tetrachloroethene	ND	0.333	1.00	5.00	U		121636-001	SW846-8260D
	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	2.98	5.00	NE	U		121636-001	SW846-8260D
	Trichloroethene	ND	0.333	1.00	5.00	U		121636-001	SW846-8260D
	Trichlorofluoromethane	ND	0.333	1.00	NE	U		121636-001	SW846-8260D
CWL-MW10	Chloroform	ND	0.333	1.00	80.0	U		121653-001	SW846-8260D
22-Jan-24	1,1-Dichloroethene	ND	0.333	1.00	7.00	U		121653-001	SW846-8260D
	Tetrachloroethene	ND	0.333	1.00	5.00	U		121653-001	SW846-8260D
	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	2.98	5.00	NE	U		121653-001	SW846-8260D
	Trichloroethene	0.850	0.333	1.00	5.00	J		121653-001	SW846-8260D
	Trichlorofluoromethane	ND	0.333	1.00	NE	U		121653-001	SW846-8260D
CWL-MW11	Chloroform	ND	0.333	1.00	80.0	U		121649-001	SW846-8260D
18-Jan-24	1,1-Dichloroethene	ND	0.333	1.00	7.00	U		121649-001	SW846-8260D
	Tetrachloroethene	ND	0.333	1.00	5.00	U		121649-001	SW846-8260D
	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	2.98	5.00	NE	U		121649-001	SW846-8260D
	Trichloroethene	ND	0.333	1.00	5.00	U		121649-001	SW846-8260D
	Trichlorofluoromethane	ND	0.333	1.00	NE	U		121649-001	SW846-8260D

See notes at end of tables.

Table 3B-1 (concluded)
Summary of Volatile Organic Compound Results, Chemical Waste Landfill Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (µg/L)	MDL[b] (µg/L)	PQL[c] (µg/L)	MCL[d] (µg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CWL-BW5 15-Jul-24	Trichloroethene	ND	0.333	1.00	5.00	U		122775-001	SW846-8260D
CWL-MW9 16-Jul-24	Trichloroethene	ND	0.333	1.00	5.00	U		122782-001	SW846-8260D
CWL-MW9 (Duplicate) 16-Jul-24	Trichloroethene	ND	0.333	1.00	5.00	U		122783-001	SW846-8260D
CWL-MW10 19-Jul-24	Trichloroethene	0.860	0.333	1.00	5.00	J		122787-001	SW846-8260D
CWL-MW11 17-Jul-24	Trichloroethene	ND	0.333	1.00	5.00	U		122792-001	SW846-8260D

See notes at end of tables.

Table 3B-2
Summary of Chromium and Nickel Results, Chemical Waste Landfill Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL[d] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CWL-BW5	Chromium	ND	0.00300	0.0100	0.100	U		121633-002	SW846-6020B
15-Jan-24	Nickel	ND	0.000600	0.00200	NE	U		121633-002	SW846-6020B
CWL-BW5 (Duplicate)	Chromium	ND	0.00300	0.0100	0.100	U		121634-002	SW846-6020B
15-Jan-24	Nickel	ND	0.000600	0.00200	NE	U		121634-002	SW846-6020B
CWL-MW9	Chromium	ND	0.00300	0.0100	0.100	U		121636-002	SW846-6020B
16-Jan-24	Nickel	ND	0.000600	0.00200	NE	U		121636-002	SW846-6020B
CWL-MW10	Chromium	ND	0.00300	0.0100	0.100	U		121653-002	SW846-6020B
22-Jan-24	Nickel	0.00108	0.000600	0.00200	NE	J		121653-002	SW846-6020B
CWL-MW11	Chromium	ND	0.00300	0.0100	0.100	U		121649-002	SW846-6020B
18-Jan-24	Nickel	ND	0.000600	0.00200	NE	U		121649-002	SW846-6020B
CWL-BW5	Chromium	ND	0.00300	0.0100	0.100	U		122775-002	SW846-6020B
15-Jul-24	Nickel	ND	0.000600	0.00200	NE	U		122775-002	SW846-6020B
CWL-MW9	Chromium	ND	0.00300	0.0100	0.100	U		122782-002	SW846-6020B
16-Jul-24	Nickel	ND	0.000600	0.00200	NE	U		122782-002	SW846-6020B
CWL-MW9 (Duplicate)	Chromium	ND	0.00300	0.0100	0.100	U		122783-002	SW846-6020B
16-Jul-24	Nickel	ND	0.000600	0.00200	NE	U		122783-002	SW846-6020B
CWL-MW10	Chromium	ND	0.00300	0.0100	0.100	U		122787-002	SW846-6020B
19-Jul-24	Nickel	0.00142	0.000600	0.00200	NE	J		122787-002	SW846-6020B
CWL-MW11	Chromium	ND	0.00300	0.0100	0.100	U		122792-002	SW846-6020B
17-Jul-24	Nickel	ND	0.000600	0.00200	NE	U		122792-002	SW846-6020B

See notes at end of tables.

Table 3B-3
Summary of Field Water Quality Parameter Measurements, Chemical Waste Landfill Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Sample Date	Temperature[h] (^{0}C)	Specific Conductivity[h] (µmho/cm)	Oxidation Reduction Potential[h] (mV)	pH[h]	Turbidity[h] (NTU)	Dissolved Oxygen[h] (% Sat)	Dissolved Oxygen[h] (mg/L)
CWL-BW5	15-Jan-24	17.00	1013.8	216.4	6.92	0.50	83.18	6.49
CWL-MW9	16-Jan-24	18.14	933.72	128.8	6.98	0.43	63.29	4.83
CWL-MW10	22-Jan-24	15.69	883.35	-86.0	7.04	0.84	10.60	0.85
CWL-MW11	18-Jan-24	17.70	969.19	145.2	6.92	0.06	74.33	5.72
CWL-BW5	15-Jul-24	22.24	1236.7	111.7	6.98	0.30	87.33	6.26
CWL-MW9	16-Jul-24	22.32	1124.3	119.2	7.05	0.42	63.79	4.60
CWL-MW10	19-Jul-24	21.81	667.63	7.3	6.76	1.01	83.46	6.02
CWL-MW11	17-Jul-24	28.74	1170.3	16.0	7.00	0.77	76.08	4.83

See notes at end of tables.

Notes for Chemical Waste Landfill Analytical Results Tables

% = percent
EPA = U.S. Environmental Protection Agency
ID = identifier
µg/L = micrograms per liter
mg/L = milligrams per liter
No. = number

[a]Result
ND = not detected (at MDL)

[b]MDL
Method detection limit. The minimum concentration or activity that can be measured and reported with 99% confidence that the analyte is greater than zero, analyte is matrix specific.

[c]PQL
Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.

[d]MCL
MCL = Maximum contaminant level. Established by the EPA Office of Water, National Primary Drinking Water Standards (EPA March 2018). The total for trihalomethanes, including chloroform, is 80 mg/L.
NE = not established

[e]Laboratory Qualifier
If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.
J = Amount detected is below the PQL.
U = Analyte is absent or below the MDL.
* = Recovery or % relative percent difference (RPD) not within acceptance limits and/or spike amount not compatible with the sample or the duplicate RPD's are not applicable where the concentration falls below the effective PQL.

[f]Validation Qualifier
If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.
UJ = The analyte was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

[g]Analytical Method Reference
U.S. Environmental Protection Agency. (1986, as updated). *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, 3rd ed., Rev.1

[h]Field Water Quality Parameter Measurements
Field measurements obtained prior to sampling.
^{O}C = degrees Celsius
% Sat = percent saturation
µmho/cm = micromhos per centimeter
mg/L = milligrams per liter
mV = millivolts
NTU = nephelometric turbidity units
pH = potential of hydrogen (negative logarithm of the hydrogen ion concentration)

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Chapter 3.0
Chemical Waste Landfill References

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4.0 Mixed Waste Landfill

4.1 Introduction

This chapter summarizes the calendar year (CY) 2024 Mixed Waste Landfill (MWL) groundwater monitoring activities and results.

The MWL is a 2.6-acre Solid Waste Management Unit (SWMU) located in the north-central part of Technical Area-III at Sandia National Laboratories, New Mexico (SNL/NM) (Figure 4-1). It consists of two distinct disposal areas, a classified area occupying 0.6 acres and an unclassified area occupying 2.0 acres, that received low-level radioactive, hazardous, and mixed wastes from March 1959 through December 1988. It underwent corrective action in accordance with the *Compliance Order on Consent Pursuant to the New Mexico Hazardous Waste Act 74-4-10: Sandia National Laboratories Consent Order* (NMED, April 2004) and was granted Corrective Action Complete with Controls status on March 13, 2016 (NMED, February 2016a). It has been monitored in accordance with the *Long-Term Monitoring and Maintenance Plan for the Mixed Waste Landfill* (MWL LTMMP) (SNL/NM, March 2012, as modified) since January 8, 2014.

The Phase 1 Resource Conservation and Recovery Act Facility Investigation (RFI) of the MWL was completed in 1990 (SNL/NM, September 1990) and the Phase 2 RFI of the MWL was completed in 1995 (Peace et al., 2002). The Phase 2 RFI confirmed tritium as the primary constituent of concern at the MWL. After resolution of all New Mexico Environment Department (NMED) comments on the *Report of the Mixed Waste Landfill Phase 2 RCRA Facility Investigation* (Peace et al., 2002), the *Mixed Waste Landfill Corrective Measures Study Final Report* (SNL/NM, May 2003) was prepared and submitted to the NMED. The NMED selected a vegetative cover with a biointrusion barrier (evapotranspirative [ET] cover) as the final remedy for the MWL (NMED, May 2005). ET cover construction was completed in 2009 in accordance with the NMED-approved *Mixed Waste Landfill Corrective Measures Implementation Plan* (SNL/NM, November 2005; NMED, December 2008). The *Mixed Waste Landfill Corrective Measures Implementation Report* (SNL/NM, January 2010), which documented the ET cover construction, was submitted to the NMED and approved (NMED, October 2011).

Per the May 2005 NMED Final Order (NMED, May 2005), the MWL LTMMP was submitted to the NMED and approved (NMED, January 2014). All MWL LTMMP monitoring, maintenance, repair, and reporting requirements, including installation of the three multiport soil-vapor monitoring wells required to complete the LTMMP monitoring systems, were implemented upon NMED approval. After the NMED approved the soil-vapor monitoring well installation report (SNL/NM, September 2014; NMED, September 2014), U.S. Department of Energy National Nuclear Security Administration (DOE/NNSA) and SNL/NM personnel requested a Certification of Completion (DOE, September 2014), which the NMED granted (NMED, October 2014).

In October 2014, DOE/NNSA and SNL/NM personnel submitted to the NMED a *Request for Class 3 Permit Modification to Module IV of Hazardous Waste Permit for Sandia National Laboratories/New Mexico, EPA ID NM5890110518, New Mexico* (DOE, October 2014) for Corrective Action Complete with Controls status for the MWL. The associated regulatory process included two public comment periods, a public meeting held by DOE/NNSA and SNL/NM personnel in November 2014, and a four-day public hearing held by the NMED in July 2015.

On March 13, 2016, the February 2016 NMED Final Order (NMED, February 2016a) took effect (NMED, February 2016b), granting Corrective Action Complete with Controls status to the MWL and incorporating the MWL LTMMP into the *Resource Conservation and Recovery Act Facility Operating Permit for Sandia National Laboratories, EPA ID No. NM5890110518* (RCRA Permit) (NMED, January 2015, as modified). The MWL LTMMP defines the groundwater monitoring requirements for the MWL.

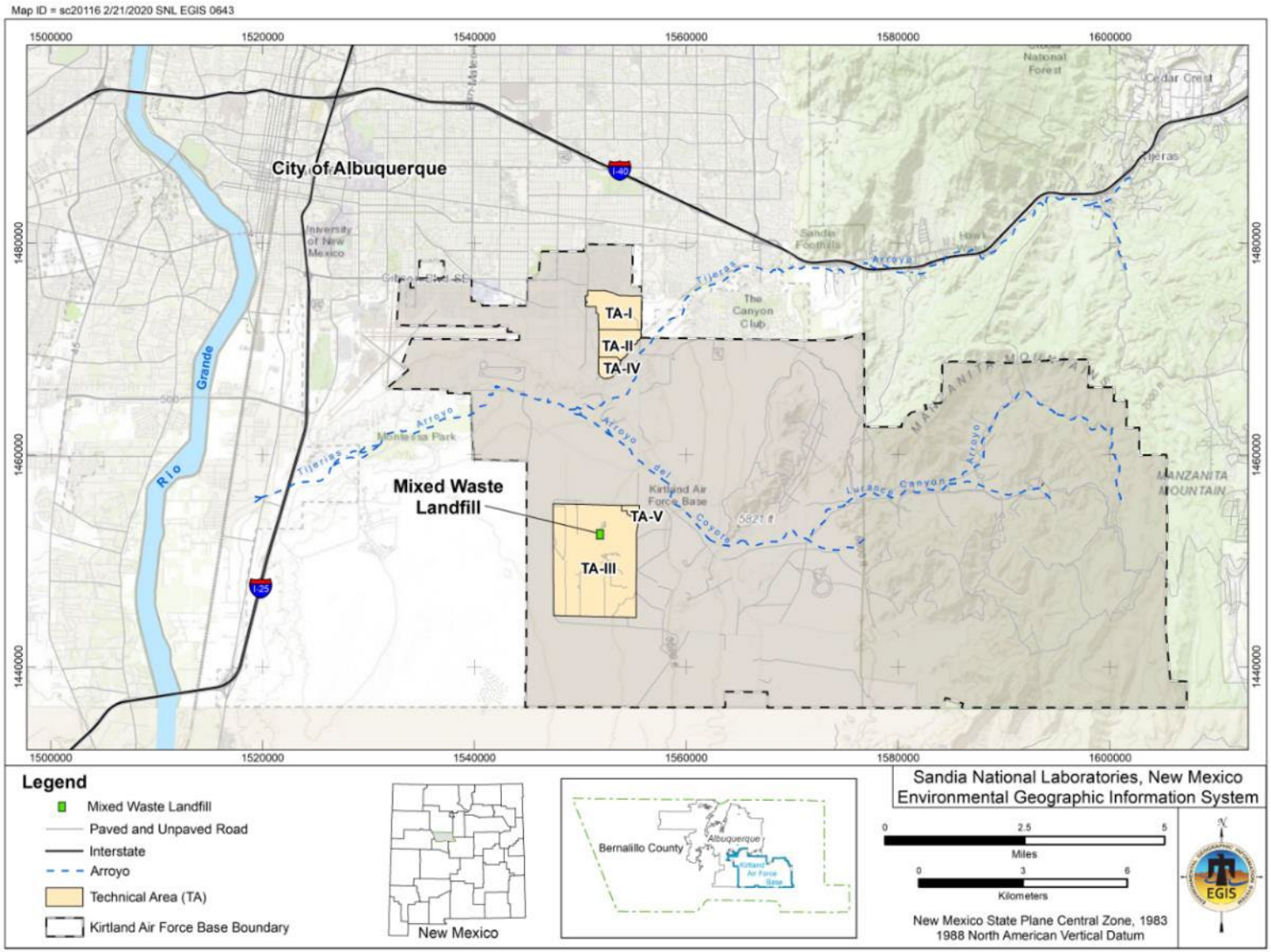


Figure 4-1
Location of the Mixed Waste Landfill with Respect to Kirtland Air Force Base and the City of Albuquerque

All MWL groundwater monitoring activities are performed in accordance with the MWL LTMMP and documented along with the monitoring results in MWL annual long-term monitoring and maintenance reports submitted to the NMED in June of each year. The *Mixed Waste Landfill Annual Long-Term Monitoring and Maintenance Report, April 2023 – March 2024* (SNL/NM, June 2024) was submitted to the NMED in June 2024 and approved (NMED, September 2024). It is the eleventh long-term monitoring and maintenance report submitted to and approved by the NMED.

4.1.1 Monitoring History

MWL groundwater monitoring began in 1990. The original MWL monitoring well network was modified in 2008 due to the declining water table (the water table dropped below the screen intervals) and corrosion of older stainless-steel well screens. Four original monitoring wells (MWL-BW1, MWL-MW1, MWL-MW2, and MWL-MW3) were plugged and abandoned and four new monitoring wells (MWL-BW2, MWL-MW7, MWL-MW8, and MWL-MW9) were installed. These four monitoring wells were constructed with schedule 80 polyvinyl chloride screens set across the water table of the Regional Aquifer and constitute the compliance groundwater monitoring network.

Monitoring well MWL-MW4 was part of the original MWL monitoring well network, was completed at an angle of approximately 6° from vertical, and has two discrete screen intervals (upper and lower) that were isolated by an inflatable packer. On April 14, 2023, the inflatable packer was removed because it failed to maintain the pressure needed to properly seal the area between the screen intervals. Since then, groundwater elevations at MWL-MW4 have reflected the lower screen interval. A RCRA Permit modification requesting approval to decommission MWL-MW4 was submitted to the NMED (DOE, March 2023) and approved (NMED, July 2023). The New Mexico Office of the State Engineer approved the Well Plugging Plan of Operations on November 13, 2024 (NMOSE, November 2024). Decommissioning of MWL-MW4 is planned for CY 2025.

Monitoring wells MWL-MW5 and MWL-MW6 were also part of the original MWL monitoring well network. They are located west of the MWL and their screen intervals are below the top of the Regional Aquifer. They are retained in the MWL LTMMP for informational purposes only (ongoing groundwater elevation measurements).

The groundwater at the MWL has been extensively characterized and monitored for major ion chemistry, volatile organic compounds (VOCs), semivolatile organic compounds, nitrate, metals, radionuclides, and perchlorate. Thirty-three years of analytical data indicate that the groundwater has not been impacted by the MWL.

4.1.2 Monitoring Well Network

The current MWL monitoring well network consists of seven monitoring wells (listed in Table 4-1 and shown on Figure 4-2). In accordance with the MWL LTMMP, four of these monitoring wells (MWL-BW2, MWL-MW7, MWL-MW8, and MWL-MW9) constitute the compliance groundwater monitoring network for the uppermost part of the Regional Aquifer and are sampled semiannually for various analytes. The remaining three monitoring wells (MWL-MW4, MWL-MW5, and MWL-MW6) are retained for groundwater elevation monitoring; sampling of these deeper wells is not required under the MWL LTMMP.

4.1.3 Conceptual Site Model

This section summarizes the Conceptual Site Model (CSM) for the MWL. A detailed CSM is provided in the *Report of the Mixed Waste Landfill Phase 2 RFI* (Peace et al., 2002) and the *Mixed Waste Landfill Groundwater Report, 1990 through 2001* (Goering et al., 2002). An update integrating the findings from the monitoring wells installed in 2008 is presented in the *Mixed Waste Landfill Annual Groundwater Monitoring Report, Calendar Year 2009* (SNL/NM, June 2010).

Table 4-1
Mixed Waste Landfill Monitoring Well Network and Calendar Year 2024 Compliance Activities

Well ID	Installation Year	WQ[a]	WL[a]	Comment[b]
MWL-BW2	2008	✓	✓	Compliance well, sampled semiannually
MWL-MW4[c]	1993		✓	Groundwater elevation only
MWL-MW5	2000		✓	Groundwater elevation only
MWL-MW6	2000		✓	Groundwater elevation only
MWL-MW7	2008	✓	✓	Compliance well, sampled semiannually
MWL-MW8	2008	✓	✓	Compliance well, sampled semiannually
MWL-MW9	2008	✓	✓	Compliance well, sampled semiannually
Total	--	4	7	Total for AGMR reporting

Notes:
[a]Check marks indicate that WQ sampling and WL measurements were completed.
[b]Requirements defined by the MWL LTMMP (SNL/NM, March 2012, as modified). Semiannual groundwater sampling at the compliance monitoring wells was performed in May and October 2024.
[c]The upper screen interval of MWL-MW4 has been historically monitored and is across the uppermost portion of the Regional Aquifer. Since inflatable packer removal on April 14, 2023, groundwater elevations at MWL-MW4 have reflected the lower screen interval.

AGMR = annual groundwater monitoring report
BW = Background Well
ID = identifier
LTMMP = Long-Term Monitoring and Maintenance Plan
MW = Monitoring Well
MWL = Mixed Waste Landfill
SNL = Sandia National Laboratories
WL = water level
WQ = water quality

The upper surface of the Regional Aquifer (water table) at the MWL is contained within the interfingering, unconsolidated, fine-grained alluvial-fan deposits of the Santa Fe Group. The depth to water is approximately 500 ft bgs. The more transmissive, coarser-grained ancestral Rio Grande sediments underlie the fine-grained alluvial-fan deposits beneath the MWL.

The MWL hydrographs (Attachment 4A, Figures 4A-1 and 4A-2) present the groundwater elevations for the MWL monitoring wells. The hydrographs show the rate of groundwater elevation change. On average, the decline rate has been relatively slow, and since 2017, the monitoring wells located west of the MWL have shown stable to slightly increasing or slightly decreasing groundwater elevations. MWL-BW2, which is located east of the MWL, shows the highest decline rate, which has been consistent since 2008 when this monitoring well was installed. From October 2023 to October 2024, the groundwater elevations at the compliance monitoring wells located west of the MWL (MWL-MW7, MWL-MW8, and MWL-MW9) declined, ranging from 0.35 ft at MWL-MW8 to 0.24 ft at MWL-MW9. The groundwater elevation at MWL-BW2 declined 0.32 ft, which was more than the decline of 0.18 ft observed between October 2022 and October 2023. Changes from October 2023 to October 2024 at the other three monitoring wells with different, deeper well completions (MWL-MW4, MWL-MW5, and MWL-MW6) varied. MWL-MW4 showed a slight increase of 0.02 ft and MWL-MW5 and MWL-MW6 showed decreases of 0.30 ft and 0.28 ft, respectively. Recharge from infiltration of direct precipitation at the MWL is negligible due to high evapotranspiration, low precipitation, the thick sequence of unsaturated Santa Fe Group deposits above the water table, and the presence of the ET cover. Groundwater recharge of the Regional Aquifer occurs primarily by the infiltration of precipitation in the Manzanita Mountains located approximately 5 mi to the east and has been affected by extended drought conditions that continued in 2024.

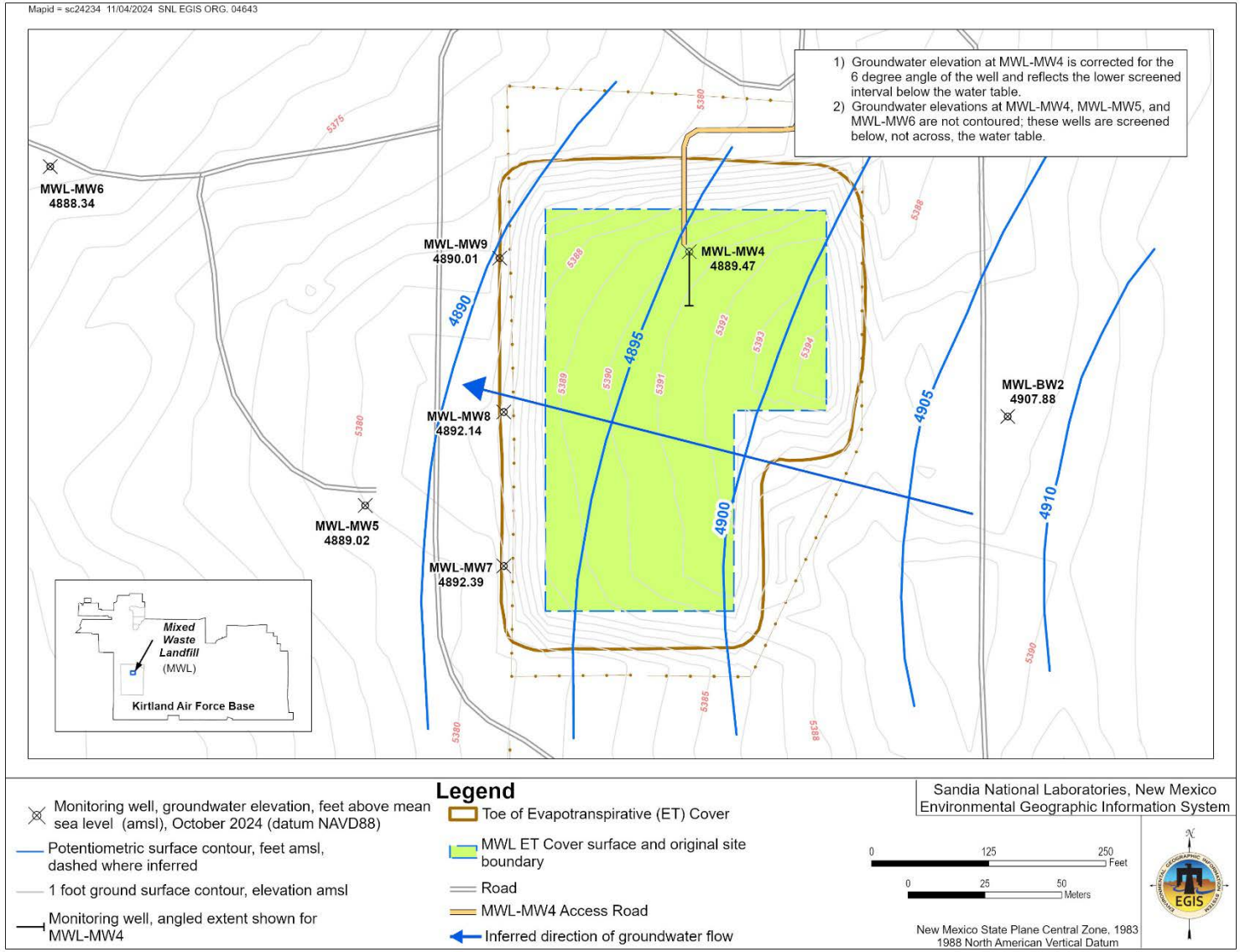


Figure 4-2
Localized Potentiometric Surface of the Regional Aquifer at the Mixed Waste Landfill, October 2024

Table 4-2 presents the groundwater elevation data used to construct the October 2024 potentiometric surface map (Figure 4-2). The October 2024 potentiometric surface of the Regional Aquifer beneath the MWL is consistent with past years.

Table 4-2
Groundwater Elevation Data for Mixed Waste Landfill Monitoring Wells Completed in the Regional Aquifer, October 2024

Well ID	Measurement Point (ft amsl) NAVD 88	Date Measured	Depth to Water (ft btoc)	Groundwater Elevation (ft amsl)
MWL-BW2	5391.02	1-Oct-2024	483.14	4907.88
MWL-MW4[a]	5391.70	1-Oct-2024	505.00	4889.47[b]
MWL-MW5[c]	5382.56	1-Oct-2024	493.54	4889.02
MWL-MW6[c]	5375.31	1-Oct-2024	486.97	4888.34
MWL-MW7	5383.30	1-Oct-2024	490.91	4892.39
MWL-MW8	5384.67	1-Oct-2024	492.53	4892.14
MWL-MW9	5381.91	1-Oct-2024	491.90	4890.01

Notes:
[a]The lower screen interval of MWL-MW4 has been monitored since inflatable packer removal on April 14, 2023; the October 2024 groundwater elevation does not represent the uppermost portion of Regional Aquifer and was not used for contouring.
[b]The groundwater elevation is calculated using a correction for the 6° angle of the well casing.
[c]MWL-MW5 and MWL-MW6 are screened below the water table and are not used for contouring.

° = degree
amsl = above mean sea level
btoc = below top of casing
BW = Background Well
ft = feet
ID = identifier
MW = Monitoring Well
MWL = Mixed Waste Landfill
NAVD 88 = North American Vertical Datum of 1988

The general direction of groundwater flow beneath the MWL is to the west and northwest, toward the Rio Grande and away from the Manzanita Mountains. Figure 4-2 is consistent with the site-wide potentiometric surface map (Plate 1), which shows that the potentiometric surface contours beneath Technical Area-III generally trend north to south, with the inferred groundwater flow direction being generally westward. Several Kirtland Air Force Base (KAFB), Veterans Affairs, and Albuquerque Bernalillo County Water Utility Authority production wells have profoundly modified the natural groundwater flow regime near the MWL by creating a trough in the water table in the western and northern parts of KAFB (Plate 1). As a result, groundwater elevations at the MWL have historically declined, as shown in Attachment 4A, Figures 4A-1 and 4A-2 (from 2000 through 2014). However, since 2014, the decline rate has slowed, and at all monitoring wells located west of the MWL, the groundwater elevations have stabilized, showing slight increases and decreases. The nearest production well, KAFB-4, is located approximately 3 mi north-northwest of the MWL.

Measured orthogonally from the potentiometric surface contours, the horizontal gradient for October 2024 ranged from approximately 0.03 to 0.08 ft/ft. Groundwater velocities in the alluvial-fan sediments were calculated using the current potentiometric surface gradient, the average hydraulic conductivity obtained from slug testing of the four compliance monitoring wells, and an effective porosity of 25%. The calculated CY 2024 groundwater velocity ranged from 0.02 to 0.06 ft/day; the average is 0.04 ft/day. These very low values are consistent with historical values and previous estimates for horizontal groundwater flow at the water table in the vicinity of the MWL.

4.2 Regulatory Requirements

MWL groundwater monitoring is subject to the MWL LTMMP, which took effect on January 8, 2014 and is incorporated through reference into Attachment M of the RCRA Permit. MWL LTMMP Appendix F, Groundwater Sampling and Analysis Plan, details the groundwater monitoring requirements, procedures, and protocols. Per the MWL LTMMP, the regulatory standards for the analytical results are the MWL LTMMP trigger levels (MWL LTMMP Section 5.2.4). However, for the purposes of this Report,

the analytical results are compared to both the trigger levels and the U.S. Environmental Protection Agency maximum contaminant levels (EPA MCLs) (EPA, March 2018), where established. The April 2024-March 2025 MWL annual long-term monitoring and maintenance report will provide a comprehensive evaluation of the analytical results, with comparison of the results to the trigger levels in accordance with the MWL LTMMP.

4.3 Scope of Activities

CY 2024 MWL groundwater monitoring activities included semiannual collection and analysis of groundwater samples from the four MWL compliance monitoring wells (MWL-BW2, MWL-MW7, MWL-MW8, and MWL-MW9) in May and October 2024 in accordance with the MWL LTMMP. The samples were analyzed for VOCs, metals (cadmium, chromium, nickel, and total uranium), specific radionuclides by gamma spectroscopy, gross alpha/beta activity, radon-222, and tritium. Table 4-3 lists the analytes for each monitoring well for each sampling event.

Table 4-3
Analytes for Mixed Waste Landfill Monitoring Wells, Calendar Year 2024

Analytes	Sampling Event	
	May	October
VOCs	MWL-BW2 MWL-MW7 MWL-MW7 (Duplicate) MWL-MW8 MWL-MW9	MWL-BW2 MWL-BW2 (Duplicate) MWL-MW7 MWL-MW8 MWL-MW9
Metals: Cadmium, Chromium, Nickel, and Total Uranium		
Radionuclides: Gamma Spectroscopy (short list[a]) Gross Alpha/Beta Activity Radon-222, and Tritium		

Notes:
[a]Gamma spectroscopy short list for the MWL includes americium-241, cesium-137, and cobalt-60. Potassium-40 is not an MWL constituent of concern but is reported for consistency.
BW = Background Well
MW = Monitoring Well
MWL = Mixed Waste Landfill
VOC = volatile organic compound

4.4 Field Procedures and Measurements

Field water quality parameters and water levels were measured in accordance with the MWL LTMMP and the procedures and methods Chapter 1.0, Section 1.3 describes.

The purging requirements for the MWL (MWL LTMMP Appendix F, Section 3.4) include specifications for pumping at flow rates such that low-yield monitoring wells do not purge dry. These specifications include equipping the portable Bennett groundwater sampling system with small-diameter tubing and a flow meter valve along the discharge line. In addition, during the purging process at monitoring wells prone to purge dry, the flow rate is continually adjusted to achieve as low a flow rate as possible without damaging the pump or causing it to fail due to overheating (the slowest rate possible given equipment limitations).

All monitoring wells met the minimum purge volume requirement during the sampling events; no monitoring wells purged dry.

4.5 Analytical Methods

The analytical laboratory analyzed the groundwater samples using the applicable EPA and DOE-specified methods and protocols identified in Chapter 1.0, Section 1.3.2 (Tables 1-5 and 1-6).

4.6 Summary of Calendar Year 2024 Groundwater Monitoring Results

The following sections summarize the CY 2024 MWL groundwater monitoring results. Attachment 4A (Figures 4A-1 and 4A-2) presents the MWL hydrographs. Attachment 4B (Tables 4B-1 through 4B-5) presents the analytical results and field water quality parameter measurements for both sampling events. The analytical results were reviewed and qualified during data validation and include the laboratory and validation qualifiers. The analytical results and analytical laboratory data packages (Data Package 3) were submitted to the SNL/NM Customer Funded Records Center for retention.

4.6.1 Analytical Results

No analytes were detected at concentrations exceeding the EPA MCLs or MWL LTMMP trigger levels, and the results are consistent with historical results.

4.6.1.1 Volatile Organic Compounds

Table 4B-1 lists the method detection limits for the VOCs; Table 4B-2 presents the VOC results. Acetone was detected in the May 2024 MWL-MW7 environmental sample at an estimated concentration of 2.31 µg/L (J-qualified). This result was qualified during data validation as not detected due to the associated method blank sample result (laboratory contamination). No VOCs were detected in the October 2024 samples.

4.6.1.2 Metals

Table 4B-3 presents the cadmium, chromium, nickel, and total uranium results. Nickel and total uranium were the only metals detected. No metals were detected at concentrations exceeding the EPA MCLs, where established.

4.6.1.3 Radiological Parameters

Table 4B-4 presents the gamma spectroscopy, gross alpha/beta activity, radon-222, and tritium results. The results are below the EPA MCLs, where established.

Gross alpha activity was measured in accordance with 40 CFR Part 141 and used as a radiological screening tool. Naturally occurring uranium was measured independently (total uranium concentration determined by metals analysis described above), and the gross alpha activity measurements were corrected by subtracting the total uranium activity from the uncorrected gross alpha activity results. An SNL/NM health physicist reviewed the results to screen for radiological anomalies and to verify that levels were within acceptable limits. The corrected gross alpha activity results were below the EPA MCL of 15 pCi/L. The gross beta activity results were used as a radiological screening tool and did not indicate the presence of a beta-emitting radionuclide that would exceed the EPA MCL of 4 mrem/yr. Tritium and gamma spectroscopy radionuclide activities were below the minimum detectable activity levels in all samples. There were no indications of radiological contamination in any samples.

4.6.2 Field Water Quality Parameter Measurements

Table 4B-5 presents the field water quality parameter measurements obtained at the end of purging and before sample collection (Chapter 1.0, Section 1.3.1.2) at each monitoring well. The field water quality parameters measured consisted of temperature, specific conductivity, oxidation-reduction potential, potential of hydrogen, turbidity, and dissolved oxygen. These parameters were measured to evaluate water chemistry stability and ensure the collection of representative groundwater samples.

4.7 Quality Control Results

The following sections summarize the CY 2024 field and laboratory QC sample results and their impact on data quality. Chapter 1.0, Section 1.3 describes how the field and laboratory QC samples were collected and prepared. Table 1-7 (Chapter 1.0, Section 1.3.4) lists each field and laboratory QC sample type and purpose.

4.7.1 Field Quality Control Samples

The field QC samples included environmental duplicate, equipment blank, field blank, and trip blank samples.

4.7.1.1 Environmental Duplicate Samples

Environmental duplicate samples were collected from monitoring wells MWL-MW7 (May 2024) and MWL-BW2 (October 2024) and were analyzed for all analytes (Table 4-3). Relative percent differences (RPDs) were calculated for the analytes detected in both the duplicate and original environmental samples. The sample pairs showed good agreement based on RPDs of 3 to 4 for the analytes. These RPDs are within the acceptable range of less than or equal to 20 for VOCs and less than or equal to 35 for metals (MWL LTMMP Appendix F).

4.7.1.2 Equipment Blank Samples

One equipment blank sample associated with monitoring well MWL-MW7 (May 2024) and one equipment blank sample associated with monitoring well MWL-BW2 (October 2024) were collected before sampling of the wells began and were analyzed for all analytes (Table 4-3).

Bromodichloromethane, bromoform, chloroform, and dibromochloromethane were detected in the May 2024 equipment blank sample; however, no corrective action was necessary because these analytes were not detected in the associated environmental sample. No metals or radionuclides were detected in the May 2024 equipment blank sample.

Acetone, bromodichloromethane, chloroform, and potassium-40 were detected in the October 2024 equipment blank sample; however, no corrective action was necessary because these analytes were not detected in the associated environmental sample. No metals or other radionuclides were detected in the October 2024 equipment blank sample.

4.7.1.3 Field Blank Samples

Four field blank samples (one at each monitoring well) were collected in May 2024 and were analyzed for VOCs. Acetone, bromodichloromethane, bromoform, chloroform, and dibromochloromethane were detected in the field blank samples; however, no corrective action was necessary for bromodichloromethane, bromoform, chloroform, or dibromochloromethane because these analytes were not detected in the associated environmental samples. The acetone field blank sample result associated with MWL-MW7 was qualified during data validation as not detected due to the associated method blank

sample result (laboratory contamination) and therefore was not applied to the MWL-MW7 environmental or environmental duplicate sample.

Four field blank samples (one at each monitoring well) were collected in October 2024 and were analyzed for VOCs. Acetone, bromodichloromethane, chloroform, and dibromochloromethane were detected in the field blank samples; however, no corrective action was necessary because these analytes were not detected in the associated environmental samples.

During each sampling event, a field blank sample was collected from the deionized water used for decontamination and equipment blank sample collection and was analyzed for all analytes (Table 4-3). The field blank sample results were used to internally verify the quality of the deionized water but were not used during data validation to qualify environmental or field QC sample results.

4.7.1.4 Trip Blank Samples

Twelve trip blank samples (six in May 2024, six in October 2024) were submitted and analyzed for VOCs. Acetone was detected in the May 2024 trip blank sample associated with monitoring well MWL-MW7. The acetone result was qualified during data validation as not detected due to the associated method blank sample result (laboratory contamination) and therefore was not applied to the MWL-MW7 environmental or environmental duplicate sample. No VOCs were detected in the October 2024 trip blank samples.

4.7.2 Laboratory Quality Control Samples

The laboratory QC samples included laboratory control, method blank, matrix spike and matrix spike duplicate, surrogate spike, and replicate samples. They were analyzed concurrently with the groundwater and field QC samples in accordance with laboratory procedures and EPA methods. Corrective action was implemented in accordance with the applicable data validation procedure and included the qualification of results as Attachment 4B, Tables 4B-2 through 4B-4 detail. In summary, all May 2024 detected results for acetone were qualified during data validation as not detected due to the associated method blank sample result (laboratory contamination). The radon-222 result associated with the May 2024 MWL-BW2 environmental sample was analyzed outside of analytical hold time criteria due to laboratory instrument issues and was qualified during data validation as an estimated value (J-qualified). Additionally, a matrix spike was not analyzed for the radon-222 results associated with the May 2024 MWL-MW7, MWL-MW8, and MWL-MW9 environmental samples; therefore, the radon-222 results were qualified during data validation as estimated detections. There were no laboratory QC sample issues associated with the October 2024 sample results.

4.8 Variances and Nonconformances

All CY 2024 MWL groundwater monitoring activities were performed in accordance with the MWL LTMMP, with no variances or nonconformances identified. All environmental and QC sample results were reviewed and qualified and met the data quality objectives and analytical method and laboratory procedure requirements.

4.9 Summary and Conclusions

Groundwater samples were collected from the four MWL compliance monitoring wells (MWL-BW2, MWL-MW7, MWL-MW8, and MWL-MW9) in May and October 2024 in accordance with the MWL LTMMP. The samples were analyzed for VOCs; metals, including cadmium, chromium, nickel, and total uranium; specific radionuclides by gamma spectroscopy; gross alpha/beta activity; radon-222; and tritium. No analytes were detected at concentrations exceeding the EPA MCLs or MWL LTMMP trigger levels, and the results are consistent with historical results.

4.10 Summary of Future Activities

All MWL monitoring, inspection, and maintenance activities will continue to be performed and documented in accordance with the MWL LTMMP.

In accordance with the MWL LTTMP, MWL groundwater monitoring will continue on a semiannual basis, with the groundwater monitoring results documented in the MWL annual long-term monitoring and maintenance reports submitted to the NMED in June of each year. To eliminate dual reporting not required by the RCRA Permit (MWL LTMMP) or the Consent Order, MWL groundwater monitoring results will not be included in future annual groundwater monitoring reports.

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Attachment 4A
Mixed Waste Landfill Hydrographs

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Attachment 4A Hydrographs

Figure 4A-1 Mixed Waste Landfill Groundwater Monitoring Wells (1 of 2)..... 4A-5
Figure 4A-2 Mixed Waste Landfill Groundwater Monitoring Wells (2 of 2)..... 4A-6

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Figure 4A-1
Mixed Waste Landfill Groundwater Monitoring Wells (1 of 2)

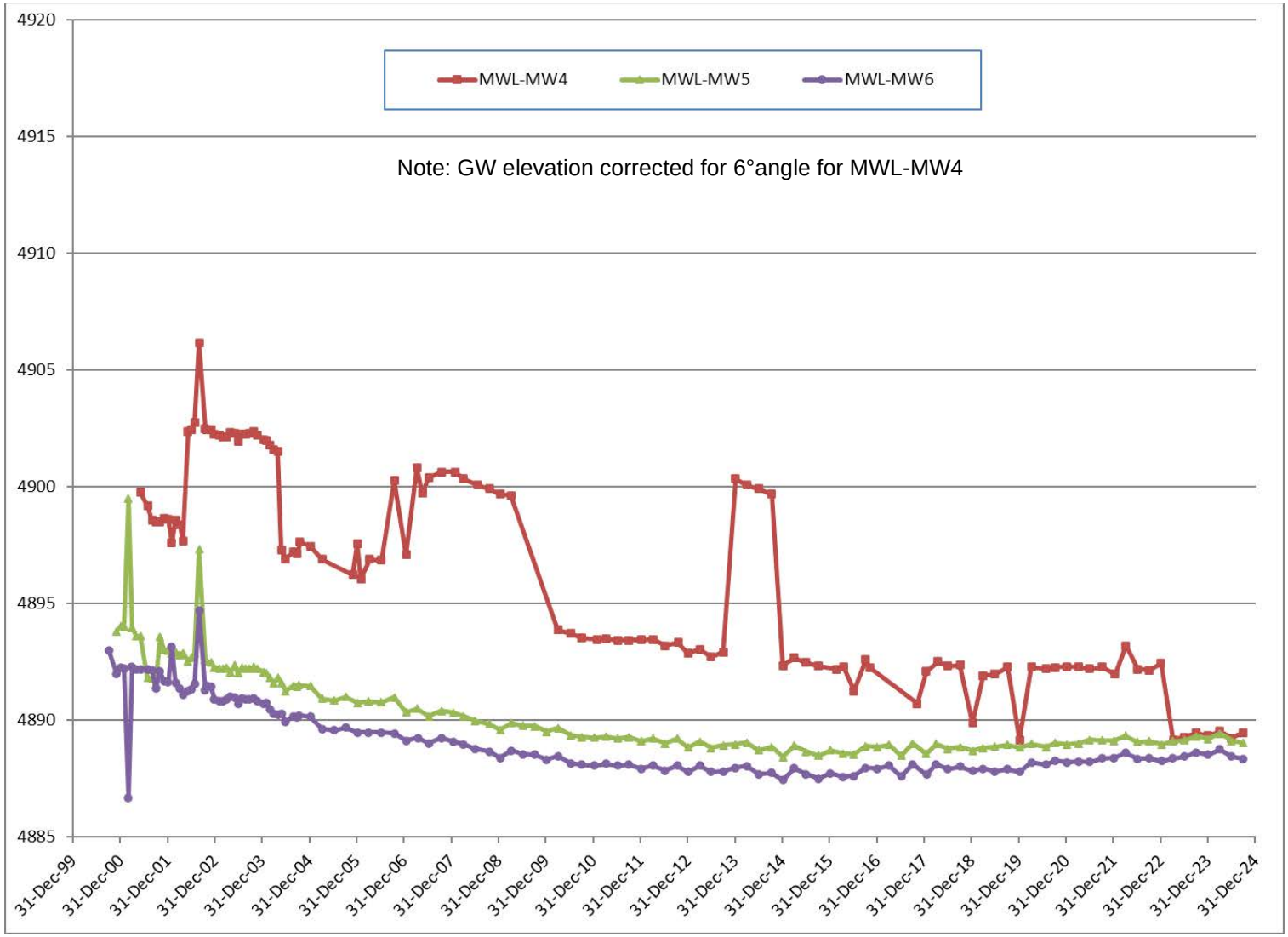


Figure 4A-2
Mixed Waste Landfill Groundwater Monitoring Wells (2 of 2)

Attachment 4B
Mixed Waste Landfill Analytical Results Tables

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Attachment 4B Tables

Table 4B-1 Method Detection Limits for Volatile Organic Compounds, Mixed Waste Landfill Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 4B-5

Table 4B-2 Summary of Detected Volatile Organic Compound Results, Mixed Waste Landfill Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 4B-6

Table 4B-3 Summary of Cadmium, Chromium, Nickel, and Total Uranium Results, Mixed Waste Landfill Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024..... 4B-7

Table 4B-4 Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, Radon, and Tritium Results, Mixed Waste Landfill Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 4B-9

Table 4B-5 Summary of Field Water Quality Parameter Measurements, Mixed Waste Landfill Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 4B-12

Notes for Mixed Waste Landfill Analytical Results Tables 4B-13

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Table 4B-1
Method Detection Limits for Volatile Organic Compounds, Mixed Waste Landfill Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Analyte	MDL[b]
Volatile Organic Compounds (Method SW846-8260D[g]) (µg/L)	
1,1,1-Trichloroethane	0.333
1,1,2,2-Tetrachloroethane	0.333
1,1,2-Trichloroethane	0.333
1,1-Dichloroethane	0.333
1,1-Dichloroethene	0.333
1,2-Dichloroethane	0.333
1,2-Dichloropropane	0.333
2-Butanone	1.67
2-Hexanone	1.67
4-methyl-, 2-Pentanone	1.67
Acetone	1.74
Benzene	0.333
Bromodichloromethane	0.333
Bromoform	0.333
Bromomethane	0.337
Carbon disulfide	1.67
Carbon tetrachloride	0.333
Chlorobenzene	0.333
Chloroethane	0.333
Chloroform	0.333
Chloromethane	0.333
Dibromochloromethane	0.333
Dichlorodifluoromethane	0.355
Ethylbenzene	0.333
Methylene chloride	0.500
Styrene	0.333
Tetrachloroethene	0.333
Toluene	0.333
Trichloroethene	0.333
Vinyl acetate	1.67
Vinyl chloride	0.333
Xylene	1.00
cis-1,2-Dichloroethene	0.333
cis-1,3-Dichloropropene	0.333
trans-1,2-Dichloroethene	0.333
trans-1,3-Dichloropropene	0.333

See notes at end of tables.

Table 4B-2
Summary of Detected Volatile Organic Compound Results, Mixed Waste Landfill Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (µg/L)	MDL[b] (µg/L)	PQL[c] (µg/L)	MCL[d] (µg/L)	Trigger Level[d] (µg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
MWL-MW7 14-May-24	Acetone	2.31	1.74	5.00	NE	3000	B, J	5.00UJ	122554-001	SW846-8260D
No VOCs detected above laboratory method detection limits for October 2024 sampling event										

See notes at end of tables.

Table 4B-3
Summary of Cadmium, Chromium, Nickel, and Total Uranium Results, Mixed Waste Landfill Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL[d] (mg/L)	Trigger Level[d] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
MWL-BW2 13-May-24	Cadmium	ND	0.000300	0.00100	0.005	0.0025	U		122549-002	SW846-6020B
	Chromium	ND	0.00300	0.0100	0.100	0.043	U		122549-002	SW846-6020B
	Nickel	ND	0.000600	0.00200	NE	0.050	U		122549-002	SW846-6020B
	Uranium	0.00648	0.0000670	0.000200	0.030	0.015			122549-002	SW846-6020B
MWL-MW7 14-May-24	Cadmium	ND	0.000300	0.00100	0.005	0.0025	U		122554-002	SW846-6020B
	Chromium	ND	0.00300	0.0100	0.100	0.043	U		122554-002	SW846-6020B
	Nickel	ND	0.000600	0.00200	NE	0.050	U		122554-002	SW846-6020B
	Uranium	0.00711	0.0000670	0.000200	0.030	0.015			122554-002	SW846-6020B
MWL-MW7 (Duplicate) 14-May-24	Cadmium	ND	0.000300	0.00100	0.005	0.0025	U		122555-002	SW846-6020B
	Chromium	ND	0.00300	0.0100	0.100	0.043	U		122555-002	SW846-6020B
	Nickel	ND	0.000600	0.00200	NE	0.050	U		122555-002	SW846-6020B
	Uranium	0.00691	0.0000670	0.000200	0.030	0.015			122555-002	SW846-6020B
MWL-MW8 16-May-24	Cadmium	ND	0.000300	0.00100	0.005	0.0025	U		122563-002	SW846-6020B
	Chromium	ND	0.00300	0.0100	0.100	0.043	U		122563-002	SW846-6020B
	Nickel	ND	0.000600	0.00200	NE	0.050	U		122563-002	SW846-6020B
	Uranium	0.00713	0.0000670	0.000200	0.030	0.015			122563-002	SW846-6020B
MWL-MW9 15-May-24	Cadmium	ND	0.000300	0.00100	0.005	0.0025	U		122560-002	SW846-6020B
	Chromium	ND	0.00300	0.0100	0.100	0.043	U		122560-002	SW846-6020B
	Nickel	ND	0.000600	0.00200	NE	0.050	U		122560-002	SW846-6020B
	Uranium	0.00845	0.0000670	0.000200	0.030	0.015			122560-002	SW846-6020B
MWL-BW2 08-Oct-24	Cadmium	ND	0.000300	0.00100	0.005	0.0025	U		123256-002	SW846-6020B
	Chromium	ND	0.00300	0.0100	0.100	0.043	U		123256-002	SW846-6020B
	Nickel	ND	0.000600	0.00200	NE	0.050	U		123256-002	SW846-6020B
	Uranium	0.00687	0.0000670	0.000200	0.030	0.015			123256-002	SW846-6020B
MWL-BW2 (Duplicate) 08-Oct-24	Cadmium	ND	0.000300	0.00100	0.005	0.0025	U		123257-002	SW846-6020B
	Chromium	ND	0.00300	0.0100	0.100	0.043	U		123257-002	SW846-6020B
	Nickel	ND	0.000600	0.00200	NE	0.050	U		123257-002	SW846-6020B
	Uranium	0.00661	0.0000670	0.000200	0.030	0.015			123257-002	SW846-6020B
MWL-MW7 09-Oct-24	Cadmium	ND	0.000300	0.00100	0.005	0.0025	U		123261-002	SW846-6020B
	Chromium	ND	0.00300	0.0100	0.100	0.043	U	UJ	123261-002	SW846-6020B
	Nickel	ND	0.000600	0.00200	NE	0.050	U	UJ	123261-002	SW846-6020B
	Uranium	0.00770	0.0000670	0.000200	0.030	0.015			123261-002	SW846-6020B

See notes at end of tables.

Table 4B-3 (concluded)
Summary of Cadmium, Chromium, Nickel, and Total Uranium Results, Mixed Waste Landfill Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL[d] (mg/L)	Trigger Level[d] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
MWL-MW8 10-Oct-24	Cadmium	ND	0.000300	0.00100	0.005	0.0025	U		123264-002	SW846-6020B
	Chromium	ND	0.00300	0.0100	0.100	0.043	U		123264-002	SW846-6020B
	Nickel	0.000826	0.000600	0.00200	NE	0.050	J		123264-002	SW846-6020B
	Uranium	0.00804	0.0000670	0.000200	0.030	0.015			123264-002	SW846-6020B
MWL-MW9 14-Oct-24	Cadmium	ND	0.000300	0.00100	0.005	0.0025	U		123267-002	SW846-6020B
	Chromium	ND	0.00300	0.0100	0.100	0.043	U		123267-002	SW846-6020B
	Nickel	ND	0.000600	0.00200	NE	0.050	U		123267-002	SW846-6020B
	Uranium	0.00928	0.0000670	0.000200	0.030	0.015			123267-002	SW846-6020B

See notes at end of tables.

Table 4B-4
Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, Radon, and Tritium Results, Mixed Waste Landfill Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Activity[a] (pCi/L)	MDA[b] (pCi/L)	Critical Level[c] (pCi/L)	MCL[d]	Trigger Level[d]	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
MWL-BW2 13-May-24	Americium-241	2.45 ± 11.9	20.9	10.1	NE	NE	U	BD	122549-003	EPA 901.1
	Cesium-137	0.396 ± 3.94	5.50	2.65	NE	NE	U	BD	122549-003	EPA 901.1
	Cobalt-60	0.563 ± 2.27	4.12	1.90	NE	NE	U	BD	122549-003	EPA 901.1
	Potassium-40	0.201 ± 63.7	38.7	17.8	NE	NE	U	BD	122549-003	EPA 901.1
	Gross Alpha	3.22	NA	NA	15 pCi/L	15 pCi/L	NA	None	122549-004	EPA 900.0
	Gross Beta	7.46 ± 0.925	1.10	0.530	4 mrem/yr	4 mrem/yr			122549-004	EPA 900.0
	Tritium	22.2 ± 85.2	157	68.6	4 mrem/yr	4 mrem/yr	U	BD	122549-005	EPA 906.0M
	Radon-222	373 ± 134	165	80.4	NE	1000 pCi/L	H	J-	122549-006	SM7500 Rn B
MWL-MW7 14-May-24	Americium-241	1.94 ± 6.70	11.8	5.73	NE	NE	U	BD	122554-003	EPA 901.1
	Cesium-137	0.468 ± 1.52	2.69	1.28	NE	NE	U	BD	122554-003	EPA 901.1
	Cobalt-60	1.35 ± 1.53	2.77	1.29	NE	NE	U	BD	122554-003	EPA 901.1
	Potassium-40	-15.1 ± 33.4	40.8	19.4	NE	NE	U	BD	122554-003	EPA 901.1
	Gross Alpha	2.09	NA	NA	15 pCi/L	15 pCi/L	NA	None	122554-004	EPA 900.0
	Gross Beta	6.24 ± 0.988	1.33	0.640	4 mrem/yr	4 mrem/yr			122554-004	EPA 900.0
	Tritium	54.5 ± 96.5	164	77.8	4 mrem/yr	4 mrem/yr	U	BD	122554-005	EPA 906.0M
	Radon-222	108 ± 87.9	141	68.2	NE	1000 pCi/L	U	BD	122554-006	SM7500 Rn B
MWL-MW7 (Duplicate) 14-May-24	Americium-241	2.13 ± 4.94	7.88	3.83	NE	NE	U	BD	122555-003	EPA 901.1
	Cesium-137	1.47 ± 1.46	2.40	1.14	NE	NE	U	BD	122555-003	EPA 901.1
	Cobalt-60	-3.13 ± 3.07	2.78	1.30	NE	NE	U	BD	122555-003	EPA 901.1
	Potassium-40	-19.8 ± 34.6	35.3	16.8	NE	NE	U	BD	122555-003	EPA 901.1
	Gross Alpha	-1.65	NA	NA	15 pCi/L	15 pCi/L	NA	None	122555-004	EPA 900.0
	Gross Beta	6.93 ± 0.983	1.28	0.615	4 mrem/yr	4 mrem/yr			122555-004	EPA 900.0
	Tritium	69.0 ± 97.7	164	77.8	4 mrem/yr	4 mrem/yr	U	BD	122555-005	EPA 906.0M
	Radon-222	162 ± 93.4	141	68.4	NE	1000 pCi/L		J	122555-006	SM7500 Rn B
MWL-MW8 16-May-24	Americium-241	2.19 ± 7.24	12.8	6.23	NE	NE	U	BD	122563-003	EPA 901.1
	Cesium-137	0.0254 ± 1.26	2.21	1.05	NE	NE	U	BD	122563-003	EPA 901.1
	Cobalt-60	0.318 ± 1.31	2.44	1.13	NE	NE	U	BD	122563-003	EPA 901.1
	Potassium-40	14.8 ± 40.6	25.6	11.9	NE	NE	U	BD	122563-003	EPA 901.1
	Gross Alpha	3.29	NA	NA	15 pCi/L	15 pCi/L	NA	None	122563-004	EPA 900.0
	Gross Beta	5.92 ± 1.07	1.51	0.730	4 mrem/yr	4 mrem/yr			122563-004	EPA 900.0
	Tritium	34.3 ± 91.9	158	75.4	4 mrem/yr	4 mrem/yr	U	BD	122563-005	EPA 906.0M
	Radon-222	140 ± 71.5	104	50.7	NE	1000 pCi/L		J	122563-006	SM7500 Rn B

See notes at end of tables.

Table 4B-4 (continued)
Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, Radon, and Tritium Results, Mixed Waste Landfill Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Activity[a] (pCi/L)	MDA[b] (pCi/L)	Critical Level[c] (pCi/L)	MCL[d]	Trigger Level[d]	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
MWL-MW9 15-May-24	Americium-241	0.569 ± 5.76	9.28	4.51	NE	NE	U	BD	122560-003	EPA 901.1
	Cesium-137	-0.644 ± 1.27	2.09	0.989	NE	NE	U	BD	122560-003	EPA 901.1
	Cobalt-60	-0.479 ± 1.31	2.28	1.06	NE	NE	U	BD	122560-003	EPA 901.1
	Potassium-40	9.12 ± 34.7	24.9	11.6	NE	NE	U	BD	122560-003	EPA 901.1
	Gross Alpha	4.94	NA	NA	15 pCi/L	15 pCi/L	NA	None	122560-004	EPA 900.0
	Gross Beta	6.64 ± 1.03	1.39	0.672	4 mrem/yr	4 mrem/yr			122560-004	EPA 900.0
	Tritium	27.7 ± 88.0	153	72.4	4 mrem/yr	4 mrem/yr	U	BD	122560-005	EPA 906.0M
	Radon-222	447 ± 127	116	56.5	NE	1000 pCi/L		J	122560-006	SM7500 Rn B
MWL-BW2 08-Oct-24	Americium-241	0.698 ± 27.7	22.2	10.6	NE	NE	U	BD	123256-003	EPA 901.1
	Cesium-137	-0.710 ± 1.70	2.87	1.34	NE	NE	U	BD	123256-003	EPA 901.1
	Cobalt-60	1.63 ± 1.73	3.27	1.49	NE	NE	U	BD	123256-003	EPA 901.1
	Potassium-40	-40.3 ± 38.1	42.9	20.0	NE	NE	U	BD	123256-003	EPA 901.1
	Gross Alpha	3.60	NA	NA	15 pCi/L	15 pCi/L	NA	None	123256-004	EPA 900.0
	Gross Beta	7.03 ± 1.04	1.38	0.670	4 mrem/yr	4 mrem/yr			123256-004	EPA 900.0
	Tritium	26.0 ± 95.8	166	79.2	4 mrem/yr	4 mrem/yr	U	BD	123256-005	EPA 906.0M
	Radon-222	385 ± 119	126	61.0	NE	1000 pCi/L			123256-006	SM7500 Rn B
MWL-BW2 (Duplicate) 08-Oct-24	Americium-241	-4.81 ± 5.75	6.17	2.96	NE	NE	U	BD	123257-003	EPA 901.1
	Cesium-137	0.134 ± 1.50	2.69	1.26	NE	NE	U	BD	123257-003	EPA 901.1
	Cobalt-60	0.686 ± 1.60	3.06	1.40	NE	NE	U	BD	123257-003	EPA 901.1
	Potassium-40	17.9 ± 37.9	23.0	10.2	NE	NE	U	BD	123257-003	EPA 901.1
	Gross Alpha	4.13	NA	NA	15 pCi/L	15 pCi/L	NA	None	123257-004	EPA 900.0
	Gross Beta	6.31 ± 0.929	1.20	0.579	4 mrem/yr	4 mrem/yr			123257-004	EPA 900.0
	Tritium	127 ± 131	215	103	4 mrem/yr	4 mrem/yr	U	BD	123257-005	EPA 906.0M
	Radon-222	337 ± 111	126	61.1	NE	1000 pCi/L		J	123257-006	SM7500 Rn B
MWL-MW7 09-Oct-24	Americium-241	0.727 ± 3.56	5.75	2.77	NE	NE	U	BD	123261-003	EPA 901.1
	Cesium-137	-0.743 ± 4.38	5.89	2.76	NE	NE	U	BD	123261-003	EPA 901.1
	Cobalt-60	1.43 ± 3.05	5.97	2.69	NE	NE	U	BD	123261-003	EPA 901.1
	Potassium-40	8.88 ± 64.2	60.4	27.2	NE	NE	U	BD	123261-003	EPA 901.1
	Gross Alpha	2.28	NA	NA	15 pCi/L	15 pCi/L	NA	None	123261-004	EPA 900.0
	Gross Beta	5.90 ± 0.874	1.10	0.530	4 mrem/yr	4 mrem/yr			123261-004	EPA 900.0
	Tritium	84.7 ± 100	166	79.4	4 mrem/yr	4 mrem/yr	U	BD	123261-005	EPA 906.0M
	Radon-222	217 ± 80.2	100	48.5	NE	1000 pCi/L		J	123261-006	SM7500 Rn B

See notes at end of tables.

Table 4B-4 (concluded)
Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, Radon, and Tritium Results, Mixed Waste Landfill Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Activity[a] (pCi/L)	MDA[b] (pCi/L)	Critical Level[c] (pCi/L)	MCL[d]	Trigger Level[d]	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
MWL-MW8	Americium-241	2.12 ± 16.4	29.1	14.0	NE	NE	U	BD	123264-003	EPA 901.1
10-Oct-24	Cesium-137	-0.683 ± 1.93	3.29	1.53	NE	NE	U	BD	123264-003	EPA 901.1
	Cobalt-60	-0.0893 ± 2.36	2.36	1.99	NE	NE	U	BD	123264-003	EPA 901.1
	Potassium-40	19.9 ± 50.0	34.2	15.3	NE	NE	U	BD	123264-003	EPA 901.1
	Gross Alpha	3.15	NA	NA	15 pCi/L	15 pCi/L	NA	None	123264-004	EPA 900.0
	Gross Beta	5.74 ± 0.907	1.24	0.600	4 mrem/yr	4 mrem/yr			123264-004	EPA 900.0
	Tritium	107 ± 101	164	78.4	4 mrem/yr	4 mrem/yr	U	BD	123264-005	EPA 906.0M
	Radon-222	136 ± 63.9	87.8	41.8	NE	1000 pCi/L		J	123264-006	SM7500 Rn B
MWL-MW9	Americium-241	-0.133 ± 12.8	21.1	10.2	NE	NE	U	BD	123267-003	EPA 901.1
14-Oct-24	Cesium-137	0.394 ± 4.81	3.88	1.82	NE	NE	U	BD	123267-003	EPA 901.1
	Cobalt-60	-0.388 ± 2.96	4.56	2.09	NE	NE	U	BD	123267-003	EPA 901.1
	Potassium-40	-5.17 ± 54.8	73.1	34.7	NE	NE	U	BD	123267-003	EPA 901.1
	Gross Alpha	-1.51	NA	NA	15 pCi/L	15 pCi/L	NA	None	123267-004	EPA 900.0
	Gross Beta	6.77 ± 1.21	1.74	0.847	4 mrem/yr	4 mrem/yr	*		123267-004	EPA 900.0
	Tritium	56.4 ± 113	193	92.6	4 mrem/yr	4 mrem/yr	U	BD	123267-005	EPA 906.0M
	Radon-222	464 ± 116	60.8	28.8	NE	1000 pCi/L			123267-006	SM7500 Rn B

See notes at end of tables.

Table 4B-5
Summary of Field Water Quality Parameter Measurements, Mixed Waste Landfill Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Sample Date	Temperature[h] (^{0}C)	Specific Conductivity[h] (µmho/cm)	Oxidation Reduction Potential[h] (mV)	pH[h]	Turbidity[h] (NTU)	Dissolved Oxygen[h] (% Sat)	Dissolved Oxygen[h] (mg/L)
MWL-BW2	13-May-24	21.28	730.62	110.0	7.40	1.00	36.56	2.65
MWL-MW7	14-May-24	22.43	614.07	113.0	7.58	0.34	89.97	6.34
MWL-MW8	16-May-24	12.05	623.02	169.1	7.52	0.37	30.16	7.67
MWL-MW9	15-May-24	23.61	622.95	128.5	7.48	0.03	21.69	1.50
MWL-BW2	08-Oct-24	22.27	773.19	83.0	7.39	0.93	45.25	3.24
MWL-MW7	09-Oct-24	23.10	653.70	121.2	7.59	0.18	89.88	6.32
MWL-MW8	10-Oct-24	22.94	678.96	111.5	7.48	0.37	36.24	2.56
MWL-MW9	14-Oct-24	23.86	656.47	82.4	7.48	0.19	18.26	1.27

See notes at end of tables.

Notes for Mixed Waste Landfill Analytical Results Tables

%	= percent
BW	= Background Well
CFR	= Code of Federal Regulations
EPA	= U.S. Environmental Protection Agency
ID	= identifier
µg/L	= micrograms per liter
mg/L	= milligrams per liter
mrem/yr	= millirem per year
MW	= Monitoring Well
MWL	= Mixed Waste Landfill
No.	= number
pCi/L	= picocuries per liter

[a]Result or Activity

Result applies to Tables 4B-2 and 4B-3; activity applies to Table 4B-4.

Gross alpha activity measurements were corrected by subtracting the total uranium activity (40 CFR 141). Activities of zero or less are considered not detected.

Bold	= Value exceeds the established EPA MCL.
ND	= not detected (at MDL)

[b]MDL or MDA

The MDL applies to Table 4B-1 through 4B-3. MDA applies to Table 4B-4.

MDA	= The minimal detectable activity or minimum measured activity in a sample required to ensure a 95% probability that the measured activity is accurately quantified above the critical level.
MDL	= Method detection limit. The minimum concentration or activity that can be measured and reported with 99% confidence that the analyte is greater than zero, analyte is matrix specific.
NA	= Not applicable for gross alpha activities. The MDA could not be calculated as the gross alpha activity was corrected by subtracting out the total uranium activity.

[c]PQL or Critical Level

The PQL applies to Table 4B-2 and 4B-3. Critical level applies to Table 4B-4.

Critical Level	= The minimum activity that can be measured and reported with 99% confidence that the analyte is greater than zero, analyte is matrix specific.
PQL	= Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.
NA	= Not applicable for gross alpha activities. The critical level could not be calculated as the gross alpha activity was corrected by subtracting out the total uranium activity.

[d]MCL and Trigger Level

MCL = Maximum contaminant level. Established by the EPA Office of Water, National Primary Drinking Water Standards, (EPA March 2018).

The following are the MCLs for gross alpha particles and beta particles in community water systems:

- 15 pCi/L = gross alpha particle activity, excluding total uranium (40 CFR Part 141)
- 4 mrem/yr = any combination of beta and/or gamma emitting radionuclides (as dose rate)

NE	= not established
Trigger Level	= Groundwater trigger levels are provided in MWL Long-Term Monitoring and Maintenance Plan Section 5.2.4.

Notes for Mixed Waste Landfill Analytical Results Tables (concluded)

[e]Laboratory Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

*	= Recovery or %RPD not within acceptance limits and/or spike amount not compatible with the sample or the duplicate RPD's are not applicable where the concentration falls below the effective PQL.
B	= The analyte was found in the blank above the effective MDL.
H	= Analytical holding time was exceeded.
J	= Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL.
NA	= not applicable
U	= Analyte is absent or below the MDL.

[f]Validation Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

BD	= Below detection limit as used in radiochemistry to identify results that are not statistically different from zero.
J	= The associated value is an estimated quantity.
J-	= The associated numerical value is an estimated quantity with a suspected negative bias.
None	= No data validation for corrected gross alpha activity.
UJ	= The analyte was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

[g]Analytical Method

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SM	= Standard Method
SW	= Solid Waste

[h]Field Water Quality Parameter Measurements

Field measurements obtained prior to sampling.

°C	= degrees Celsius
% Sat	= percent saturation
µmho/cm	= micromhos per centimeter
mg/L	= milligrams per liter
mV	= millivolts
NTU	= nephelometric turbidity units
pH	= potential of hydrogen (negative logarithm of the hydrogen ion concentration)

Chapter 4.0
Mixed Waste Landfill References

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5.0 Technical Area-V Groundwater Area of Concern

5.1 Introduction

This chapter summarizes the calendar year (CY) 2024 Technical Area-V Groundwater (TAVG) Area of Concern (AOC) groundwater monitoring activities and results.

Trichloroethene (TCE) and nitrate have been identified as constituents of concern (COCs) in the groundwater in the TAVG AOC based on detections above the U.S. Environmental Protection Agency maximum contaminant levels (EPA MCLs). Low concentrations of TCE and nitrate have consistently been detected in the Regional Aquifer that is present approximately 500 ft bgs. The EPA MCLs and New Mexico Water Quality Control Commission maximum allowable concentrations (MACs) for TCE and nitrate are 5 μg/L and 10 mg/L, respectively (EPA, March 2018; NMWQCC, December 2018). Since 1992, the maximum concentrations detected in the groundwater have been 22.4 μg/L for TCE and 15.3 mg/L for nitrate.

Because the EPA MCLs and MACs for TCE and nitrate are the same, the term EPA MCL is used in this chapter and its attachments for both regulatory standards.

5.1.1 Location

Technical Area (TA)-V is located in the west-central part of Kirtland Air Force Base (KAFB), south of the City of Albuquerque (Figure 5-1 and Plate 1). It occupies approximately 35 acres in the northeast corner of TA-III at Sandia National Laboratories, New Mexico (SNL/NM).

5.1.2 Site History

TA-V was established in 1961 to test radiation effects on weapon components and has hosted multiple generations of research reactors, including the Sandia Engineering Reactor Facility, the Sandia Pulsed Reactor, the High Energy Radiation Megavolt Electron Source, and the PROTO I Facility. Active nuclear facilities include the Annular Core Research Reactor, the Sandia Pulsed Reactor, and the Auxiliary Hot Cell Facility, as well as radiological facilities such as the Gamma Irradiation Facility and the Low Dose Rate Irradiation Facility.

Since 1992, U.S. Department of Energy National Nuclear Security Administration (DOE/NNSA) and SNL/NM personnel have conducted numerous surface and subsurface investigations and remedial activities in TA-V. Attachment 5A (Table 5A-1) provides the historical timeline of the investigations and the corresponding reference documents through December 2024. Past investigations were mainly site specific and conducted at various Solid Waste Management Unit (SWMUs) and AOCs. A total of 21 SWMUs and AOCs were previously identified in TA-V. The New Mexico Environment Department (NMED) has granted Corrective Action Complete status to all 21 SWMUs and AOCs (SNL/NM, September 2015). The groundwater in TA-V is addressed separately as the TAVG AOC.

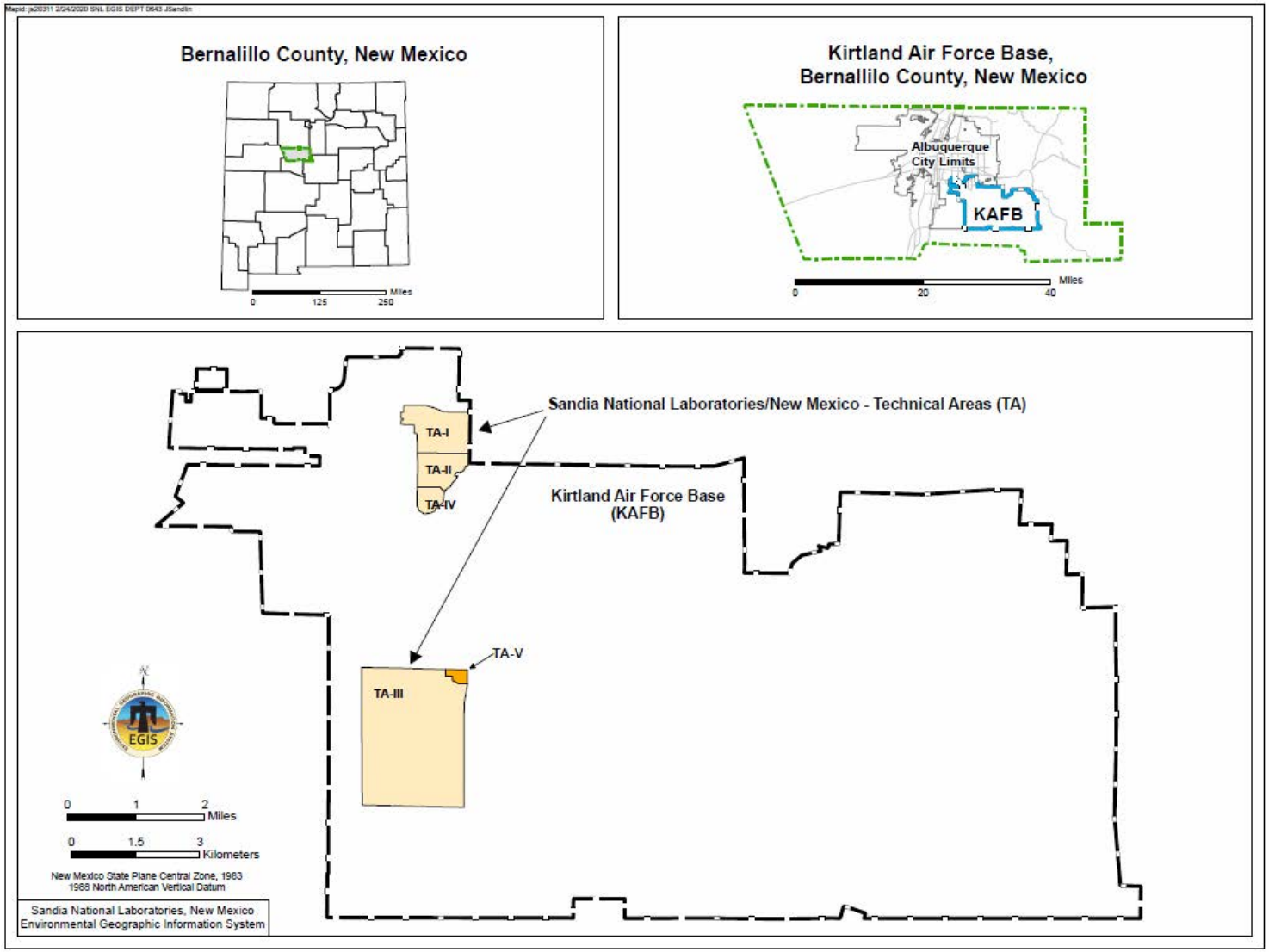


Figure 5-1
Location of Sandia National Laboratories, New Mexico and Technical Area-V

5.1.3 Monitoring History

TA-V groundwater monitoring began in October 1992. Historically, wastewater derived from TA-V facilities was disposed of at the Liquid Waste Disposal System (LWDS) Drain Field, the two unlined LWDS Surface Impoundments, and the TA-V Seepage Pits. TCE above the EPA MCL of 5 µg/L was first detected at monitoring well LWDS-MW1 in November 1993 at a concentration of 6 µg/L. Nitrate above the EPA MCL of 10 mg/L was first detected at LWDS-MW1 in December 1995 at a concentration of 10.1 mg/L. Since 1992, 21 monitoring wells have been installed and 4 of the 21 wells have been plugged and abandoned (Table 5-1).

Three soil-vapor wells were installed in the TAVG AOC in 2011. Soil-vapor samples were collected for eight consecutive quarters from April 2011 through March 2013. The samples were analyzed for volatile organic compounds (VOCs), including TCE. The analytical results were reported in Attachment 5D of the *Annual Groundwater Monitoring Report, Calendar Year 2013* (CY 2013 AGMR) (SNL/NM, June 2014) and are summarized in Section 5.1.6.5.

DOE/NNSA and SNL/NM personnel installed injection well TAV-INJ1 in 2017 for a treatability study to evaluate the effectiveness of in-situ bioremediation (ISB) in treating the groundwater contamination in the TAVG AOC. Following the treatability study, the NMED approved TAV-INJ1 for decommissioning (NMED, September 2022).

5.1.4 Current Monitoring Well Network

Table 5-1 lists the monitoring and injection wells installed to date; Figure 5-2 shows the well locations. Currently, there are 17 active monitoring wells (LWDS-MW1 and TAV-MW2 through TAV-MW17) in the TAVG AOC. These monitoring wells constitute the current TAVG AOC monitoring well network.

Table XI-1 of the *Compliance Order on Consent Pursuant to the New Mexico Hazardous Waste Act 74-4-10: Sandia National Laboratories Consent Order* (Consent Order) (NMED, April 2004) specifies a quarterly groundwater sampling frequency for the TAVG AOC. Following the ISB treatability study, DOE/NNSA and SNL/NM personnel requested approval to modify the sampling plan, eliminating the quarterly sampling requirement for the TAVG AOC monitoring well network (DOE, August 2022). The NMED approved the request (NMED, December 2022). DOE/NNSA and SNL/NM personnel started to implement the modified sampling plan in CY 2023. Section 5.3 describes the current sampling plan.

Table 5-1
Groundwater Monitoring and Injection Wells Screened in the Regional Aquifer in the Technical Area-V Groundwater Area of Concern

Well ID	Installation Year	WQ[a]	WL[a]	Comments
AVN-1	1995	NA	NA	Deeper completion (570–590 ft bgs), P&A in February 2023
AVN-2	1995	NA	NA	Water table completion (492–515 ft bgs), P&A in February 2023
LWDS-MW1	1993	✓	✓	Water table completion (495–515 ft bgs)
LWDS-MW2	1992	NA	NA	Deeper completion (506–526 ft bgs), P&A in February 2023
TAV-INJ1[b]	2017	NA	NA	Water table completion (509–539 ft bgs)
TAV-MW1	1995	NA	NA	Water table completion (489.5–509.5 ft bgs), P&A in February 2008
TAV-MW2	1995	✓	✓	Water table completion (497–513.5 ft bgs)
TAV-MW3	1997	✓	✓	Water table completion (532–552 ft bgs)
TAV-MW4	1997	✓	✓	Water table completion (495–515 ft bgs)
TAV-MW5	1997	✓	✓	Water table completion (487–507 ft bgs)
TAV-MW6	2001	✓	✓	Water table completion (507–527 ft bgs)
TAV-MW7	2001	✓	✓	Deeper completion (597–617 ft bgs)
TAV-MW8	2001	✓	✓	Water table completion (491–511 ft bgs)
TAV-MW9	2001	✓	✓	Deeper completion (582–602 ft bgs)
TAV-MW10	2008	✓	✓	Water table completion (508–528 ft bgs), replaced TAV-MW1
TAV-MW11	2010	✓	✓	Water table completion (512–532 ft bgs)
TAV-MW12	2010	✓	✓	Water table completion (507–527 ft bgs)
TAV-MW13	2010	✓	✓	Deeper completion (525–545 ft bgs)
TAV-MW14	2010	✓	✓	Water table completion (512–532 ft bgs)
TAV-MW15	2017	✓	✓	Water table completion (516–541ft bgs)
TAV-MW16	2017	✓	✓	Water table completion (527–552 ft bgs)
TAV-MW17	2023	✓	✓	Water table completion (523–543 ft bgs)
Total	----	17	17	Total for AGMR reporting

Notes:
[a] Check marks (✓) indicate WQ sampling and WL measurements were conducted in CY 2024.
[b] Approved for decommissioning as of September 2022 (NMED, September 2022).

AGMR = annual groundwater monitoring report
AVN = Area-V North
bgs = below ground surface
CY = calendar year
ft = foot (feet)
ID = identifier
INJ = Injection Well
LWDS = Liquid Waste Disposal System
MW = Monitoring Well
NA = not applicable
P&A = plugged and abandoned (decommissioned)
TAV = Technical Area-V (acronym used for well identification only)
WL = water level
WQ = water quality

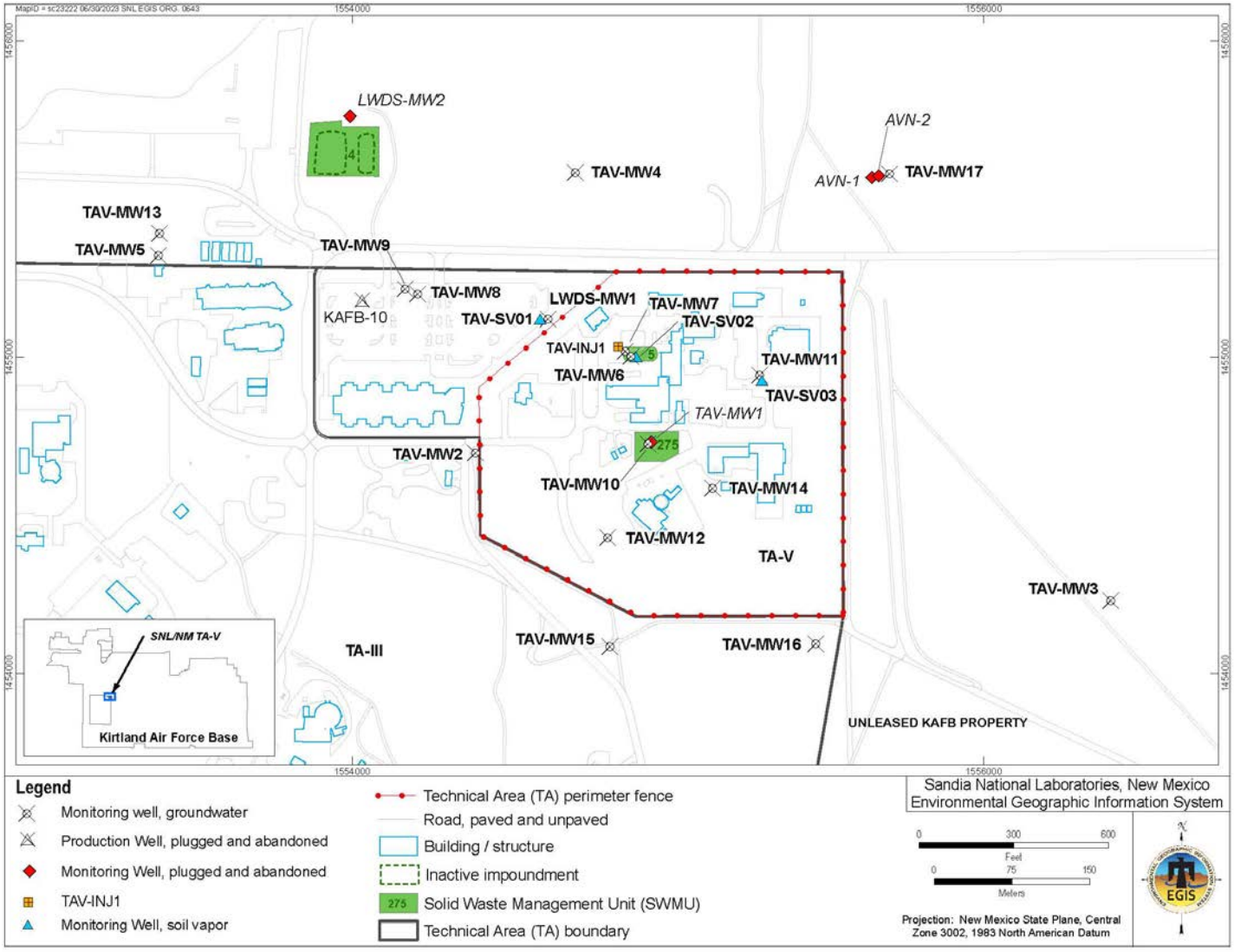


Figure 5-2
Technical Area-V Groundwater Area of Concern Monitoring Well Locations

5.1.5 Conceptual Site Model

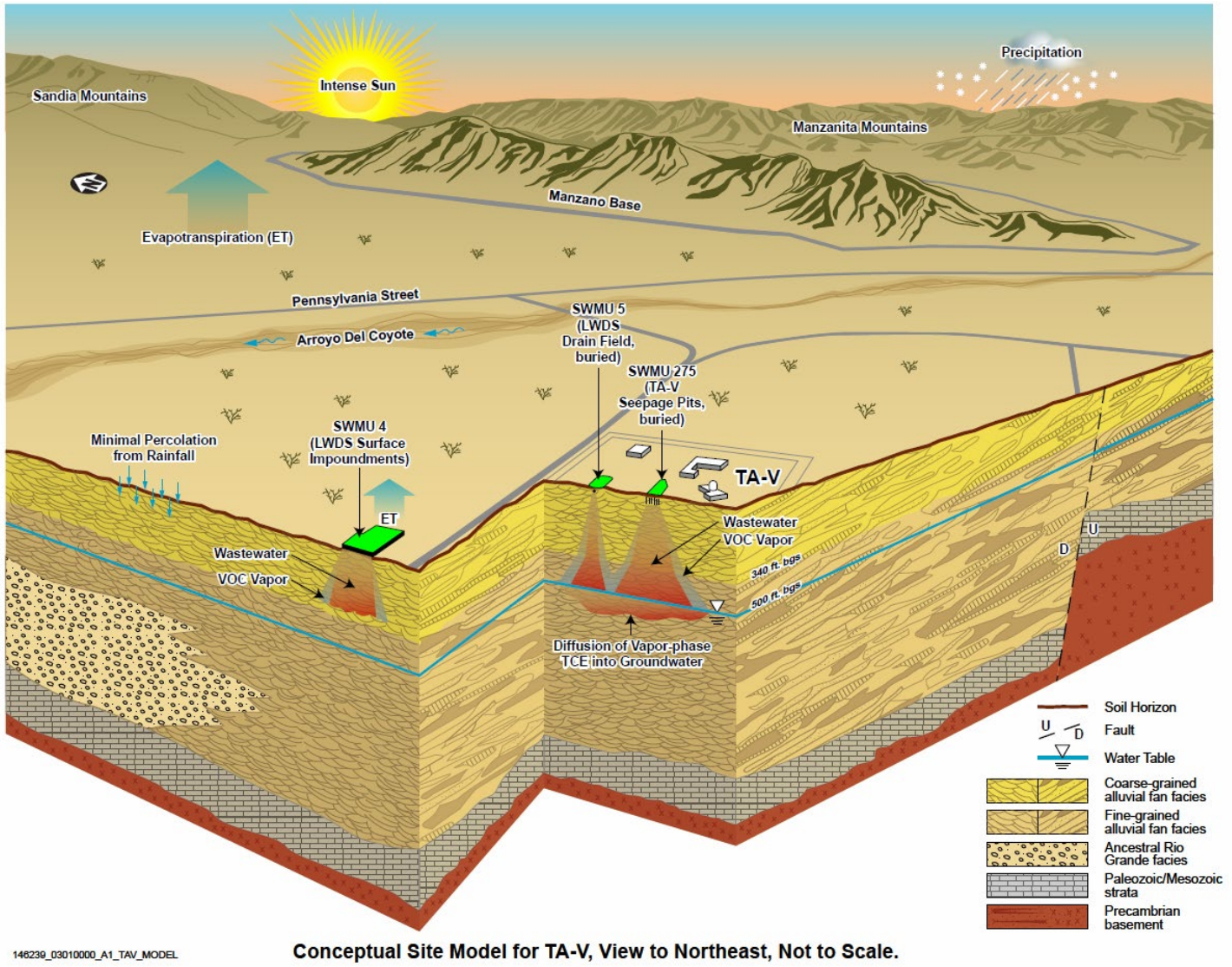
The following sections summarize the Conceptual Site Model (CSM) for the TAVG AOC. The CSM was updated in the *Current Conceptual Model for Technical Area-V Groundwater Area of Concern at Sandia National Laboratories, New Mexico* (2015 CCM) (SNL/NM, September 2015) and remains valid for the *Technical Area-V Groundwater Area of Concern Current Conceptual Model and Corrective Measures Evaluation Report* (2024 CCM/CME Report) (SNL/NM, May 2024). The schematic depiction of the CSM (Figure 5-3) shows the geological and hydrogeological framework, contaminant sources, and distribution and migration paths of contaminants in the subsurface of TA-V.

5.1.5.1 Regional Hydrogeologic Conditions

TA-V is located within the Albuquerque Basin of the Rio Grande Rift in north-central New Mexico. The Rio Grande Rift is marked by a series of sediment-filled structural basins and adjoining uplifted mountain ranges. One of these basins, the Albuquerque Basin (also known as the Middle Rio Grande Basin), covers approximately 3,060 mi^2 in central New Mexico and extends north-south from Cochiti Reservoir to San Acacia, New Mexico. The Albuquerque Basin includes TA-V and the western part of KAFB.

The sedimentary deposits of the Santa Fe Group (SFG) and overlying alluvium that fill the Albuquerque Basin contain the Regional Aquifer. The Regional Aquifer is the primary source of municipal and industrial water in the Albuquerque area. The structure of the Regional Aquifer within the Middle Rio Grande Basin is complex (Bartolino and Cole, 2002). The major hydrostratigraphic units in the aquifer are tabular and wedge-shaped bodies that are truncated and displaced by numerous faults. Few of the major units are present continuously throughout the basin, and most pinch out against the subsurface basement blocks. These major units are hundreds to thousands of feet thick, extend over tens of square miles, and primarily consist of unconsolidated and partially cemented deposits that interfinger in complex arrangements.

The Regional Aquifer exhibits unconfined conditions. Before the development of groundwater resources in the Albuquerque area, groundwater flow in the Albuquerque Basin was generally north to south, with a westward component of groundwater flow from recharge areas along mountain-front boundaries to the east (Bartolino and Cole, 2002). As the Regional Aquifer was developed as a source of municipal and industrial water, groundwater flow directions were altered toward the production wells near the northern boundary of KAFB. A minor amount of discharge occurs as groundwater moves out of the Albuquerque Basin into downgradient basins along the Rio Grande Rift as underflow or through discharge to the Rio Grande.



Conceptual Site Model for TA-V, View to Northeast, Not to Scale.

Figure 5-3
Conceptual Site Model for the Technical Area-V Groundwater Area of Concern (SNL/NM, September 2015)

5.1.5.2 Hydrologic Conditions in Technical Area-V

TA-V is primarily underlain by a thick section of alluvial fan deposits. The alluvial fan lithofacies is subdivided into upper and lower sections. The upper section consists of relatively coarse-grained sediments deposited in a higher-energy environment. The lower section consists of a fine-grained, clay-rich unit. This unit has been identified as low-energy piedmont deposits derived from upland soil that developed during a preglacial humid climate. The total thickness of the alluvial fan deposits is several thousands of feet. The water table of the Regional Aquifer is located in the fine-grained lower unit of alluvial fan deposits. The post-SFG alluvial fan deposits blanket the area around TA-V and compose the upper few tens of feet of the vadose zone. These deposits were derived primarily from alluvial fans that developed from Coyote Canyon to the east.

No evidence of groundwater perching above the Regional Aquifer has been observed in TA-V. Based on moisture content measurements of vadose zone sediment samples, minimal moisture remains in the vadose zone from historical wastewater disposal in TA-V (SNL/NM, September 2015).

The long-term average annual precipitation at the Albuquerque International Sunport is approximately 8.84 in. (Chapter 2.0, Section 2.6.2.1). Most of the precipitation falls in the summer months, mainly in the form of brief heavy rains associated with thunderstorms. Estimates of evapotranspiration for the KAFB area range from 95 to 99% of the annual rainfall (SNL/NM, February 1998). Precipitation as a source of aquifer recharge is considered minimal and is unlikely to have been a mechanism for transporting contaminants through the approximately 500-ft-thick vadose zone in TA-V.

Tijeras Arroyo and Arroyo del Coyote are located to the north and northeast of TA-V, respectively. The flow of surface water in the arroyos consists of brief ephemeral flows from mountainous drainages located to the east. Part of the recharge derived from infiltration of these flows is returned to the atmosphere through evapotranspiration. Some water that infiltrates the arroyo channels may move past the root zone and provide some local recharge. However, the distance between these ephemeral channels and TA-V precludes a significant effect on the local groundwater flow and contaminant transport. The active channels for Tijeras Arroyo and Arroyo del Coyote are located approximately 1.7 and 0.6 mi from TA-V, respectively.

Horizontal hydraulic conductivities for the alluvial fan sediments were determined using aquifer pumping tests and slug tests. Aquifer pumping and recovery data were collected from two monitoring wells, AVN-1 and TAV-MW2, and the hydraulic conductivities were 38.3 and 0.09 ft/day, respectively. Slug tests were conducted at all 21 monitoring wells. The horizontal hydraulic conductivities ranged from 0.04 to 30.82 ft/day. The wide range of hydraulic conductivities is attributed to the textural heterogeneities associated with the alluvial fan lithofacies. To reduce the bias of a few higher values, a geometric mean was calculated using the slug test results from the 21 monitoring wells. The geometric mean hydraulic conductivity was 1.44 ft/day.

Vertical hydraulic conductivity is typically estimated to be one-tenth to one-hundredth the horizontal hydraulic conductivity. Vertical hydraulic gradients were calculated for the three monitoring well pairs (TAV-MW5 and TAV-MW13, TAV-MW6 and TAV-MW7, TAV-MW8 and TAV-MW9) using the publicly available U.S. Environmental Protection Agency (EPA) online tool. Using October 2024 groundwater elevations, the average vertical hydraulic gradient for the three pairs was downward at 0.04 ft/ft.

The geochemical signatures (cations and anions) for groundwater samples collected from all the monitoring wells are similar, and the groundwater in TA-V is classified as a calcium-bicarbonate type (SNL/NM, September 2015).

5.1.5.3 Direction of Groundwater Flow

Groundwater flows predominantly from east to west in the vicinity of TA-V. To the west of TA-V, groundwater flow becomes more northerly in response to pumping by KAFB, Albuquerque Bernalillo County Water Utility Authority (ABCWUA), and Veterans Affairs (VA) production wells located near the northern boundary of KAFB.

Table 5-2 lists the water levels measured in October 2024 at the 17 active TAVG AOC monitoring wells. Note that 14 are screened across the water table and 3 (TAV-MW7, TAV-MW9, and TAV-MW13) are screened deeper in the Regional Aquifer.

Figure 5-4 shows the CY 2024 potentiometric surface of the TAVG AOC. The general orientation of the localized potentiometric surface contours is consistent with the site-wide potentiometric surface map (Plate 1). The potentiometric surface indicates that the localized groundwater flow is predominantly to the southwest. The horizontal hydraulic gradient ranges from 0.002 to 0.008 ft/ft. The horizontal groundwater flow velocity was calculated from the range of horizontal hydraulic conductivities (0.04 to 30.82 ft/day), the range of horizontal hydraulic gradients (0.002 to 0.008 ft/ft), and an effective porosity of 0.25. The estimates for linear groundwater flow velocity range greatly (approximately three orders of magnitude), from 0.12 to 360 ft/yr.

Figure 5-4 shows a subtle groundwater mound in the potentiometric surface of the TAVG AOC. The groundwater mound is most likely an artifact of laterally variable water level declines within the heterogeneous and anisotropic aquifer that is undergoing regional drainage due to the combined effect of pumping by KAFB, ABCWUA, and VA production wells. Mounding in TA-V occurs where the sediments have lesser degrees of hydraulic conductivity than the surroundings and thus drain relatively slower.

The TAVG AOC hydrographs (Attachment 5D, Figures 5D-1 through 5D-4) show the groundwater elevation fluctuations for the 17 active TAVG AOC monitoring wells. The groundwater elevations at all the monitoring wells have steadily declined due to pumping of the Regional Aquifer by KAFB, ABCWUA, and VA production wells. The decline rates range from 0.40 to 0.77 ft/yr, with an average decline rate of 0.62 ft/yr. In CY 2024, the groundwater elevation declined fastest at monitoring well TAV-MW3 and slowest at monitoring wells TAV-MW13 and TAV-MW16. The decline of the water table is expected to continue as long as pumping by production wells in the region continues.

Since late 2008, groundwater elevations at Regional Aquifer wells in the northern part of KAFB have shown an increasing trend. Presumably, this is in response to the ABCWUA transitioning to surface water for potable water supplies and decreased dependence on the ABCWUA production wells immediately north of KAFB. However, this trend has not been seen as far south as TA-V.

Table 5-2
Groundwater Elevation Data for the Technical Area-V Groundwater Area of Concern, October 2024

Well ID	Measuring Point (ft amsl) NAVD 88	Date Measured	Depth to Water (ft btoc)	Groundwater Elevation (ft amsl)
LWDS-MW1	5423.83	2-Oct-2024	507.75	4916.08
TAV-MW2	5427.33	2-Oct-2024	512.01	4915.32
TAV-MW3	5464.30	2-Oct-2024	550.24	4914.06
TAV-MW4	5427.89	2-Oct-2024	512.14	4915.75
TAV-MW5	5408.71	3-Oct-2024	496.97	4911.74
TAV-MW6	5431.17	2-Oct-2024	515.48	4915.69
TAV-MW7	5430.40	2-Oct-2024	517.50	4912.90
TAV-MW8	5417.00	2-Oct-2024	500.73	4916.27
TAV-MW9	5416.27	2-Oct-2024	503.49	4912.78
TAV-MW10	5437.03	2-Oct-2024	521.81	4915.22
TAV-MW11	5440.12	2-Oct-2024	524.46	4915.66
TAV-MW12	5435.72	2-Oct-2024	521.23	4914.49
TAV-MW13	5409.02	3-Oct-2024	499.43	4909.59
TAV-MW14	5441.52	2-Oct-2024	528.24	4913.28
TAV-MW15	5437.32	2-Oct-2024	522.93	4914.39
TAV-MW16	5448.34	2-Oct-2024	534.48	4913.86
TAV-MW17	5443.92	2-Oct-2024	529.71	4914.21

Notes:
amsl = above mean sea level
btoc = below top of casing (the measuring point)
ft = foot (feet)
ID = identifier
LWDS = Liquid Waste Disposal System
MW = Monitoring Well
NAVD 88 = North American Vertical Datum of 1988
TAV = Technical Area-V

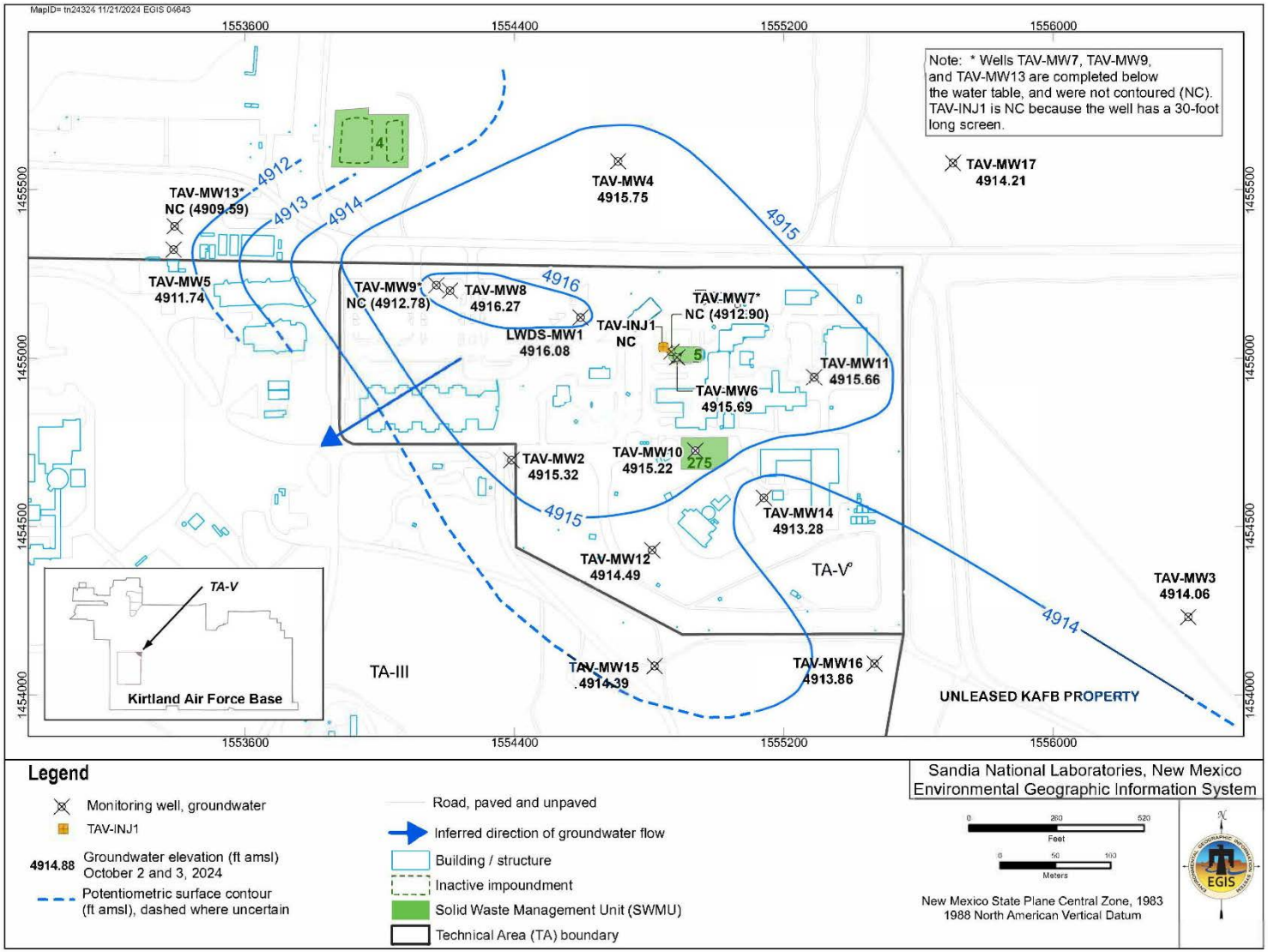


Figure 5-4
Potentiometric Surface of the Regional Aquifer in the Technical Area-V Groundwater Area of Concern (October 2024)

5.1.5.4 Contaminant Sources

The groundwater contamination in the TAVG AOC is not the result of surface contamination from a single SWMU. Before 1992, the majority of wastewater disposal in TA-V occurred at SWMUs 4, 5, and 275 (Figures 5-2 and 5-3). Table 5-3 presents the disposal periods, estimated disposal volumes, types of wastewater, and design characteristics for the three high-discharge SWMUs. Small volumes of TCE and other organic solvents were presumably present in wastewater disposed of at the LWDS Drain Field (SWMU 5) from 1962 to 1967, the LWDS Surface Impoundments (SWMU 4) from 1967 to 1972, and the TA-V Seepage Pits (SWMU 275) from the 1960s to the early 1980s, when disposal practices were modified to protect the environment. Disposal of wastewater at the TA-V Seepage Pits (SWMU 275) continued from the early 1980s until 1992, but the wastewater contained no organic solvents such as TCE. This continued discharge of wastewater likely flushed residual contaminants to the aquifer. After 1992, the sanitary waste and wastewater piping were connected to the site-wide KAFB sanitary sewer system, which drains to the ABCWUA interceptor line. Upon cessation of wastewater disposal to the subsurface, vertical pathways to the aquifer were drained by gravity.

Table 5-3 shows that the estimated total discharge volume ranged from 48.5 to 68.5 million gal. SWMU 275 had the greatest discharge volume, accounting for up to 73% of the total discharge in TA-V. The average disposal rate for the three SWMUs ranged from approximately 1 to 2.4 million gal/yr. The types of wastewater consisted of reactor cooling water, industrial water (from sinks and drains in radiochemistry laboratories and assembly shops), and septic (sanitary sewer) water.

Table 5-3
Wastewater and Septic Water Disposal History for Technical Area-V

Disposal Site	Date in Use	Estimated Volume (gal)	Percentage of Total Volume[a]	Average Disposal Rate (gal/yr)	Primary Types of Wastewater	Design Characteristics
SWMU 4 - LWDS Surface Impoundments	1967–1972[b]	12 million	18 – 25	2.4 million	Reactor cooling water and industrial water	Two unlined impoundments, total 0.4 acres
SWMU 5 - LWDS Drain Field	1962–1967	6.5 million	9 – 13	1.3 million	Reactor cooling water and industrial water	One buried perforated horizontal pipe, 60 ft long, 36 ft deep, 3 ft diameter
SWMU 275 - TA-V Seepage Pits	1960s –1992	30 to 50 million	62 – 73	1 to 1.6[c] million	Septic water and industrial water	Six buried open-bottom cylinders, 20 ft deep, 6.5 ft diameter
Total Range for Three Sites	1962–1992	48.5 to 68.5 million				

Notes:
[a] Percentage calculated using the total range of discharge for three sites (48.5 to 68.5 million gal).
[b] Used intermittently for discharge of local surface water runoff and wastewater from sinks and floor drains until 1992. The unmonitored volume is assumed to be negligible.
[c] Assumes 30 years of discharge at the seepage pits.
ft = foot (feet)
gal = gallons
LWDS = Liquid Waste Disposal System
SWMU = Solid Waste Management Unit
TA-V = Technical Area-V
yr = year

Elevated nitrate concentrations in the groundwater in TA-V are likely derived from sanitary waste disposals to the subsurface. Sanitary waste disposals continued until 1992, when the disposals were routed to the site-wide sanitary sewer system. Nitrate is considered a conservative constituent with regard to transport because it is highly soluble in water, not typically sorbed to sediments, and not bio-transformed under aerobic groundwater conditions like those exhibited in TA-V. Therefore, any locally derived elevated nitrate concentrations were most likely transported through the vadose zone along with the wastewater and sanitary waste discharges.

Historical analytical results from monitoring well LWDS-MW2, located immediately north of the LWDS Surface Impoundments (SWMU 4), indicated that the wastewater disposed of at the surface impoundments did not impact groundwater. The large surface area of the impoundments (approximately 0.4 acres) could have facilitated significant evaporation of wastewater and VOCs. This likely minimized the depth of percolation. TCE was never detected in groundwater samples collected from monitoring well LWDS-MW2, and except for one anomalous detection of 12.3 mg/L in May 2019 (SNL/NM, June 2020), nitrate concentrations never exceeded the EPA MCL of 10 mg/L. LWDS-MW2 was decommissioned in February 2023 (SNL/NM, July 2023).

The NMED-suggested background concentration for nitrate in groundwater is 4 mg/L (NMED, September 1997). This value is based on an NMED study (NMED, January 1995). However, that study concluded that the background concentration was not reliably established due to the lack of suitable (convincingly uncontaminated) wells available at that time. Nitrate concentrations above 4 mg/L had been reported for monitoring wells AVN-1 and AVN-2, which were decommissioned in February 2023 (SNL/NM, July 2023). These two monitoring wells were co-located approximately 310 ft northeast and upgradient of TA-V and historically had similar nitrate concentrations, even though AVN-1 was screened 75 ft deeper than ANV-2. The maximum nitrate concentration for AVN-1 was 11.8 mg/L in June 2009. The maximum nitrate concentration for AVN-2 was 10.7 mg/L in December 2004. In April 2023, monitoring well TAV-MW17 was installed in the vicinity of AVN-1 and AVN-2. The nitrate concentrations at TAV-MW17 have been below the EPA MCL of 10 mg/L and below the historical maximum concentrations at AVN-1 and AVN-2.

Elevated nitrate concentrations at monitoring well TAV-MW17 may be related to the leaching of naturally occurring nitrate in the vadose zone by the infiltration of surface water through nitrate-bearing soils along Arroyo del Coyote. Elevated background is likely related to sedimentary deposits or naturally occurring nitrate from decayed vegetation that had accumulated beneath the Arroyo del Coyote. Examples of such occurrences have been documented at several locations in the arid southwest United States (Walvoord et al., November 2003). Naturally occurring nitrate sources are also discussed in Chapter 6.0.

5.1.5.5 Contaminant Distribution and Transport in Vadose Zone

Contaminant migration in the subsurface is primarily controlled by infiltration of wastewater historically disposed of in TA-V and the low permeability of the sedimentary units in the vadose zone and Regional Aquifer. Limited amounts of natural recharge are a minor factor, with possible sources including precipitation and ephemeral flows in nearby arroyos.

The vadose zone, consisting of approximately 500 ft of unconsolidated alluvial fan sediments, forms the pathway for COC transport from surface and shallow subsurface contamination to the aquifer. The upper section of the alluvial fan sediments is relatively coarse-grained, becoming fine-grained and clay-rich at depths ranging from approximately 320 to 360 ft bgs across TA-V. The hydraulic properties of the vadose zone are highly variable and anisotropic because of the heterogeneous textures, lenticularity, layering, and variations in carbonate cementation. Percolation of wastewater from the LWDS Drain Field (SWMU 5), LWDS Surface Impoundments (SWMU 4), and TA-V Seepage Pits (SWMU 275) occurred along preferential pathways through the thick vadose zone. Vertical flow through the discontinuous, layered,

lenticular sediments in the vadose zone was most likely attenuated or diverted at horizons of varying hydraulic properties.

Vapor migration in the vadose zone is a possible transport mechanism contributing to the distribution and transport of VOCs in groundwater. Within the LWDS Drain Field (SWMU 5), trace quantities of TCE, tetrachloroethene, and benzene were detected in shallow soil-vapor samples collected in 1994 (SNL/NM, March 1999). The possibility of vadose zone contamination was further investigated with the installation of monitoring wells TAV-MW6, TAV-MW7, TAV-MW8, and TAV-MW9 in March and April 2001. The results of soil-core and soil-vapor samples collected during well installation showed no significant residual VOCs in the vadose zone. Also, there was no evidence of excessive moisture in the vadose zone sediments; therefore, no significant residual wastewater was present in the vadose zone beneath the LWDS Drain Field (SNL/NM, October 2001). In the vicinity of the TA-V Seepage Pits (SWMU 275), trace quantities of TCE, tetrachloroethene, benzene, toluene, and total xylene were detected in soil-vapor samples collected during passive surficial characterization studies conducted in 1994 and 1995 (SNL/NM, March 1999).

To characterize the vertical extent of VOCs in the vadose zone at SWMUs 5 and 275, three soil-vapor wells (TAV-SV01, TAV-SV02, and TAV-SV03) were installed in 2011 (Figure 5-2). Each soil-vapor well was constructed with a series of ten 1-ft-long stainless-steel screens set at 50-ft intervals from 50 to 500 ft bgs. The three soil-vapor wells were sampled for eight consecutive quarters (April 2011 through March 2013). The samples were analyzed for VOCs, including TCE. The analytical results were previously reported in the CY 2013 AGMR. TCE was the most prevalent VOC in the vadose zone. Trend analysis indicated that soil-vapor concentrations have stabilized in the vadose zone (SNL/NM, September 2015). Without an active driving force (such as wastewater disposal), the TCE in the vadose zone is unlikely to act as an ongoing contaminant source to the groundwater. TCE is hydrophobic, with a water solubility of 1,100 mg/L at 20°C. Some TCE could be retained in the vadose zone due to sorption to fine-grained materials and dissolution in pore water.

5.1.5.6 Contaminant Distribution and Transport in Groundwater

TCE and nitrate concentrations in groundwater exceed the EPA MCLs at the locations where up to 86% of the TA-V wastewater and sanitary waste was disposed (SWMUs 5 and 275). Contaminant transport mechanisms in groundwater potentially include advection, dispersion, diffusion, biodegradation, and sorption (SNL/NM, September 2015). Groundwater monitoring results over the past three decades indicate that advection is not the main force driving contamination migration, most likely because of the low localized groundwater flow velocities. With limited advection, dispersion and diffusion become important transport mechanisms.

The potential for natural (intrinsic) biodegradation to occur in the groundwater in TA-V was evaluated in two assessments. The anaerobic biodegradation assessment (SNL/NM, July 2005, Attachment D) involved groundwater sample collection and analysis for dissolved gases and dechlorination products. This assessment quantitatively evaluated 18 parameters and concluded that anaerobic reductive dechlorination was not a significant process contributing to the natural attenuation of VOCs. Nitrate degradation was qualitatively assessed, and biologically mediated transformation of nitrate was not likely to occur. The aerobic biodegradation assessment (SNL/NM, July 2005, Attachment E) involved groundwater sample collection and coupled enzymatic probes with DNA analysis of the native groundwater. This assessment concluded that aerobic TCE cometabolism by the indigenous microbial population could be an existing mechanism for natural attenuation at the site. However, cometabolic reactions under aerobic conditions require the presence of methane or another similar substrate that is not present in the TAVG AOC (SNL/NM, September 2015). Denitrification was not evaluated in this study.

A study of denitrification parameters and isotopic signatures was conducted in 2013. Groundwater samples were collected from eight monitoring wells (LWDS-MW1, TAV-MW2, TAV-MW5, TAV-MW6, TAV-MW7, TAV-MW8, TAV-MW9, and TAV-MW10) and were analyzed for stable dual-isotopes (nitrogen-14/nitrogen-15 and oxygen-16/oxygen-18), dissolved gases (nitrogen and argon), and total organic carbon. The study concluded that natural denitrification was not apparent in the TAVG AOC (Madrid et al., June 2013).

While nitrate does not sorb to sediments, TCE is a hydrophobic organic compound and sorbs to the organic matter in the aquifer matrix. Sorption is also a reversible process. As the dissolved contaminant concentration in groundwater decreases due to advection (although limited), the initially sorbed TCE portion tends to desorb and reenter groundwater through equilibration processes.

In summary, the relatively stable TCE and nitrate concentrations in the TAVG AOC can be attributed to the slow dispersion and diffusion processes and the reversible sorption process (for TCE). The CY 2024 TCE and nitrate results are discussed in Section 5.6.

5.1.5.7 Potential Receptors of Technical Area-V Groundwater Contamination

The potential for contaminated groundwater from the TAVG AOC to reach receptors was evaluated in the 2015 CCM. Production wells completed in the Regional Aquifer are the only potential exposure points where the COCs in the groundwater could reach human receptors. However, no consumptive use of groundwater currently occurs within 2.8 mi of TA-V. KAFB-4, the nearest production well, is located approximately 2.8 mi north-northwest of TA-V. Additional production wells are located farther north near the northern boundary of KAFB and are operated by KAFB, ABCWUA, and the VA. MODFLOW modeling results (SNL/NM, July 2005) demonstrated that contaminants in the groundwater in TA-V do not pose a threat to those production wells. The proposed Mesa del Sol production well field, located approximately 3 mi west of TA-V, is unlikely to be a receptor in the foreseeable future because it is improbable that KAFB and ABCWUA pumping will cease and that the groundwater flow path will revert to a westward direction toward Mesa del Sol.

There is no current or anticipated use of groundwater in the immediate vicinity of TA-V. Therefore, there is no foreseeable risk to human health or the environment from the groundwater contamination in the TAVG AOC or threat to the beneficial use of groundwater downgradient of TA-V.

5.2 Regulatory Requirements

TAVG AOC groundwater monitoring is subject to the Consent Order and the comprehensive site-wide groundwater monitoring plan submitted to the NMED annually.

The NMED Hazardous Waste Bureau provides regulatory oversight of SNL/NM Environmental Restoration Operations and enforces regulations mandated by the Resource Conservation and Recovery Act (RCRA). All SWMUs and AOCs at SNL/NM are listed in the *Resource Conservation and Recovery Act Facility Operating Permit for Sandia National Laboratories, EPA ID No. NM5890110518* (RCRA Permit) (NMED January 2015a, as modified).

In April 2004, the Consent Order took effect and regulatory authority for corrective action requirements was transferred from the RCRA Permit to the Consent Order. The Consent Order identifies the groundwater in TA-V as an AOC and defines all TAVG AOC corrective action requirements.

In response to the Consent Order requirements for site characterization and the development of a Corrective Measures Evaluation (CME), DOE/NNSA and SNL/NM personnel submitted the *Current Conceptual Model of Groundwater Flow and Contaminant Transport at Sandia National Laboratories/New Mexico Technical Area-V* (SNL/NM, April 2004a) and the *Corrective Measures Evaluation Work Plan, Technical Area-V Groundwater* (2004 CME Work Plan) (SNL/NM, April 2004b) to the NMED in April 2004. The NMED approved the 2004 CME Work Plan with modification (NMED, October 2004) and SNL/NM personnel updated it in December 2004 (2004 CME Work Plan, Revision 0) (SNL/NM, December 2004).

After implementing the 2004 CME Work Plan, Revision 0, DOE/NNSA and SNL/NM personnel submitted the *Corrective Measures Evaluation Report for Technical Area-V Groundwater* (2005 CME Report) to the NMED in July 2005 (SNL/NM, July 2005). The NMED subsequently issued three Notices of Disapproval (NODs) for the 2005 CME Report in July 2008, August 2009, and December 2009, respectively (NMED, July 2008, August 2009, December 2009). DOE/NNSA and SNL/NM personnel responded to these NODs in April 2009, November 2009, and February 2010, respectively (DOE, April 2009, November 2009, February 2010). These NOD responses contained an appendix titled Technical Area-V Groundwater Investigation Work Plan, which proposed installing four monitoring wells and three soil-vapor wells to meet the NMED characterization requirements. In May 2010, the NMED issued a Notice of Conditional Approval for the Technical Area-V Groundwater Investigation Work Plan, Revision 2 (NMED, May 2010).

Since the 2005 CME Report, a substantial body of information from the additional monitoring wells and soil-vapor wells has become available. Accordingly, in 2013, DOE/NNSA and SNL/NM personnel requested that the 2005 CME Report be withdrawn from review and replaced with an updated CCM/CME report by November 2014 (DOE, December 2013). The NMED approved the request (NMED, December 2013).

In 2014, DOE/NNSA, DOE Environmental Management, SNL/NM, and NMED personnel agreed to conduct an ISB treatability study to address the groundwater contamination in the TAVG AOC. To allow development of the technical approach and preparation of a work plan for the ISB treatability study, DOE/NNSA and SNL/NM personnel requested a two-year extension for submitting the updated CCM/CME report (DOE, November 2014). The NMED approved the request (NMED, January 2015b).

DOE/NNSA and SNL/NM personnel submitted the 2015 CCM to the NMED on October 20, 2015 (DOE, October 2015) to provide the background information, framework, and technical basis for the ISB treatability study. The NMED approved the 2015 CCM on November 30, 2015 (NMED, November 2015).

In anticipation of conducting a phased ISB treatability study, DOE/NNSA and SNL/NM personnel requested, and the NMED approved, a milestone extension for submitting the updated CCM/CME report to May 20, 2022 (DOE, March 2016; NMED, April 2016).

DOE/NNSA and SNL/NM personnel began phase I of the treatability study in November 2017, completed phase I in May 2021, and documented the operational details and study results in the *Phase I Treatability Study Report for In-Situ Bioremediation at the Technical Area-V Groundwater Area of Concern* (Phase I Treatability Study Report) (SNL/NM, March 2022) submitted to the NMED in April 2022 (DOE, April 2022a). Based on the phase I treatability study results, which indicated that ISB is not a feasible technology for low TCE concentrations with existing aquifer characteristics in the TAVG AOC, DOE/NNSA and SNL/NM personnel recommended not proceeding to phase II of the treatability study. The NMED subsequently approved the Phase I Treatability Study Report and concurred with the recommendation (NMED, June 2022).

After completing the phase I treatability study in May 2021, DOE/NNSA and SNL/NM personnel sampled the phase I treatment zone for an additional year to supplement the CME process. In April 2022, DOE/NNSA and SNL/NM personnel requested, and the NMED approved, another extension for submitting the updated CCM/CME report to May 20, 2024 (DOE, April 2022b; NMED, May 2022). DOE/NNSA and SNL/NM personnel submitted the 2024 CCM/CME Report to the NMED on April 24, 2024 (DOE, April 2024).

5.3 Scope of Activities

CY 2024 TAVG AOC groundwater monitoring activities included:

- Quarterly water level measurements at 17 TAVG AOC monitoring wells.
- Semiannual collection and analysis of groundwater samples from 17 TAVG AOC monitoring wells in January/February and July/August 2024.
- Completion of perchlorate monitoring at monitoring well TAV-MW17 in the first quarter of CY 2024.
- Preparation of analytical results tables (Attachment 5B), concentration trend plots (Attachment 5C), and hydrographs (Attachment 5D).
- Submittal of the *Monitoring Well TAV-MW17 Installation and Monitoring Well AVN-1, AVN-2, and LWDS-MW2 Decommissioning Report (Revised)* (SNL/NM, July 2023). The NMED approved the revised report (NMED, March 2024).
- Submittal of the *Comprehensive Site-Wide Groundwater Monitoring Plan, Calendar Year 2025* (SNL/NM, April 2024). The NMED approved the plan (NMED, July 2024).
- Submittal of the 2024 CCM/CME Report.
- Submittal of the Well Plugging Plan of Operations for TAV-INJ1 to the New Mexico Office of the State Engineer (NMOSE) (DOE, October 2024). The NMOSE approved the plan (NMOSE, November 2024).

Table 5-4 summarizes both sampling events; Table 5-5 lists the analytes for each monitoring well for each sampling event. The tables reflect the NMED-approved *Comprehensive Site-Wide Groundwater Monitoring Plan (Revised), Calendar Year 2024* (CY 2024 Comprehensive Site-Wide Plan) (SNL/NM, April 2023b; NMED, October 2023b), unless specified otherwise (see table notes).

Table 5-4
Technical Area-V Groundwater Area of Concern Monitoring Well Network and Sampling Dates, Calendar Year 2024

Date of Sampling Event	Wells Sampled	Monitoring Plan
January/February 2024	LWDS-MW1, TAV-MW2, TAV-MW4, TAV-MW6, TAV-MW8, TAV-MW10, TAV-MW11, TAV-MW12, TAV-MW14, TAV-MW16, and TAV-MW17*	CY 2024 Comprehensive Site-Wide Plan (SNL/NM, April 2023b)
July/August 2024	LWDS-MW1, TAV-MW2, TAV-MW3, TAV-MW4, TAV-MW5**, TAV-MW6, TAV-MW7, TAV-MW8, TAV-MW9, TAV-MW10, TAV-MW11, TAV-MW12, TAV-MW13, TAV-MW14, TAV-MW15, TAV-MW16, and TAV-MW17*	CY 2024 Comprehensive Site-Wide Plan (SNL/NM, April 2023b)

Notes:
*Completed perchlorate monitoring at TAV-MW17 in the first quarter of CY 2024. Thereafter, TAV-MW17 requires only semiannual sampling for compliance parameters and annual sampling for waste characterization parameters (see Section 5.6.1).
**TAV-MW5 was sampled on July 30, 2024, but the samples arrived at the analytical laboratory outside of temperature requirements. The well was resampled for VOCs and NPN on August 1, 2024 with an environmental duplicate sample.

CY = calendar year
LWDS = Liquid Waste Disposal System
MW = Monitoring Well
NPN = nitrate plus nitrite
SNL/NM = Sandia National Laboratories, New Mexico
TAV = Technical Area-V
VOC = volatile organic compound

Table 5-5
Analytes for Technical Area-V Groundwater Area of Concern Monitoring Wells, Calendar Year 2024

Analytes	January/February 2024	
Alkalinity[a,c] Major Anions (Bromide, Chloride, Fluoride, Sulfate)[a,c] Gamma Spectroscopy (short list[a,b,c]) Gross Alpha/Beta Activity[a,c] NPN Perchlorate[c] TAL Metals plus Molybdenum and Total Uranium[a,c] Tritium[a,c] VOCs	LWDS-MW1 LWDS-MW1 (Duplicate) TAV-MW2 TAV-MW4 TAV-MW6 TAV-MW8 TAV-MW8 (Duplicate)	TAV-MW10 TAV-MW11 TAV-MW11 (Duplicate) TAV-MW12 TAV-MW14 TAV-MW16 TAV-MW17
Analytes	**July/August 2024**	
Alkalinity[a] Major Anions (Bromide, Chloride, Fluoride, Sulfate)[a] Gamma Spectroscopy (short list[a,b]) Gross Alpha/Beta Activity[a] NPN TAL Metals plus Total Uranium[a] Tritium[a] VOCs	LWDS-MW1 TAV-MW2 TAV-MW2 (Duplicate) TAV-MW3 TAV-MW4 TAV-MW5 TAV-MW5 (Duplicate) TAV-MW6 TAV-MW7 TAV-MW8 TAV-MW9 TAV-MW9 (Duplicate)	TAV-MW10 TAV-MW11 TAV-MW12 TAV-MW13 TAV-MW13 (Duplicate) TAV-MW14 TAV-MW15 TAV-MW16 TAV-MW16 (Duplicate) TAV-MW17

Notes:
[a]Analyses performed for waste characterization purposes.
[b]Gamma spectroscopy short list includes americium-241, cesium-137, cobalt-60, and potassium-40.
[c]TAV-MW17 only, as a best management practice.

ID = identifier
LWDS = Liquid Waste Disposal System
MW = Monitoring Well
NPN = nitrate plus nitrite
TAL = Target Analyte List
TAV = Technical Area-V
VOC = volatile organic compound

5.4 Field Procedures and Measurements

Chapter 1.0, Section 1.3 describes how the CY 2024 TAVG AOC groundwater data were collected and analyzed.

5.5 Analytical Methods

The analytical laboratory analyzed the groundwater samples using the applicable EPA and DOE-specified methods and protocols identified in Chapter 1.0, Section 1.3.2 (Tables 1-5 and 1-6).

Nitrate concentrations were measured by a nitrate plus nitrite (NPN) as nitrogen analytical method. Historical TAVG AOC groundwater analyses have demonstrated that nitrite concentrations are below the method detection limit (MDL) and do not contribute to the results of NPN analyses. Therefore, NPN results in this chapter and its attachments represent nitrate concentrations, which are also referred to as NPN concentrations.

5.6 Summary of Calendar Year 2024 Groundwater Monitoring Results

The following sections summarize the CY 2024 TAVG AOC groundwater monitoring results. Attachment 5B (Tables 5B-1 through 5B-8) presents the analytical results and field water quality parameter measurements for both sampling events. The analytical results were reviewed and qualified during data validation and include the laboratory and validation qualifiers. Attachment 5C (Figures 5C-1 through 5C-8) presents concentration trend plots for the monitoring wells where TCE and NPN concentrations exceeded the EPA MCLs. Attachment 5D (Figures 5D-1 through 5D-4) present the TAVG AOC hydrographs.

The analytical results are compared to the EPA MCLs, where established. The analytical results and analytical laboratory data packages (Data Package 4) were submitted to the SNL/NM Customer Funded Records Center for retention.

5.6.1 Analytical Results for Environmental Samples

The environmental samples (Table 5-5) were analyzed for VOCs, NPN, and perchlorate (monitoring well TAV-MW17 only).

Table 5B-1 presents the VOC results; Table 5B-2 lists the corresponding MDLs. The following five VOCs were qualified during data validation as detected in the environmental samples:

- Chloroform
- cis-1,2-dichloroethene
- Methylene chloride
- Toluene
- TCE

TCE was the only VOC detected at concentrations exceeding the EPA MCL of 5 µg/L. TCE exceeded the EPA MCL in the environmental samples collected from five monitoring wells (LWDS-MW1, TAV-MW4, TAV-MW6, TAV-MW8, and TAV-MW10), with a maximum concentration of 9.11 µg/L in the February 2024 TAV-MW10 environmental sample. Historically, the highest TCE concentrations in TA-V have typically been detected at LWDS-MW1.

Figures 5C-1 through 5C-5 present the TCE concentration trend plots for the five monitoring wells. These plots show the following:

- LWDS-MW1 (Figure 5C-1): The TCE concentrations were 5.58/6.60 and 6.11 µg/L in February and August 2024, respectively. The overall TCE trend is decreasing, with all concentrations above the EPA MCL of 5 µg/L.
- TAV-MW4 (Figure 5C-2): The TCE concentrations were 5.70 and 6.31 µg/L in February and August 2024, respectively. The TCE concentration exceeded the EPA MCL of 5 µg/L for the first time in May 2019. Since then, the overall TCE trend has been increasing, with most concentrations above the EPA MCL.
- TAV-MW6 (Figure 5C-3): The TCE concentrations were 7.64 and 7.86 µg/L in February and August 2024, respectively. The TCE concentration exceeded the EPA MCL of 5 µg/L for the first time in August 2006. Since then, the TCE concentrations increased, reaching the highest concentration of 18.8 µg/L in March 2014, and thereafter have decreased while remaining consistently above the EPA MCL.
- TAV-MW8 (Figure 5C-4): The TCE concentrations were 4.09 and 5.11 µg/L in February and August 2024, respectively. The TCE concentration exceeded the EPA MCL of 5 µg/L in February 2019, the first time since November 2003. The TCE concentrations have fluctuated above and below the EPA MCL since February 2019.
- TAV-MW10 (Figure 5C-5): The TCE concentrations were 9.11 and 8.82 µg/L in February and August 2024, respectively. The overall TCE trend is slightly decreasing, with all concentrations above the EPA MCL of 5 µg/L.

Historically, TCE has also been detected at concentrations below the EPA MCL of 5 µg/L at five monitoring wells (TAV-MW2, TAV-MW11, TAV-MW12, TAV-MW14, and TAV-MW16).

After its installation in April 2023, the TCE concentrations at monitoring well TAV-MW17 ranged from 0.44 to 0.52 µg/L (all J-qualified) in CY 2023. This range is below the EPA MCL of 5 µg/L. Therefore, per the guidelines in the NMED-approved modifications to the TAVG AOC groundwater monitoring program (DOE, August 2022; NMED, December 2022), TAV-MW17 requires only semiannual sampling for compliance parameters and annual sampling for waste characterization parameters. TCE was not detected at TAV-MW17 in CY 2024.

TCE has never been detected at monitoring wells TAV-MW3, TAV-MW5, TAV-MW7, TAV-MW9, or TAV-MW15. The only detection of 0.410 µg/L (J-qualified) in May 2021 at monitoring well TAV-MW13 is considered an anomaly (SNL/NM, June 2022). Also, TCE was never detected at monitoring wells AVN-1, AVN-2, or LWDS-MW2 before they were decommissioned in February 2023.

Figure 5-5 shows the TCE isoconcentration contour for the July/August 2024 sampling event. Semiannual sampling started in CY 2023, and the second event included all 17 monitoring wells. Figure 5-5 shows only one TCE isoconcentration contour – a 5-µg/L contour. This is the first time in the TAVG AOC that the TCE concentrations at all monitoring wells have been below 10 µg/L during the calendar year. The general location and shape of the 5-µg/L contour have not changed significantly over the past several years.

Monitoring wells TAV-MW3, TAV-MW5, TAV-MW15, TAV-MW16, and TAV-MW17 are located farther from the contaminant sources to the east, west, south, southeast, and northeast, respectively (Figure 5-5). Monitoring well TAV-MW13 is located near TAV-MW5; the top of the screen in TAV-MW13 is 18.6 ft deeper than the bottom of the screen in TAV-MW5. These boundary monitoring

wells with no TCE detections (and minimum detection at TAV-MW16) define the lateral extent of TCE contamination.

Monitoring wells TAV-MW7 and TAV-MW9 are located near monitoring wells TAV-MW6 and TAV-MW8, respectively. The top of the screen in TAV-MW7 is 70.6 ft deeper than the bottom of the screen in TAV-MW6; the top of the screen in TAV-MW9 is 71.5 ft deeper than the bottom of the screen in TAV-MW8. TCE has never been detected at the two deeper monitoring wells, TAV-MW7 and TAV-MW9. The lack of TCE detection in deeper groundwater near the contaminant sources (SWMUs 5 and 275) indicates that VOCs have not migrated deeper into the Regional Aquifer.

Table 5B-3 presents the NPN results. NPN has historically been reported at low concentrations for each monitoring well in TA-V, ranging up to slightly above the EPA MCL of 10 mg/L. In CY 2024, NPN exceeded the EPA MCL in the environmental samples collected from two monitoring wells (LWDS-MW1 and TAV-MW10), with a maximum concentration of 12.9 mg/L in the February 2024 TAV-MW10 environmental sample. The NPN concentrations at LWDS-MW1 and TAV-MW10 have typically exceeded the EPA MCL.

Figures 5C-6 and 5C-7 present the NPN concentration trend plots for monitoring wells LWDS-MW1 and TAV-MW10, respectively. These plots show the following:

- LWDS-MW1 (Figure 5C-6): The NPN concentrations were 12.0 and 12.4 mg/L in February and August 2024, respectively. The overall NPN trend is slightly increasing, with most concentrations above the EPA MCL of 10 mg/L.
- TAV-MW10 (Figure 5C-7): The NPN concentrations were 12.9 and 12.4 mg/L in February and August 2024, respectively. The overall NPN trend is slightly increasing, with most concentrations above the EPA MCL of 10 mg/L.

NPN concentrations previously exceeded the EPA MCL of 10 mg/L in environmental samples collected from monitoring wells TAV-MW6 and TAV-MW14, as well as monitoring wells AVN-1, AVN-2, and LWDS-MW2 before they were decommissioned in February 2023. Monitoring well TAV-MW17 was installed in the vicinity of AVN-1 and AVN-2 after they were decommissioned (Section 5.1.5.4). The NPN concentrations at TAV-MW17 have been below the EPA MCL. Nitrate above the EPA MCL was also detected once at monitoring well TAV-MW5 in a split sample collected in November 1998 (soon after well installation) but has not been detected at the well since then.

Figure 5-6 shows the NPN isoconcentration contour for the July/August 2024 sampling event, during which all 17 monitoring wells were sampled (Table 5-5). The general location of the 10-mg/L contour has not changed significantly over the past several years, and the contour typically encloses monitoring wells LWDS-MW1 and TAV-MW10. The NPN concentrations at all the other monitoring wells are below 10 mg/L. For the three paired monitoring wells, TAV-MW5 and TAV-MW13, TAV-MW6 and TAV-MW7, and TAV-MW8 and TAV-MW9, the NPN concentrations are lower at the deeper-screened wells – TAV-MW13, TAV-MW7, and TAV-MW9 (Table 5B-3).

The TCE and NPN plumes for CY 2024 (Figures 5-5 and 5-6, respectively) are roughly co-located with a generally northwest-to-southeast orientation. The contaminants are present at low concentrations in the Regional Aquifer in the vicinity of the LWDS Drain Field (SWMU 5) and TA-V Seepage Pits (SWMU 275). The historical maximum TCE and NPN concentrations at monitoring well LWDS-MW1 are slightly offset from SWMU 5, suggesting that localized stratigraphic controls could have influenced contaminant migration in the 500-ft-thick vadose zone above the water table.

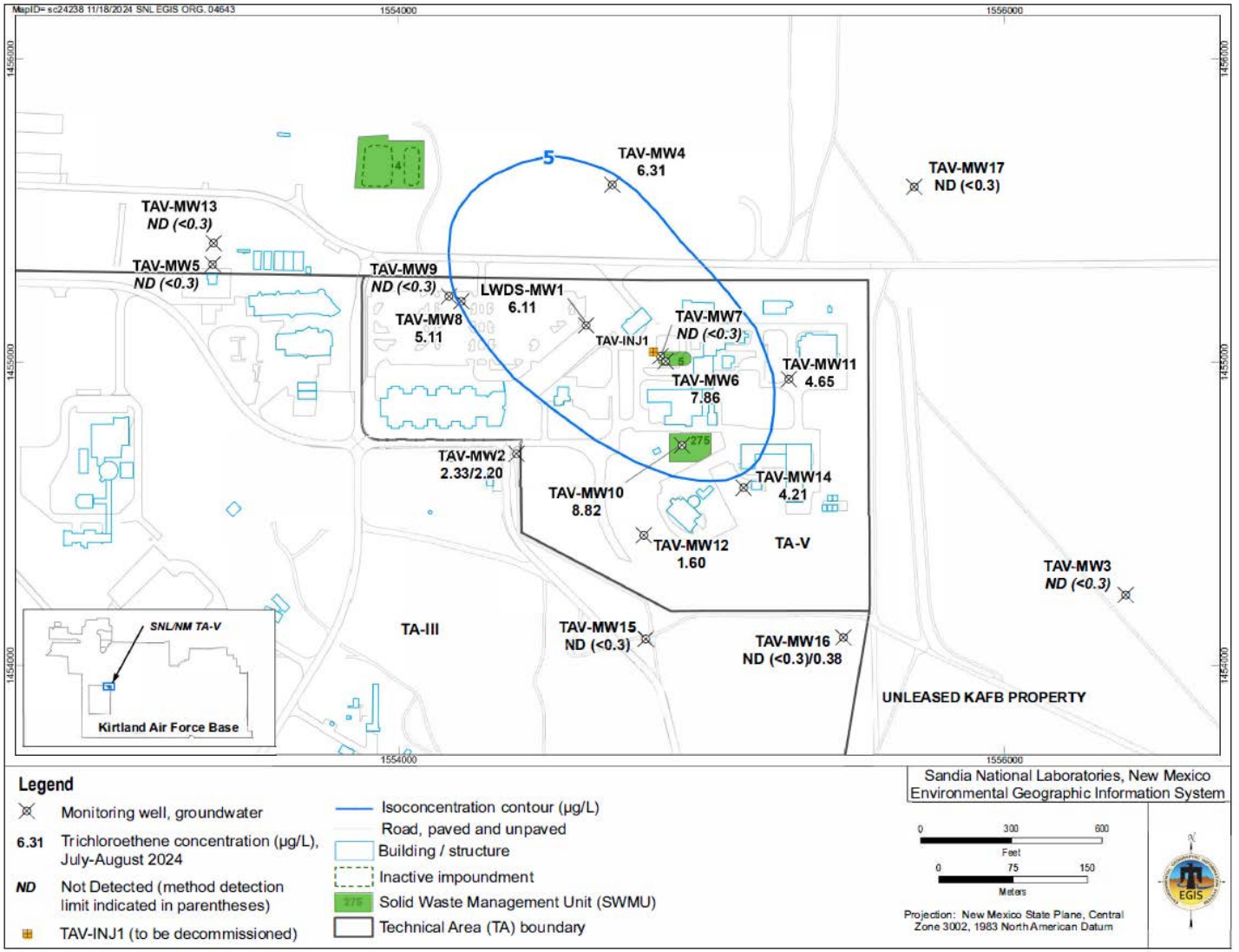


Figure 5-5
Distribution of Trichloroethene in Groundwater in the Technical Area-V Groundwater Area of Concern, July/August 2024

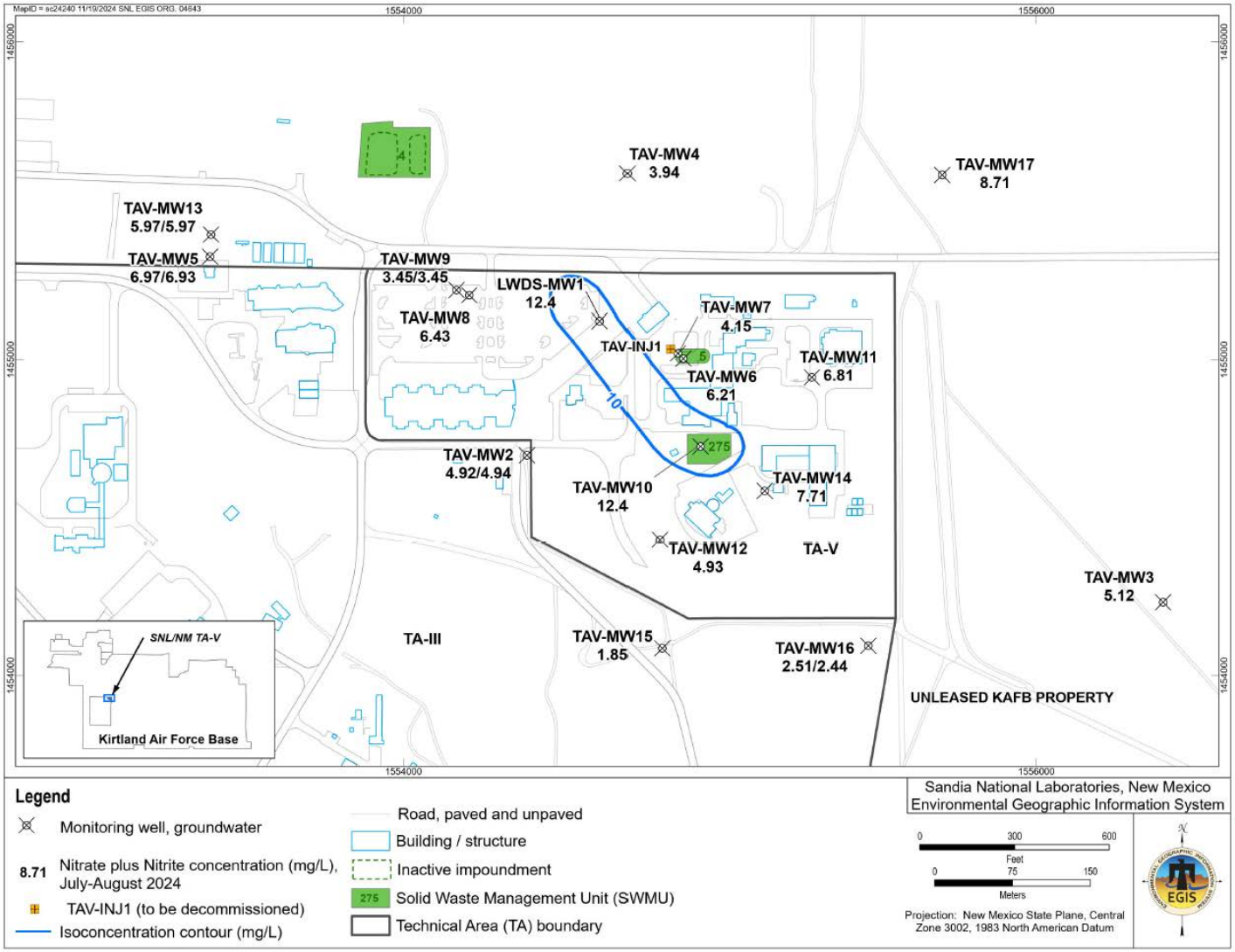


Figure 5-6
Distribution of Nitrate plus Nitrite in Groundwater in the Technical Area-V Groundwater Area of Concern, July/August 2024

The variability in hydraulic conductivities in saturated sediments has also likely influenced the distribution of contaminants in groundwater. The lowest hydraulic conductivity (0.04 ft/day) was measured at monitoring well LWDS-MW1, where historically the highest contaminant concentrations in groundwater were detected. It is possible that a localized low-conductivity zone near the water table at LWDS-MW1 has acted as a barrier for contaminant migration. As a reference, the hydraulic conductivities measured by slug tests at monitoring wells TAV-MW6 (SWMU 5) and TAV-MW10 (SWMU 275) were 1.14 and 4.12 ft/day, respectively.

Monitoring well TAV-MW17 was sampled for the first time in April 2023. Per the Consent Order, new monitoring wells must be sampled for perchlorate quarterly until they have four consecutive perchlorate results below the screening level of 4 µg/L. TAV-MW17 was sampled for perchlorate in the second, third, and fourth quarters of CY 2023 and in the first quarter of CY 2024.

Table 5B-4 presents the perchlorate result for monitoring well TAV-MW17. The perchlorate concentration was below the screening level of 4 µg/L in the January 2024 environmental sample. TAV-MW17 has therefore met the Consent Order perchlorate monitoring requirement of four consecutive perchlorate results below the screening level of 4 µg/L. No further perchlorate monitoring at TAV-MW17 is necessary.

5.6.2 Analytical Results for Waste Characterization Samples

The waste characterization samples (Table 5-5) were analyzed for major anions (bromide, chloride, fluoride, and sulfate), alkalinity, Target Analyte List (TAL) metals plus molybdenum (monitoring well TAV-MW17 only) and total uranium, gamma spectroscopy short list (americium-241, cesium-137, cobalt-60, and potassium-40), gross alpha/beta activity, and tritium.

Table 5B-5 presents the major anion and alkalinity results.

Table 5B-6 presents the TAL metals, molybdenum, and total uranium results.

Table 5B-7 presents the gamma spectroscopy short list, gross alpha/beta activity, and tritium results. Gross alpha activity was measured in accordance with 40 CFR Part 141 and used as a radiological screening tool. Naturally occurring uranium was measured independently (total uranium concentration determined by metals analysis described above), and the gross alpha activity measurements were corrected by subtracting the total uranium activity from the uncorrected gross alpha activity results. An SNL/NM health physicist reviewed the results to screen for radiological anomalies and to verify that levels were within acceptable limits.

5.6.3 Field Water Quality Parameter Measurements

Table 5B-8 presents the field water quality parameter measurements obtained at the end of purging and before sample collection (Chapter 1.0, Section 1.3.1.2) at each monitoring well during both sampling events. The field water quality parameters measured consisted of temperature, specific conductivity, oxidation-reduction potential, potential of hydrogen, turbidity, and dissolved oxygen. These parameters were measured to evaluate water chemistry stability and ensure the collection of representative groundwater samples. It is worth noting that the groundwater in the monitoring wells screened across the water table in TA-V is generally aerobic.

5.7 Quality Control Results

This section summarizes the CY 2024 field and laboratory QC sample results and their impact on data quality. Chapter 1.0, Section 1.3 describes how the field and laboratory QC samples were collected and prepared. Table 1-7 (Section 1.3.4) lists each field and laboratory QC sample type and purpose.

The field QC samples included environmental duplicate, equipment blank, field blank, and trip blank samples.

The laboratory QC samples included laboratory control, method blank, matrix spike and matrix spike duplicate, surrogate spike, and replicate samples. They were analyzed concurrently with the groundwater and field QC samples in accordance with laboratory procedures and EPA methods.

The environmental duplicate samples (Table 5-5) were analyzed for VOCs and NPN. Relative percent differences (RPDs) were calculated for the analytes detected in both the duplicate and original environmental samples. The sample pairs for both sampling events showed good agreement based on RPDs of 3 to 17 for TCE (less than the RPD goal of 20) and less than 1 to 8 for NPN (less than the RPD goal of 35).

The equipment blank samples were analyzed for all analytes (Table 5-5). The equipment blank sample results are as follows:

- January/February 2024 Sampling Event: Three equipment blank samples associated with monitoring wells LWDS-MW1, TAV-MW8, and TAV-MW11 were collected before sampling of the wells began. Bromodichloromethane, chloroform, dibromochloromethane, and methylene chloride were detected in the equipment blank samples. As a result, bromodichloromethane and dibromochloromethane in the LWDS-MW1 environmental and environmental duplicate samples were qualified during data validation as not detected. Methylene chloride in the equipment blank samples was qualified during data validation as not detected because the results were below the practical quantitation limit (PQL) in the equipment blank samples and associated method blank samples. No corrective action was necessary for chloroform because it has been historically detected at LWDS-MW1 and was not detected at TAV-MW8 or TAV-MW11.
- July/August 2024 Sampling Event: Five equipment blank samples associated with monitoring wells TAV-MW2, TAV-MW5, TAV-MW9, TAV-MW13, and TAV-MW16 were collected before sampling of the wells began. Acetone, alkalinity, bromodichloromethane, chloride, bromoform, chloroform, chloride, copper, dibromochloromethane, methylene chloride, sodium, sulfate, and toluene were detected in the equipment blank samples. As a result, copper in the TAV-MW9 waste characterization sample was qualified during data validation as not detected. Methylene chloride in the equipment blank samples was qualified during data validation as not detected because the results were below the PQL in the equipment blank samples and associated method blank samples. No corrective action was necessary for the other analytes because they were either not detected in the associated environmental or waste characterization samples or were detected in such samples at concentrations greater than five times the equipment blank sample result.

The field blank samples were analyzed for VOCs. The field blank sample results are as follows:

- January/February 2024 Sampling Event: Two field blank samples were collected at monitoring wells TAV-MW12 and TAV-MW14. Bromodichloromethane, chloroform, and dibromochloromethane were detected in the field blank samples. No corrective action was necessary because these analytes were not detected in the associated environmental samples. A third field blank sample was collected from the deionized water used for decontamination and equipment blank sample collection and was analyzed for all analytes (Table 5-5). The results were used to internally verify the quality of the deionized water but were not used during data validation to qualify environmental or field QC sample results.
- July/August 2024 Sampling Event: Three field blank samples were collected at monitoring wells TAV-MW2, TAV-MW12, and TAV-MW17. Acetone, bromodichloromethane, chloroform, dibromochloromethane, and methylene chloride were detected in the field blank samples. Methylene chloride in the field blank samples was qualified during data validation as not detected because the results were below the PQL in the field blank samples and associated method blank samples. No corrective action was necessary for the other analytes because they were not detected in the associated environmental samples. A fourth field blank sample was collected from the deionized water used for decontamination and equipment blank sample collection and was analyzed for all analytes (Table 5-5). The results were used to internally verify the quality of the deionized water but were not used during data validation to qualify environmental or field QC sample results.

The trip blank samples were analyzed for VOCs. The trip blank sample results are as follows:

- January/February 2024 Sampling Event: A total of 14 trip blank samples were submitted and analyzed. Only methylene chloride was detected. Methylene chloride in the trip blank samples was qualified during data validation as not detected because the results were below the PQL in the trip blank samples and associated method blank samples.
- July/August 2024 Sampling Event: A total of 23 trip blank samples were submitted and analyzed. Only methylene chloride was detected. Methylene chloride in 11 trip blank samples was qualified during data validation as not detected because the results were below the PQL in the trip blank samples and associated method blank samples.

The laboratory QC sample results led to the following qualifications of the environmental sample results:

- January/February 2024 Sampling Event: Methylene chloride was detected at concentrations below the PQL in the environmental, environmental duplicate, and associated method blank samples for 10 monitoring wells. As a result, methylene chloride in the environmental and environmental duplicate samples for the 10 monitoring wells was qualified during data validation as not detected.
- July/August 2024 Sampling Event: Methylene chloride was detected at concentrations below the PQL in the environmental, environmental duplicate, and associated method blank samples for seven monitoring wells. As a result, methylene chloride in the environmental and environmental duplicate samples for the seven monitoring wells was qualified during data validation as not detected. Additionally, the cesium-137 activity reported for monitoring well TAV-MW11 was rejected by the analytical laboratory due to the peak not meeting identification criteria.

5.8 Variances and Nonconformances

All CY 2024 TAVG AOC groundwater monitoring activities were performed and documented in accordance with the Consent Order and the CY 2024 Comprehensive Site-Wide Plan.

As explained in Section 5.6.1, monitoring well TAV-MW17 requires only semiannual sampling for compliance parameters and annual sampling for waste characterization parameters. This updates the statement in Section 3.0 of the CY 2024 Comprehensive Site-Wide Plan that says, "No changes to the TAVG AOC groundwater monitoring plan are proposed for CY 2024."

During the January/February 2024 sampling event, monitoring wells LWDS-MW1 and TAV-MW12 purged dry before the minimum purge volume was removed. They were allowed to recover and were sampled the following workday to ensure collection of the most representative groundwater samples possible given the low yields.

During the July/August 2024 sampling event, monitoring well LWDS-MW1 purged dry before the minimum purge volume was removed. It was allowed to recover and was sampled the following workday to ensure collection of the most representative groundwater samples possible given the low yield. Monitoring well TAV-MW5 was resampled for VOCs and NPN on August 1, 2024 because the original environmental samples collected on July 30, 2024 arrived at the analytical laboratory outside of temperature criteria. The resample VOC and NPN results are reported in Tables 5B-1 and 5B-3 (Attachment 5B), respectively.

5.9 Summary and Conclusions

The CSM for the TAVG AOC indicates that contaminant releases involving TCE occurred from two primary sources, SWMUs 5 and 275. TCE was present in wastewater that was disposed of at the underground LWDS Drain Field (SWMU 5) during the period of 1962 to 1967 and at the buried TA-V Seepage Pits (SWMU 275) from the 1960s to the early 1980s.

Wastewater devoid of TCE continued to flush through the vadose zone beneath the TA-V Seepage Pits (SWMU 275) until 1992, most likely removing a significant portion of a potential secondary contaminant source. Upon cessation of wastewater disposal, drainage diminished through vertical pathways in the vadose zone. The low concentrations of TCE present in the Regional Aquifer today represent the wastewater releases that occurred before 1992. Sanitary waste containing nitrate was also released at SWMU 275 from the 1960s to 1992. Wastewater containing nitrate migrated downward through the vadose zone and into the Regional Aquifer.

The combined effect of several wastewater release locations, various wastewater volumes, variable aquifer lithology, low groundwater flow velocities, dispersion, diffusion, and sorption is responsible for the current distribution of TCE and nitrate in the Regional Aquifer.

TCE concentrations in the environmental samples collected from five TAVG AOC monitoring wells (LWDS-MW1, TAV-MW4, TAV-MW6, TAV-MW8, and TAV-MW10) exceeded the EPA MCL of 5 µg/L in CY 2024. The maximum TCE concentration was 9.11 µg/L in the February 2024 TAV-MW10 environmental sample.

NPN concentrations in the environmental samples collected from two TAVG AOC monitoring wells (LWDS-MW1 and TAV-MW10) exceeded the EPA MCL of 10 mg/L in CY 2024. The maximum NPN concentration was 12.9 mg/L in the February 2024 TAV-MW10 environmental sample.

The CY 2024 analytical results are consistent with historical results. The following conclusions are based on a comprehensive review of historical and current groundwater contamination in the TAVG AOC:

- The COCs are TCE and nitrate.
- The primary sources of TCE and nitrate are two wastewater disposal systems: the LWDS Drain Field (SWMU 5) and the TA-V Seepage Pits (SWMU 275).
- Based on historical use and disposal of organic solvents in TA-V, the extent of TCE in the Regional Aquifer is attributed to wastewater releases containing TCE and the subsequent transport of TCE through the vadose zone to groundwater.
- The distribution of low TCE concentrations in the Regional Aquifer has remained relatively stable and is attributed to the combined effect of fine-grained aquifer lithology, low groundwater flow velocities, dispersion, diffusion, and sorption.
- The distribution of low nitrate concentrations is laterally widespread in the area, both inside and outside the TA-V boundary. The extent of the 10-mg/L NPN isoconcentration contour has remained relatively stable within the TA-V boundary. Elevated background may contribute to the nitrate concentrations at upgradient monitoring well TAV-MW17, located northeast of TA-V, and may not be associated with TA-V operations.

5.10 Summary of Future Activities

CY 2025 TAVG AOC groundwater monitoring activities will include:

- Quarterly water level measurements at active TAVG AOC monitoring wells.
- Semiannual collection and analysis of groundwater samples from active TAVG AOC monitoring wells.
- Annual reporting of the monitoring activities and results in the CY 2025 annual groundwater monitoring report.
- Plugging and abandonment of injection well TAV-INJ1.
- Submittal of the CY 2026 comprehensive site-wide groundwater monitoring plan to the NMED in April 2025.
- Support of the NMED review of the 2024 CCM/CME Report, if requested.

Attachment 5A
Historical Timeline of the Technical Area-V Groundwater Area of Concern

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Table 5A-1
Historical Timeline of the Technical Area-V Groundwater Area of Concern

Month	Year	Event	Reference
May	1959	Production well KAFB-10 was installed for fire suppression purposes. Water pumped occasionally for maintenance testing.	NMOSE, May 1959
	1961	Research buildings were constructed at TA-V.	DOE, September 1987
	1962	Discharge of wastewater to the vadose zone began.	DOE, September 1987
	1984	DOE created the CEARP to evaluate potential release sites at SNL/NM.	DOE, September 1987
	1988	The SNL/NM ER Project was created and began conducting investigations using the CEARP list of sites.	SNL/NM, March 1999a
	1992	Wastewater discharges to the vadose zone ceased after the ABCWUA sanitary sewer system was extended to TA-V.	SNL/NM, March 1999a
April	1992	The LWDS RFI Work Plan (SWMUs 4, 5, and 52) was submitted.	SNL/NM, March 1993
October	1992	Groundwater monitoring well LWDS-MW2 was installed at TA-V for the LWDS investigation.	SNL/NM, March 1993
May	1993	Groundwater monitoring well LWDS-MW1 was installed.	SNL/NM, September 1995
November	1993	LWDS-MW1 and LWDS-MW2 were sampled. The TCE concentration at LWDS-MW1 was 6 µg/L and exceeded the EPA MCL of 5 µg/L.	SNL/NM, March 1995
June	1994	Submitted notification letter from DOE to EPA regarding TCE concentration exceeding MCL in well LWDS-MW1.	DOE, June 1994
March	1995	Groundwater sample analytical results for monitoring wells LWDS-MW1 and LWDS-MW2 reported in the CY 1994 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, March 1995
February/March	1995	Wells TAV-MW1 and TAV-MW2 were installed.	SNL/NM, March 1996a
May/June	1995	Wells AVN-1 and AVN-2 were installed.	SNL/NM, March 1996b
	1995	The LWDS RFI Report was completed.	SNL/NM, September 1995
March	1996	Groundwater sampling analytical results for TAVG monitoring wells reported in the CY 1995 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, March 1996a
March	1996	Submitted letter to the NMED HWB with notification of elevated nitrate detection for well LWDS-MW1. The result was 10.1 mg/L, exceeding the EPA MCL of 10 mg/L.	DOE, March 1996
April	1996	KAFB-10 was plugged and abandoned due to the potential for the annulus of this production well to act as a conduit.	SNL/NM, April 1996
March	1997	Groundwater sampling analytical results for TAVG monitoring wells reported in the CY 1996 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, March 1997
April	1997	Wells TAV-MW3, TAV-MW4, and TAV-MW5 were installed.	SNL/NM, March 1999a
September	1997	NMED HWB issued an RSI stating that additional characterization was needed for each of the LWDS sites (SWMUs 4, 5, and 52).	NMED, September 1997
January	1998	RSI Response submitted to the NMED HWB.	SNL/NM, January 1998
March	1998	Groundwater sampling analytical results for TAVG monitoring wells reported in the CY 1997 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, March 1998
October	1998	Provided cross sections to the NMED HWB for the LWDS as required in the September 1997 RSI.	DOE, October 1998
March	1999	Submitted a summary report detailing groundwater conditions for the TA-III/V area that included sites from OU 1306 (TA-III) and OU 1307 (LWDS).	SNL/NM, March 1999a
March	1999	Groundwater sampling analytical results for TAVG monitoring wells reported in the FY 1998 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, March 1999b

See notes at end of table.

Table 5A-1 (continued)
Historical Timeline of the Technical Area-V Groundwater Area of Concern

Month	Year	Event	Reference
March	2000	Groundwater sampling analytical results for TAVG monitoring wells reported in the FY 1999 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, March 2000
March/April	2001	Wells TAV-MW6, TAV-MW7, TAV-MW8, and TAV-MW9 were installed.	SNL/NM, October 2001
April	2001	Groundwater sampling analytical results for TAVG monitoring wells reported in the FY 2000 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, April 2001
November	2001	A summary of groundwater sampling results from TAVG monitoring wells for FYs 1999 and 2000 were compiled into one report. This was an update of the SNL/NM, March 1999a summary report.	SNL/NM, November 2001
March	2002	Groundwater sampling analytical results for TAVG monitoring wells reported in the FY 2001 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, March 2002
March	2003	Groundwater sampling analytical results for TAVG monitoring wells reported in the FY 2002 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, March 2003
June	2003	Subsurface geology at KAFB, including the TAVG monitoring area, was updated.	Van Hart, June 2003
March	2004	Groundwater sampling analytical results for TAVG monitoring wells reported in the FY 2003 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, March 2004
April	2004	The NMED issued the Consent Order to DOE/Sandia, which identified the TAVG as an AOC with groundwater contamination requiring a CME.	NMED, April 2004
April	2004	Submitted the TA-V CCM.	SNL/NM, April 2004a
April	2004	Submitted the TA-V CME Work Plan.	SNL/NM, April 2004b
July	2004	The potential for natural (intrinsic) anaerobic biodegradation of TCE and nitrate in TA-V groundwater was evaluated.	SNL/NM, July 2005, Attachment D
October	2004	The NMED HWB approved the TA-V CCM without modification and approved the TA-V CME Work Plan with modification.	NMED, October 2004
December	2004	Submitted responses to the NMED HWB approval with modifications of the April 2004 TA-V CME Work Plan and a revised TA-V CME Work Plan.	SNL/NM, December 2004
April	2005	The potential for natural (intrinsic) aerobic biodegradation of TCE in TA-V groundwater was evaluated.	SNL/NM, July 2005, Attachment E
July	2005	Submitted the TA-V CME Report. The report details the selection of a preferred remedial alternative, cleanup goals, and a Corrective Measures Implementation Plan.	SNL/NM, July 2005
October	2005	Submitted request to the NMED HWB for change in sampling frequency for TAVG monitoring wells.	DOE, October 2005
October	2005	Groundwater sampling analytical results for TAVG monitoring wells reported in the FY 2004 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, October 2005
March	2006	Requested the removal of well AVN-2 from the TAVG monitoring network due to insufficient water for sampling caused by regional water level decline.	DOE, March 2006
November	2006	Groundwater sampling analytical results for TAVG monitoring wells reported in the FY 2005 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, November 2006

See notes at end of table.

Table 5A-1 (continued)
Historical Timeline of the Technical Area-V Groundwater Area of Concern

Month	Year	Event	Reference
March	2007	Groundwater sampling analytical results for TAVG monitoring wells reported in the FY 2006 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, March 2007
February	2008	Well TAV-MW1 plugged and abandoned. Well TAV-MW10 installed as replacement for TAV-MW1.	SNL/NM, June 2008
March	2008	Groundwater sampling analytical results for TAVG monitoring wells reported in the FY 2007 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, March 2008
July	2008	NMED HWB issued a NOD on the July 2005 CME Report for TAVG AOC.	NMED, July 2008
September	2008	The 13 TAVG monitoring wells were resurveyed to establish more accurate northing and easting coordinates and elevations for each well.	SNL/NM, October 2008
April	2009	NMED HWB required characterization of perchlorate in groundwater in one well (LWDS-MW1) at TA-V.	NMED, April 2009
April	2009	Submitted a response to the NOD on the July 2005 CME Report for TAVG AOC.	DOE, April 2009
June	2009	Groundwater sampling analytical results for TAVG monitoring wells reported in the CY 2008 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, June 2009
August	2009	NMED HWB issued a second NOD on the July 2005 CME Report for TAVG AOC.	NMED, August 2009
November	2009	Submitted a response to the second NOD on the July 2005 CME Report for TAVG AOC.	DOE, November 2009
December	2009	NMED HWB issued a third NOD on the July 2005 CME Report for TAVG AOC.	NMED, December 2009
February	2010	Submitted a response to the third NOD on the July 2005 CME Report for TAVG AOC.	DOE, February 2010
May	2010	NMED HWB issued a notice of conditional approval for the TA-V Groundwater Investigation Work Plan, Revision 2, which was part of the NOD responses.	NMED, May 2010
October	2010	Groundwater sampling analytical results for TAVG monitoring wells reported in the CY 2009 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, October 2010
November	2010	Completed installation of groundwater monitoring wells TAV-MW11, TAV-MW12, TAV-MW13, and TAV-MW14.	SNL/NM, June 2011
November	2010	Submitted a report to the NMED HWB for the geophysical logs and slug test results for the four newly installed TAVG monitoring wells.	DOE, November 2010
December	2010	NMED HWB issued approval for the modification of soil-vapor monitoring well design.	NMED, December 2010
March	2011	Completed installation of soil-vapor monitoring wells TAV-SV01, TAV-SV02, and TAV-SV03.	SNL/NM, June 2011
June	2011	Submitted a summary report for TA-V Groundwater and Soil-Vapor Monitoring Well Installation.	SNL/NM, June 2011
July	2011	DOE/NNSA and SNL/NM personnel met with the NMED HWB to discuss the results from the first quarter of groundwater and soil-vapor monitoring.	SNL/NM, July 2011
September	2011	Groundwater sampling analytical results for TAVG monitoring wells reported in the CY 2010 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, September 2011
June	2012	Groundwater sampling analytical results for TAVG monitoring wells reported in the CY 2011 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, June 2012

See notes at end of table.

Table 5A-1 (continued)
Historical Timeline of the Technical Area-V Groundwater Area of Concern

Month	Year	Event	Reference
June	2013	A study of denitrification parameters and isotopic signatures was conducted.	Madrid et al., June 2013
June	2013	Groundwater sampling analytical results for TAVG monitoring wells reported in the CY 2012 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, June 2013
September	2013	NMED HWB approved the summary report for TA-V Groundwater and Soil-Vapor Monitoring Well Installation.	NMED, September 2013
December	2013	Requested that the 2005 CME Report be withdrawn and replaced with an updated CCM and CME Report.	DOE, December 2013
December	2013	NMED HWB approved the extension request for an updated CCM and CME Report to be submitted by November 21, 2014.	NMED, December 2013
June	2014	Groundwater sampling analytical results for TAVG monitoring wells reported in the CY 2013 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, June 2014
September	2014	DOE Office of Environmental Management issued a memorandum to DOE/NNSA Sandia Field Office providing the IRR team's comments and recommendations on the corrective measures for TAVG AOC based on a multi-agency meeting including the NMED HWB on July 17, 2014.	DOE, September 2014
November	2014	DOE Office of Environmental Management issued a second IRR memorandum that had been submitted to the Deputy Assistant Secretary of the Office of Environmental Compliance regarding the IRR team's recommendations for TAVG AOC.	DOE, November 2014a
November	2014	Submitted a two-year extension request for the CCM and CME Report.	DOE, November 2014b
January	2015	NMED HWB approved the extension request for an updated CCM and CME Report. Due date revised to November 30, 2016.	NMED, January 2015b
May	2015	DOE Office of Environmental Management issued a third IRR memorandum that had been submitted to the Deputy Assistant Secretary of the Office of Environmental Compliance as their final recommendations for TAVG AOC.	DOE, May 2015
June	2015	Groundwater sampling analytical results for TAVG monitoring wells reported in the CY 2014 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, June 2015
October	2015	Submitted an updated CCM and a Treatability Study Work Plan (TSWP) for In Situ Bioremediation (ISB) at TAVG AOC. Two phases were proposed in the TSWP. One injection well would be installed and operated in Phase I. Dependent of the findings of Phase I, two more injection wells could be installed and operated in phase two.	SNL/NM, September 2015a,b DOE, October 2015
November	2015	NMED HWB approved the 2015 CCM for TAVG AOC.	NMED, November 2015
December	2015	NMED HWB disapproved the TSWP and requested a revised TSWP and a response letter that addressed the disapproval comments by January 29, 2016.	NMED, December 2015
January	2016	Requested a two-month extension for the revised TSWP and the response to the NMED HWB disapproval letter.	DOE, January 2016
January	2016	NMED HWB approved the extension request for submittal of comments response and the revised TSWP. The new due date was March 31, 2016.	NMED, January 2016

See notes at end of table.

Table 5A-1 (continued)
Historical Timeline of the Technical Area-V Groundwater Area of Concern

Month	Year	Event	Reference
March	2016	Submitted the revised TSWP and the response to the NMED HWB disapproval letter.	SNL/NM, March 2016 DOE, March 2016a
March	2016	Submitted a summary of agreements and proposed schedule milestones pursuant to a multi-agency meeting including the NMED HWB on July 20, 2015. Requested an extension to update the CCM and CME Report.	DOE, March 2016b
April	2016	NMED HWB approved the extension of milestones and stated the new due date for the updated CCM and CME Report for TAVG AOC was May 20, 2022.	NMED, April 2016
May	2016	NMED HWB approved the Revised TSWP.	NMED, May 2016a
May	2016	Submitted the Notice of Intent to Discharge to the NMED GWQB for the ISB Treatability Study injection wells.	DOE, May 2016
May	2016	NMED HWB stated the report for geophysical logs and slug test results (DOE, November 2010) will be superseded by the updated CCM and CME Report.	NMED, May 2016b
June	2016	NMED GWQB stated that a Discharge Permit would be required for the ISB Treatability Study injection wells.	NMED, June 2016
June	2016	Groundwater sampling analytical results for TAVG monitoring wells reported in the CY 2015 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, June 2016
July	2016	Submitted the Discharge Permit Application for the ISB Treatability Study injection wells.	DOE, July 2016a
July	2016	Submitted the Permit to Drill applications to NMOSE for installing two groundwater monitoring wells, TAV-MW15 and TAV-MW16, and one injection well TAV-INJ1.	DOE, July 2016b
August	2016	NMOSE approved the Permit to Drill applications for wells TAV-MW15, TAV-MW16, and TAV-INJ1.	NMOSE, August 2016
September	2016	NMED GWQB determined the Discharge Permit Application was administratively complete.	NMED, September 2016
November	2016	Completed the public notice requirements for the Discharge Permit Application.	DOE, November 2016
January	2017	Completed installation and development of monitoring wells TAV-MW15 and TAV-MW16.	SNL/NM, May 2017a
January	2017	Completed the redevelopment of monitoring wells AVN-1, LWDS-MW2, TAV-MW2, TAV-MW9, TAV-MW11, and TAV-MW12.	SNL/NM, May 2017b
February	2017	Started to implement the new sampling requirements per the NMED HWB-approved Revised TSWP.	DOE, March 2016a NMED, May 2016a
May	2017	NMED GWQB issued Discharge Permit, DP-1845.	NMED, May 2017
June	2017	Groundwater sampling analytical results for TAVG monitoring wells reported in the CY 2016 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, June 2017
May/July	2017	Well installation report for monitoring wells TAV-MW15 and TAV-MW16 was submitted to the NMED HWB.	SNL/NM, May 2017a DOE, July 2017
August	2017	NMED HWB approved the well installation report for monitoring wells TAV-MW15 and TAV-MW16.	NMED, August 2017
November	2017	Installed injection well TAV-INJ1 for Phase I of the ISB Treatability Study.	SNL/NM, June 2018a
November	2017	Notification to the NMED GWQB to commence discharge under DP-1845. Pilot Test for Phase I of the ISB Treatability Study was conducted. Approximately 9,000 gallons of treatment solution was discharged at injection well TAV-INJ1.	DOE, November 2017

See notes at end of table.

Table 5A-1 (continued)
Historical Timeline of the Technical Area-V Groundwater Area of Concern

Month	Year	Event	Reference
June	2018	Groundwater sampling analytical results for TAVG monitoring wells reported in the CY 2017 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, June 2018b
July	2018	Notification to the NMED HWB to proceed to full-scale operation at injection well TAV-INJ1 with modifications.	DOE, July 2018
August	2018	NMED HWB approved the modifications and concurred with the decision to proceed to full-scale operation at injection well TAV-INJ1.	NMED, August 2018
October	2018	Submitted the summary of the ISB Treatability Study Pilot Test operation and results.	SNL/NM, October 2018
October	2018	Full-scale operation for the Phase I ISB Treatability Study started at injection well TAV-INJ1.	SNL/NM, April 2019
April	2019	Completed six-month injections at well TAV-INJ1. Approximately 530,000 gallons of treatment solution was discharged via TAV-INJ1.	SNL/NM, October 2019
May	2019	Started two-year performance monitoring of the Phase I ISB Treatability Study.	SNL/NM, October 2019
June	2019	Groundwater sampling analytical results for TAVG monitoring wells reported in the CY 2018 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, June 2019
September	2019	NMED HWB requested a minimum of two sampling events to be conducted for 1,4-dioxane at TAVG AOC.	NMED, September 2019
June	2020	Groundwater sampling analytical results for TAVG monitoring wells reported in the CY 2019 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, June 2020
May/June	2021	Completed two sampling events for 1,4-dioxane at all groundwater wells at TAVG AOC.	SNL/NM, June 2022
June	2021	Groundwater sampling analytical results for TAVG monitoring wells reported in the CY 2020 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, June 2021
August	2021	Submitted request to the NMED HWB for transition of five groundwater wells under the NMED GWQB to the NMED HWB as condition to terminate DP-1845.	DOE, August 2021
August/ September	2021	Submitted the Work Plan to plug and abandon wells AVN-1, AVN-2, and LWDS-MW2, and install a new groundwater well (TAV-MW17).	SNL/NM, August 2021 DOE, September 2021
October	2021	NMED HWB approved the transition of five groundwater wells from the NMED GWQB to the NMED HWB.	NMED, October 2021a
October	2021	NMED HWB approved the Work Plan (with modification) to plug and abandon monitoring wells AVN-1, AVN-2, and LWDS-MW2, and install new monitoring well TAV-MW17.	NMED, October 2021b
November	2021	NMED GWQB agreed with the transition of five groundwater wells to the NMED HWB.	NMED, November 2021
November	2021	Submitted request to the NMED GWQB to terminate DP-1845.	DOE, November 2021
February	2022	NMED GWQB terminated DP-1845.	NMED, February 2022
March/April	2022	Submitted the Phase I Treatability Study Report to the NMED HWB.	SNL/NM, March 2022 DOE, April 2022a
April	2022	Requested an extension for submittal of the TAVG AOC CCM and CME Report, which was due to the NMED HWB by May 20, 2022.	DOE, April 2022b
April	2022	Submitted the application for Permit to Drill a well with no water right for TAV-MW17 and the Well Plugging Plan of Operations for AVN-1, AVN-2, and LWDS-MW2 to the NMOSE.	DOE, April 2022c

See notes at end of table.

Table 5A-1 (continued)
Historical Timeline of the Technical Area-V Groundwater Area of Concern

May	2022	NMOSE approved the Permit to Drill for TAV-MW17 and the Plugging Plan of Operations for AVN-1, AVN-2, and LWDS-MW2.	NMOSE, May 2022
May	2022	NMED HWB approved the extension request for the TAVG AOC CCM and CME Report.	NMED, May 2022
June	2022	Groundwater sampling analytical results for TAVG monitoring wells reported in the CY 2021 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, June 2022
June	2022	NMED HWB approved the Phase I Treatability Study Report.	NMED, June 2022
July	2022	Submitted request to decommission well TAV-INJ1 and revert monitoring well TAV-MW6 to follow the requirements of the TAVG monitoring network.	DOE, July 2022
August	2022	Submitted request to modify the sampling plan of the TAVG monitoring network.	DOE, August 2022
September	2022	NMED HWB approved the request to decommission well TAV-INJ1 and revert monitoring well TAV-MW6 to follow the requirements of the TAVG monitoring network.	NMED, September 2022
December	2022	NMED HWB approved the request to modify the sampling plan of the TAVG monitoring network.	NMED, December 2022
January	2023	NMED HWB requested a comprehensive site-wide groundwater monitoring plan to be submitted by April 30 annually.	NMED, January 2023
January/ February	2023	Submitted the work plan to decommission injection well TAV-INJ1.	SNL/NM, January 2023 DOE, February 2023
February	2023	Plugged and abandoned three existing monitoring wells AVN-1, AVN-2, and LWDS-MW2 and installed new monitoring well TAV-MW17.	SNL/NM, July 2023a
March	2023	NMED HWB approved the work plan to decommission injection well TAV-INJ1.	NMED, March 2023
April	2023	Submitted the *Comprehensive Site-Wide Groundwater Monitoring Plan, Calendar Year 2024* to the NMED HWB.	SNL/NM, April 2023a DOE, April 2023
June	2023	Groundwater sampling analytical results for TAVG monitoring wells reported in the CY 2022 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, June 2023
July	2023	NMED HWB issued approval with modification on the *Comprehensive Site-Wide Groundwater Monitoring Plan, Calendar Year 2024.*	NMED, July 2023
July/August	2023	Submitted TAV-MW17 installation and AVN-1, AVN-2, and LWDS-MW2 decommissioning report.	SNL/NM, July 2023a DOE, August 2023
September	2023	Submitted the *Comprehensive Site-Wide Groundwater Monitoring Plan (Revised), Calendar Year 2024.*	SNL/NM, April 2023b DOE, September 2023
October	2023	NMED HWB issued approval with modification on the TAV-MW17 installation and AVN-1, AVN-2, and LWDS-MW2 decommissioning report.	NMED, October 2023a
October	2023	NMED HWB issued approval on the *Comprehensive Site-Wide Groundwater Monitoring Plan (Revised), Calendar Year 2024.*	NMED, October 2023b
January	2024	Submitted the revised TAV-MW17 installation and AVN-1, AVN-2, and LWDS-MW2 decommissioning report.	SNL/NM, July 2023b DOE, January 2024
March	2024	NMED HWB issued approval on the revised TAV-MW17 installation and AVN-1, AVN-2, and LWDS-MW2 decommissioning report.	NMED, March 2024
April	2024	Submitted the *Comprehensive Site-Wide Groundwater Monitoring Plan, Calendar Year 2025* to the NMED HWB.	SNL/NM, April 2024 DOE, April 2024a

See notes at end of table.

Table 5A-1 (concluded)
Historical Timeline of the Technical Area-V Groundwater Area of Concern

April/May	2024	Submitted the TAVG AOC CCM and CME Report to the NMED HWB.	DOE, April 2024b SNL/NM, May 2024
July	2024	NMED HWB issued approval on the *Comprehensive Site-Wide Groundwater Monitoring Plan, Calendar Year 2025*.	NMED, July 2024
July	2024	Groundwater sampling analytical results for TAVG monitoring wells reported in the CY 2023 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, July 2024
October	2024	Submitted the Well Plugging Plan of Operations for TAV-INJ1 to the NMOSE.	DOE, October 2024
November	2024	Received approval from the NMOSE to plug and abandon TAV-INJ1.	NMOSE, November 2024

Notes:

ABCWUA = Albuquerque Bernalillo County Water Utility Authority
AOC = Area of Concern
AVN = Area-V (North)
CEARP = Comprehensive Environmental Assessment and Response Program
CCM = Current Conceptual Model
CME = Corrective Measures Evaluation
CY = calendar year
DP = Discharge Permit
DOE = U.S. Department of Energy
EPA = U.S. Environmental Protection Agency
ER = Environmental Restoration
FY = fiscal year
GWQB = Ground Water Quality Bureau
HWB = Hazardous Waste Bureau
INJ = Injection Well
IRR = Internal Remedy Review
KAFB = Kirtland Air Force Base
LWDS = Liquid Waste Disposal System
MCL = maximum contaminant level
µg/L = microgram(s) per liter
mg/L = milligram(s) per liter
MW = Monitoring Well
NMED = New Mexico Environment Department
NMOSE = New Mexico Office of the State Engineer
NNSA = National Nuclear Security Administration
NOD = Notice of Disapproval
OU = Operable Unit
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
RSI = Request for Supplemental Information
Sandia = Sandia Corporation
SNL/NM = Sandia National Laboratories, New Mexico
SWMU = Solid Waste Management Unit
TA = Technical Area
TAV = Technical Area-V (well identification only)
TAVG = Technical Area-V Groundwater
TCE = trichloroethene

Attachment 5B
Technical Area-V Groundwater Area of Concern
Analytical Results Tables

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Attachment 5B Tables

Table 5B-1 Summary of Detected Volatile Organic Compounds for Environmental Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 5B-5

Table 5B-2 Method Detection Limits for Volatile Organic Compounds (EPA Method[g] SW846-8260B and SW846-8260D), Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 5B-8

Table 5B-3 Summary of Nitrate plus Nitrite Results for Environmental Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 5B-9

Table 5B-4 Summary of Perchlorate Results for Environmental Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 5B-12

Table 5B-5 Summary of Major Anion and Alkalinity Results for Waste Characterization Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 5B-13

Table 5B-6 Summary of TAL Metals plus Total Uranium Results for Waste Characterization Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 5B-16

Table 5B-7 Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, and Tritium Results for Waste Characterization Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 5B-34

Table 5B-8 Summary of Field Water Quality Parameter Measurements, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 5B-38

Notes for Technical Area-V Groundwater Area of Concern Analytical Results Tables 5B-39

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Table 5B-1
Summary of Detected Volatile Organic Compounds for Environmental Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (µg/L)	MDL[b] (µg/L)	PQL[c] (µg/L)	MCL[d] (µg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
LWDS-MW1	Bromodichloromethane	1.22	0.330	1.00	80.0		1.22U	121754-001	SW846-8260D
12-Feb-24	Chloroform	2.65	0.330	1.00	80.0		J	121754-001	SW846-8260D
	Dibromochloromethane	0.770	0.330	1.00	80.0	J	1.00U	121754-001	SW846-8260D
	Methylene chloride	2.07	0.500	5.00	5.00	B, J	5.00UJ	121754-001	SW846-8260D
	Toluene	0.470	0.330	1.00	1000	J		121754-001	SW846-8260D
	Trichloroethene	**5.58**	0.330	1.00	5.00			121754-001	SW846-8260D
	cis-1,2-Dichloroethene	1.79	0.330	1.00	70.0			121754-001	SW846-8260D
LWDS-MW1 (Duplicate)	Bromodichloromethane	0.730	0.330	1.00	80.0	J	1.00U	121755-001	SW846-8260D
12-Feb-24	Chloroform	1.71	0.330	1.00	80.0		J	121755-001	SW846-8260D
	Dibromochloromethane	0.540	0.330	1.00	80.0	J	1.00U	121755-001	SW846-8260D
	Methylene chloride	2.08	0.500	5.00	5.00	B, J	5.00UJ	121755-001	SW846-8260D
	Toluene	0.460	0.330	1.00	1000	J		121755-001	SW846-8260D
	Trichloroethene	**6.60**	0.330	1.00	5.00			121755-001	SW846-8260D
	cis-1,2-Dichloroethene	2.24	0.330	1.00	70.0			121755-001	SW846-8260D
TAV-MW2	Methylene chloride	1.43	0.500	5.00	5.00	B, J	5.00UJ	121731-001	SW846-8260D
01-Feb-24	Trichloroethene	2.59	0.333	1.00	5.00			121731-001	SW846-8260D
TAV-MW4	Chloroform	0.970	0.333	1.00	80.0	J		121748-001	SW846-8260D
07-Feb-24	Methylene chloride	1.46	0.500	5.00	5.00	B, J	5.00UJ	121748-001	SW846-8260D
	Trichloroethene	**5.70**	0.333	1.00	5.00			121748-001	SW846-8260D
	cis-1,2-Dichloroethene	0.520	0.333	1.00	70.0	J		121748-001	SW846-8260D
TAV-MW6	Methylene chloride	1.41	0.500	5.00	5.00	B, J	5.00UJ	121750-001	SW846-8260D
08-Feb-24	Trichloroethene	**7.64**	0.333	1.00	5.00			121750-001	SW846-8260D
	cis-1,2-Dichloroethene	0.810	0.333	1.00	70.0	J		121750-001	SW846-8260D
TAV-MW8	Methylene chloride	1.34	0.500	5.00	5.00	B, J	5.00UJ	121743-001	SW846-8260D
06-Feb-24	Trichloroethene	4.09	0.333	1.00	5.00			121743-001	SW846-8260D
	cis-1,2-Dichloroethene	0.420	0.333	1.00	70.0	J		121743-001	SW846-8260D
TAV-MW8 (Duplicate)	Methylene chloride	1.68	0.500	5.00	5.00	B, J	5.00UJ	121744-001	SW846-8260D
06-Feb-24	Trichloroethene	3.51	0.333	1.00	5.00			121744-001	SW846-8260D
	cis-1,2-Dichloroethene	0.370	0.333	1.00	70.0	J		121744-001	SW846-8260D
TAV-MW10	Methylene chloride	2.27	0.500	5.00	5.00	B, J	5.00UJ	121757-001	SW846-8260D
13-Feb-24	Trichloroethene	**9.11**	0.333	1.00	5.00			121757-001	SW846-8260D
	cis-1,2-Dichloroethene	1.62	0.333	1.00	70.0			121757-001	SW846-8260D
TAV-MW11	Methylene chloride	1.88	0.500	5.00	5.00	B, J	5.00UJ	121735-001	SW846-8260D
02-Feb-24	Trichloroethene	3.94	0.333	1.00	5.00			121735-001	SW846-8260D
	cis-1,2-Dichloroethene	0.500	0.333	1.00	70.0	J		121735-001	SW846-8260D

See notes at end of tables.

Table 5B-1 (continued)
Summary of Detected Volatile Organic Compounds for Environmental Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (µg/L)	MDL[b] (µg/L)	PQL[c] (µg/L)	MCL[d] (µg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW11 (Duplicate) 02-Feb-24	Methylene chloride	4.33	0.500	5.00	5.00	B, J	5.00UJ	121736-001	SW846-8260D
	Trichloroethene	3.84	0.333	1.00	5.00			121736-001	SW846-8260D
	cis-1,2-Dichloroethene	0.520	0.333	1.00	70.0	J		121736-001	SW846-8260D
TAV-MW12 31-Jan-24	Methylene chloride	1.34	0.500	5.00	5.00	B, J	5.00UJ	121729-001	SW846-8260D
	Trichloroethene	1.83	0.333	1.00	5.00			121729-001	SW846-8260D
TAV-MW14 05-Feb-24	Trichloroethene	4.04	0.333	1.00	5.00			121739-001	SW846-8260D
	cis-1,2-Dichloroethene	0.360	0.333	1.00	70.0	J		121739-001	SW846-8260D
TAV-MW16 26-Jan-24	Methylene chloride	1.67	0.500	5.00	5.00	B, J	5.00UJ	121759-001	SW846-8260D
	Trichloroethene	0.460	0.333	1.00	5.00	J		121759-001	SW846-8260D
TAV-MW17 29-Jan-24	Methylene chloride	1.91	0.500	5.00	5.00	B, J	5.00UJ	121726-001	SW846-8260D
LWDS-MW1 19-Aug-24	Chloroform	2.23	0.330	1.00	80.0			122857-001	SW846-8260D
	Toluene	0.690	0.330	1.00	1000	J		122857-001	SW846-8260D
	Trichloroethene	**6.11**	0.330	1.00	5.00			122857-001	SW846-8260D
	cis-1,2-Dichloroethene	2.06	0.330	1.00	70.0			122857-001	SW846-8260D
TAV-MW2 06-Aug-24	Methylene chloride	0.550	0.500	5.00	5.00	B, J	5.00UJ	122839-001	SW846-8260D
	Trichloroethene	2.33	0.333	1.00	5.00			122839-001	SW846-8260D
TAV-MW2 (Duplicate) 06-Aug-24	Methylene chloride	0.520	0.500	5.00	5.00	B, J	5.00UJ	122840-001	SW846-8260D
	Trichloroethene	2.20	0.333	1.00	5.00			122840-001	SW846-8260D
TAV-MW4 13-Aug-24	Chloroform	1.09	0.333	1.00	80.0			122851-001	SW846-8260D
	Methylene chloride	0.810	0.500	5.00	5.00	B, J	5.00UJ	122851-001	SW846-8260D
	Trichloroethene	**6.31**	0.333	1.00	5.00			122851-001	SW846-8260D
	cis-1,2-Dichloroethene	0.660	0.333	1.00	70.0	J		122851-001	SW846-8260D
TAV-MW5 (Duplicate) 01-Aug-24	Methylene chloride	0.680	0.500	5.00	5.00	J, N	J-	122922-001	SW846-8260D
TAV-MW6 14-Aug-24	Methylene chloride	0.830	0.500	5.00	5.00	B, J	5.00UJ	122855-001	SW846-8260D
	Trichloroethene	**7.86**	0.333	1.00	5.00			122855-001	SW846-8260D
	cis-1,2-Dichloroethene	0.890	0.333	1.00	70.0	J		122855-001	SW846-8260D
TAV-MW7 25-Jul-24	Methylene chloride	1.17	0.500	5.00	5.00	B, J	5.00UJ	122807-001	SW846-8260D
TAV-MW8 12-Aug-24	Trichloroethene	**5.11**	0.333	1.00	5.00			122849-001	SW846-8260D
	cis-1,2-Dichloroethene	0.520	0.333	1.00	70.0	J		122849-001	SW846-8260D
TAV-MW9 24-Jul-24	Methylene chloride	1.43	0.500	5.00	5.00	B, J	5.00UJ	122804-001	SW846-8260D
TAV-MW9 (Duplicate) 24-Jul-24	Methylene chloride	1.35	0.500	5.00	5.00	B, J	5.00UJ	122805-001	SW846-8260D

See notes at end of tables.

Table 5B-1 (concluded)
Summary of Detected Volatile Organic Compounds for Environmental Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (µg/L)	MDL[b] (µg/L)	PQL[c] (µg/L)	MCL[d] (µg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW10 15-Aug-24	Trichloroethene	**8.82**	0.333	1.00	5.00			122859-001	SW846-8260D
	cis-1,2-Dichloroethene	1.62	0.333	1.00	70.0			122859-001	SW846-8260D
TAV-MW11 08-Aug-24	Trichloroethene	4.65	0.333	1.00	5.00			122845-001	SW846-8260D
	cis-1,2-Dichloroethene	0.520	0.333	1.00	70.0	J		122845-001	SW846-8260D
TAV-MW12 07-Aug-24	Trichloroethene	1.60	0.333	1.00	5.00			122843-001	SW846-8260D
TAV-MW14 09-Aug-24	Trichloroethene	4.21	0.333	1.00	5.00			122847-001	SW846-8260D
	cis-1,2-Dichloroethene	0.380	0.333	1.00	70.0	J		122847-001	SW846-8260D
TAV-MW15 23-Jul-24	Methylene chloride	1.55	0.500	5.00	5.00	B, J	5.00UJ	122800-001	SW846-8260D
TAV-MW16 (Duplicate) 31-Jul-24	Trichloroethene	0.380	0.333	1.00	5.00	J		122824-001	SW846-8260D
TAV-MW17 02-Aug-24	Methylene chloride	1.24	0.500	5.00	5.00	J, N	5.00UJ	122827-001	SW846-8260D

See notes at end of tables.

Table 5B-2
Method Detection Limits for Volatile Organic Compounds (EPA Method[g] SW846-8260B and SW846-8260D), Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Analyte	MDL[b] (µg/L)	Analyte	MDL[b] (µg/L)
1,1,1-Trichloroethane	0.333	Chlorobenzene	0.333
1,1,2,2-Tetrachloroethane	0.333	Chloroethane	0.333
1,1,2-Trichloroethane	0.333	Chloroform	0.333
1,1-Dichloroethane	0.333	Chloromethane	0.333
1,1-Dichloroethene	0.333	Cyclohexane	0.333
1,2,3-Trichlorobenzene	0.333	Dibromochloromethane	0.333
1,2,4-Trichlorobenzene	0.333	Dichlorodifluoromethane	0.355
1,2-Dibromo-3-chloropropane	0.333	Ethylbenzene	0.333
1,2-Dibromoethane	0.333	Isopropylbenzene	0.333
1,2-Dichlorobenzene	0.333	Methyl acetate	1.67
1,2-Dichloroethane	0.333	Methylcyclohexane	0.333
1,2-Dichloropropane	0.333	Methylene chloride	0.500
1,3-Dichlorobenzene	0.333	Styrene	0.333
1,4-Dichlorobenzene	0.333	Tert-butyl methyl ether	0.333
2,2-trifluoroethane, 1,1,2-Trichloro-1	1.67 - 2.98	Tetrachloroethene	0.333
2-Butanone	1.67	Toluene	0.333
2-Hexanone	1.67	Trichloroethene	0.333
4-methyl-, 2-Pentanone	1.67	Trichlorofluoromethane	0.333
Acetone	1.74	Vinyl chloride	0.333
Benzene	0.333	Xylene	1.00
Bromochloromethane	0.333	cis-1,2-Dichloroethene	0.333
Bromodichloromethane	0.333	cis-1,3-Dichloropropene	0.333
Bromoform	0.333	m-, p-Xylene	0.500
Bromomethane	0.337	o-Xylene	0.333
Carbon disulfide	1.67	trans-1,2-Dichloroethene	0.333
Carbon tetrachloride	0.333	trans-1,3-Dichloropropene	0.333

See notes at end of tables.

Table 5B-3
Summary of Nitrate plus Nitrite Results for Environmental Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL[d] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
LWDS-MW1 12-Feb-24	Nitrate plus nitrite	**12.0**	0.850	2.50	10.0			121754-002	EPA 353.2
LWDS-MW1 (Duplicate) 12-Feb-24	Nitrate plus nitrite	**12.0**	0.850	2.50	10.0			121755-002	EPA 353.2
TAV-MW2 01-Feb-24	Nitrate plus nitrite	5.39	0.170	0.500	10.0			121731-002	EPA 353.2
TAV-MW4 07-Feb-24	Nitrate plus nitrite	4.04	0.0850	0.250	10.0			121748-002	EPA 353.2
TAV-MW6 08-Feb-24	Nitrate plus nitrite	5.95	0.0850	0.250	10.0			121750-002	EPA 353.2
TAV-MW8 06-Feb-24	Nitrate plus nitrite	6.75	0.0850	0.250	10.0			121743-002	EPA 353.2
TAV-MW8 (Duplicate) 06-Feb-24	Nitrate plus nitrite	6.25	0.0850	0.250	10.0			121744-002	EPA 353.2
TAV-MW10 13-Feb-24	Nitrate plus nitrite	**12.9**	0.850	2.50	10.0			121757-002	EPA 353.2
TAV-MW11 02-Feb-24	Nitrate plus nitrite	6.60	0.0850	0.250	10.0			121735-002	EPA 353.2
TAV-MW11 (Duplicate) 02-Feb-24	Nitrate plus nitrite	6.70	0.0850	0.250	10.0			121736-002	EPA 353.2
TAV-MW12 31-Jan-24	Nitrate plus nitrite	4.93	0.170	0.500	10.0			121729-002	EPA 353.2
TAV-MW14 05-Feb-24	Nitrate plus nitrite	7.53	0.170	0.500	10.0			121739-002	EPA 353.2
TAV-MW16 26-Jan-24	Nitrate plus nitrite	2.44	0.0850	0.250	10.0			121759-002	EPA 353.2
TAV-MW17 29-Jan-24	Nitrate plus nitrite	8.73	0.170	0.500	10.0			121726-002	EPA 353.2
LWDS-MW1 19-Aug-24	Nitrate plus nitrite	**12.4**	0.170	0.500	10.0			122857-002	EPA 353.2
TAV-MW2 06-Aug-24	Nitrate plus nitrite	4.92	0.170	0.500	10.0			122839-002	EPA 353.2
TAV-MW2 (Duplicate) 06-Aug-24	Nitrate plus nitrite	4.94	0.170	0.500	10.0			122840-002	EPA 353.2

See notes at end of tables.

Table 5B-3 (continued)
Summary of Nitrate plus Nitrite Results for Environmental Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL[d] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW3 26-Jul-24	Nitrate plus nitrite	5.12	0.170	0.500	10.0			122809-002	EPA 353.2
TAV-MW4 13-Aug-24	Nitrate plus nitrite	3.94	0.170	0.500	10.0			122851-002	EPA 353.2
TAV-MW5 01-Aug-24	Nitrate plus nitrite	6.97	0.170	0.500	10.0			122921-002	EPA 353.2
TAV-MW5 (Duplicate) 01-Aug-24	Nitrate plus nitrite	6.93	0.170	0.500	10.0			122922-002	EPA 353.2
TAV-MW6 14-Aug-24	Nitrate plus nitrite	6.21	0.170	0.500	10.0			122855-002	EPA 353.2
TAV-MW7 25-Jul-24	Nitrate plus nitrite	4.15	0.170	0.500	10.0			122807-002	EPA 353.2
TAV-MW8 12-Aug-24	Nitrate plus nitrite	6.43	0.170	0.500	10.0			122849-002	EPA 353.2
TAV-MW9 24-Jul-24	Nitrate plus nitrite	3.45	0.170	0.500	10.0			122804-002	EPA 353.2
TAV-MW9 (Duplicate) 24-Jul-24	Nitrate plus nitrite	3.45	0.170	0.500	10.0			122805-002	EPA 353.2
TAV-MW10 15-Aug-24	Nitrate plus nitrite	**12.4**	0.850	2.50	10.0			122859-002	EPA 353.2
TAV-MW11 08-Aug-24	Nitrate plus nitrite	6.81	0.170	0.500	10.0			122845-002	EPA 353.2
TAV-MW12 07-Aug-24	Nitrate plus nitrite	4.93	0.170	0.500	10.0			122843-002	EPA 353.2
TAV-MW13 29-Jul-24	Nitrate plus nitrite	5.97	0.170	0.500	10.0			122813-002	EPA 353.2
TAV-MW13 (Duplicate) 29-Jul-24	Nitrate plus nitrite	5.97	0.170	0.500	10.0			122814-002	EPA 353.2
TAV-MW14 09-Aug-24	Nitrate plus nitrite	7.71	0.170	0.500	10.0			122847-002	EPA 353.2
TAV-MW15 23-Jul-24	Nitrate plus nitrite	1.85	0.0850	0.250	10.0			122800-002	EPA 353.2

See notes at end of tables.

Table 5B-3 (concluded)
Summary of Nitrate plus Nitrite Results for Environmental Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL[d] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW16 31-Jul-24	Nitrate plus nitrite	2.51	0.170	0.500	10.0			122823-002	EPA 353.2
TAV-MW16 (Duplicate) 31-Jul-24	Nitrate plus nitrite	2.44	0.170	0.500	10.0			122824-002	EPA 353.2
TAV-MW17 02-Aug-24	Nitrate plus nitrite	8.71	0.170	0.500	10.0			122827-002	EPA 353.2

See notes at end of tables.

Table 5B-4
Summary of Perchlorate Results for Environmental Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL[d] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW17 29-Jan-24	Perchlorate	0.000826	0.0000500	0.00400	NE			121726-003	SW846-6850M

See notes at end of tables.

Table 5B-5
Summary of Major Anion and Alkalinity Results for Waste Characterization Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW17 29-Jan-24	Bromide	0.225	0.0670	0.200			121726-004	SW846-9056A
	Chloride	15.6	0.268	0.800	B		121726-004	SW846-9056A
	Fluoride	1.28	0.0330	0.100			121726-004	SW846-9056A
	Sulfate	27.8	0.532	1.60			121726-004	SW846-9056A
	Bicarbonate Alkalinity	158	0.725	2.00			121726-005	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		121726-005	SM 2320B
LWDS-MW1 19-Aug-24	Bromide	0.921	0.0670	0.200			122857-003	SW846-9056A
	Chloride	75.7	1.34	4.00	B		122857-003	SW846-9056A
	Fluoride	0.685	0.0330	0.100			122857-003	SW846-9056A
	Sulfate	33.8	0.665	2.00			122857-003	SW846-9056A
	Bicarbonate Alkalinity	195	0.725	2.00			122857-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122857-004	SM 2320B
TAV-MW2 06-Aug-24	Bromide	0.357	0.0670	0.200			122839-003	SW846-9056A
	Chloride	55.1	0.670	2.00			122839-003	SW846-9056A
	Fluoride	1.12	0.0330	0.100			122839-003	SW846-9056A
	Sulfate	59.7	1.33	4.00			122839-003	SW846-9056A
	Bicarbonate Alkalinity	252	0.725	2.00			122839-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122839-004	SM 2320B
TAV-MW3 26-Jul-24	Bromide	0.254	0.0670	0.200			122809-003	SW846-9056A
	Chloride	29.3	0.335	1.00			122809-003	SW846-9056A
	Fluoride	1.49	0.0330	0.100			122809-003	SW846-9056A
	Sulfate	64.8	0.665	2.00			122809-003	SW846-9056A
	Bicarbonate Alkalinity	203	0.725	2.00			122809-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122809-004	SM 2320B
TAV-MW4 13-Aug-24	Bromide	0.447	0.0670	0.200			122851-003	SW846-9056A
	Chloride	37.8	0.670	2.00	B		122851-003	SW846-9056A
	Fluoride	1.24	0.0330	0.100			122851-003	SW846-9056A
	Sulfate	35.3	1.33	4.00			122851-003	SW846-9056A
	Bicarbonate Alkalinity	175	0.725	2.00			122851-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122851-004	SM 2320B
TAV-MW5 30-Jul-24	Bromide	0.191	0.0670	0.200	J	J	122818-003	SW846-9056A
	Chloride	17.3	0.335	1.00		J	122818-003	SW846-9056A
	Fluoride	1.31	0.0330	0.100		J	122818-003	SW846-9056A
	Sulfate	40.0	0.665	2.00		J	122818-003	SW846-9056A
	Bicarbonate Alkalinity	185	0.725	2.00		J	122818-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U	UJ	122818-004	SM 2320B

See notes at end of tables.

Table 5B-5 (continued)
Summary of Major Anion and Alkalinity Results for Waste Characterization Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW6	Bromide	0.895	0.0670	0.200			122855-003	SW846-9056A
14-Aug-24	Chloride	89.4	1.34	4.00	B		122855-003	SW846-9056A
	Fluoride	1.15	0.0330	0.100			122855-003	SW846-9056A
	Sulfate	36.6	0.665	2.00			122855-003	SW846-9056A
	Bicarbonate Alkalinity	201	0.725	2.00			122855-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122855-004	SM 2320B
TAV-MW7	Bromide	0.253	0.0670	0.200			122807-003	SW846-9056A
25-Jul-24	Chloride	28.6	0.335	1.00			122807-003	SW846-9056A
	Fluoride	1.14	0.0330	0.100			122807-003	SW846-9056A
	Sulfate	63.5	0.665	2.00			122807-003	SW846-9056A
	Bicarbonate Alkalinity	228	0.725	2.00			122807-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122807-004	SM 2320B
TAV-MW8	Bromide	0.342	0.0670	0.200			122849-003	SW846-9056A
12-Aug-24	Chloride	39.5	0.670	2.00	B		122849-003	SW846-9056A
	Fluoride	1.42	0.0330	0.100			122849-003	SW846-9056A
	Sulfate	45.3	1.33	4.00			122849-003	SW846-9056A
	Bicarbonate Alkalinity	205	0.725	2.00			122849-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122849-004	SM 2320B
TAV-MW9	Bromide	0.254	0.0670	0.200			122804-003	SW846-9056A
24-Jul-24	Chloride	32.3	0.335	1.00			122804-003	SW846-9056A
	Fluoride	0.952	0.0330	0.100			122804-003	SW846-9056A
	Sulfate	56.6	0.665	2.00			122804-003	SW846-9056A
	Bicarbonate Alkalinity	234	0.725	2.00			122804-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122804-004	SM 2320B
TAV-MW10	Bromide	0.360	0.0670	0.200			122859-003	SW846-9056A
15-Aug-24	Chloride	46.3	0.670	2.00	B		122859-003	SW846-9056A
	Fluoride	1.50	0.0330	0.100			122859-003	SW846-9056A
	Sulfate	45.5	1.33	4.00			122859-003	SW846-9056A
	Bicarbonate Alkalinity	192	0.725	2.00			122859-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122859-004	SM 2320B
TAV-MW11	Bromide	0.556	0.0670	0.200			122845-003	SW846-9056A
08-Aug-24	Chloride	56.9	0.670	2.00			122845-003	SW846-9056A
	Fluoride	1.49	0.0330	0.100			122845-003	SW846-9056A
	Sulfate	44.3	1.33	4.00			122845-003	SW846-9056A
	Bicarbonate Alkalinity	182	0.725	2.00			122845-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122845-004	SM 2320B

See notes at end of tables.

Table 5B-5 (concluded)
Summary of Major Anion and Alkalinity Results for Waste Characterization Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW12 07-Aug-24	Bromide	0.335	0.0670	0.200			122843-003	SW846-9056A
	Chloride	55.3	0.670	2.00			122843-003	SW846-9056A
	Fluoride	1.18	0.0330	0.100			122843-003	SW846-9056A
	Sulfate	63.9	1.33	4.00			122843-003	SW846-9056A
	Bicarbonate Alkalinity	241	0.725	2.00			122843-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122843-004	SM 2320B
TAV-MW13 29-Jul-24	Bromide	0.183	0.0670	0.200	J		122813-003	SW846-9056A
	Chloride	16.7	0.335	1.00			122813-003	SW846-9056A
	Fluoride	1.23	0.0330	0.100			122813-003	SW846-9056A
	Sulfate	48.8	0.665	2.00			122813-003	SW846-9056A
	Bicarbonate Alkalinity	202	0.725	2.00			122813-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122813-004	SM 2320B
TAV-MW14 09-Aug-24	Bromide	0.369	0.0670	0.200			122847-003	SW846-9056A
	Chloride	55.6	0.670	2.00			122847-003	SW846-9056A
	Fluoride	1.31	0.0330	0.100			122847-003	SW846-9056A
	Sulfate	59.9	1.33	4.00			122847-003	SW846-9056A
	Bicarbonate Alkalinity	218	0.725	2.00			122847-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122847-004	SM 2320B
TAV-MW15 23-Jul-24	Bromide	0.492	0.0670	0.200			122800-003	SW846-9056A
	Chloride	71.3	1.34	4.00			122800-003	SW846-9056A
	Fluoride	0.992	0.0330	0.100			122800-003	SW846-9056A
	Sulfate	54.3	2.66	8.00			122800-003	SW846-9056A
	Bicarbonate Alkalinity	263	0.725	2.00			122800-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122800-004	SM 2320B
TAV-MW16 31-Jul-24	Bromide	0.557	0.0670	0.200			122823-003	SW846-9056A
	Chloride	83.0	1.34	4.00			122823-003	SW846-9056A
	Fluoride	1.03	0.0330	0.100			122823-003	SW846-9056A
	Sulfate	57.0	2.66	8.00			122823-003	SW846-9056A
	Bicarbonate Alkalinity	286	0.725	2.00			122823-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122823-004	SM 2320B
TAV-MW17 02-Aug-24	Bromide	0.214	0.0670	0.200			122827-003	SW846-9056A
	Chloride	16.2	0.335	1.00			122827-003	SW846-9056A
	Fluoride	1.33	0.0330	0.100			122827-003	SW846-9056A
	Sulfate	29.2	0.665	2.00			122827-003	SW846-9056A
	Bicarbonate Alkalinity	158	0.725	2.00			122827-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122827-004	SM 2320B

See notes at end of tables.

Table 5B-6
Summary of TAL Metals plus Total Uranium Results for Waste Characterization Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW17	Aluminum	ND	0.0193	0.0500	U		121726-006	SW846-3005A/6020B
29-Jan-24	Antimony	ND	0.00100	0.00300	U		121726-006	SW846-3005A/6020B
	Arsenic	ND	0.00200	0.00500	U		121726-006	SW846-3005A/6020B
	Barium	0.0965	0.000670	0.00400			121726-006	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		121726-006	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		121726-006	SW846-3005A/6020B
	Calcium	38.9	0.0800	0.200			121726-006	SW846-3005A/6020B
	Chromium	0.00639	0.00300	0.0100	J		121726-006	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		121726-006	SW846-3005A/6020B
	Copper	ND	0.000300	0.00200	U		121726-006	SW846-3005A/6020B
	Iron	ND	0.0330	0.100	U		121726-006	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		121726-006	SW846-3005A/6020B
	Magnesium	11.7	0.0100	0.0300			121726-006	SW846-3005A/6020B
	Manganese	ND	0.00100	0.00500	U		121726-006	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U		121726-006	SW846-7470A
	Molybdenum*	0.00867	0.000200	0.00100			121726-006	SW846-3005A/6020B
	Nickel	ND	0.000600	0.00200	U		121726-006	SW846-3005A/6020B
	Potassium	2.76	0.0800	0.300			121726-006	SW846-3005A/6020B
	Selenium	0.00234	0.00150	0.00500	J		121726-006	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		121726-006	SW846-3005A/6020B
	Sodium	39.1	0.0800	0.250			121726-006	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		121726-006	SW846-3005A/6020B
	Uranium	0.00239	0.0000670	0.000200			121726-006	SW846-3005A/6020B
	Vanadium	0.00770	0.00330	0.0200	J		121726-006	SW846-3005A/6020B
	Zinc	ND	0.00330	0.0200	U		121726-006	SW846-3005A/6020B

* Molybdenum was analyzed for TAV-MW17 for waste characterization purposes.

See notes at end of tables.

Table 5B-6 (continued)
Summary of TAL Metals plus Total Uranium Results for Waste Characterization Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
LWDS-MW1	Aluminum	ND	0.0193	0.0500	U		122857-005	SW846-3005A/6020B
19-Aug-24	Antimony	ND	0.00100	0.00300	U		122857-005	SW846-3005A/6020B
	Arsenic	0.00251	0.00200	0.00500	J		122857-005	SW846-3005A/6020B
	Barium	0.0822	0.000670	0.00400			122857-005	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122857-005	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		122857-005	SW846-3005A/6020B
	Calcium	67.1	0.800	2.00			122857-005	SW846-3005A/6020B
	Chromium	ND	0.00300	0.0100	U		122857-005	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122857-005	SW846-3005A/6020B
	Copper	ND	0.000300	0.00200	U		122857-005	SW846-3005A/6020B
	Iron	ND	0.0330	0.100	U		122857-005	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122857-005	SW846-3005A/6020B
	Magnesium	20.5	0.0100	0.0300			122857-005	SW846-3005A/6020B
	Manganese	0.00122	0.00100	0.00500	J		122857-005	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U		122857-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122857-005	SW846-3005A/6020B
	Potassium	3.06	0.0800	0.300			122857-005	SW846-3005A/6020B
	Selenium	0.00557	0.00150	0.00500			122857-005	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122857-005	SW846-3005A/6020B
	Sodium	62.8	0.800	2.50			122857-005	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122857-005	SW846-3005A/6020B
	Uranium	0.00291	0.0000670	0.000200			122857-005	SW846-3005A/6020B
	Vanadium	0.00627	0.00330	0.0200	J		122857-005	SW846-3005A/6020B
	Zinc	0.00337	0.00330	0.0200	J		122857-005	SW846-3005A/6020B

See notes at end of tables.

Table 5B-6 (continued)
Summary of TAL Metals plus Total Uranium Results for Waste Characterization Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW2	Aluminum	0.0320	0.0193	0.0500	J		122839-005	SW846-3005A/6020B
06-Aug-24	Antimony	ND	0.00100	0.00300	U		122839-005	SW846-3005A/6020B
	Arsenic	ND	0.00200	0.00500	U		122839-005	SW846-3005A/6020B
	Barium	0.0606	0.000670	0.00400			122839-005	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122839-005	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		122839-005	SW846-3005A/6020B
	Calcium	69.9	0.800	2.00			122839-005	SW846-3005A/6020B
	Chromium	ND	0.00300	0.0100	U		122839-005	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122839-005	SW846-3005A/6020B
	Copper	ND	0.000300	0.00200	U		122839-005	SW846-3005A/6020B
	Iron	0.0336	0.0330	0.100	J		122839-005	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122839-005	SW846-3005A/6020B
	Magnesium	22.5	0.0100	0.0300			122839-005	SW846-3005A/6020B
	Manganese	ND	0.00100	0.00500	U		122839-005	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U		122839-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122839-005	SW846-3005A/6020B
	Potassium	3.84	0.0800	0.300			122839-005	SW846-3005A/6020B
	Selenium	0.00304	0.00150	0.00500	J		122839-005	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122839-005	SW846-3005A/6020B
	Sodium	65.0	0.800	2.50			122839-005	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122839-005	SW846-3005A/6020B
	Uranium	0.00593	0.0000670	0.000200			122839-005	SW846-3005A/6020B
	Vanadium	0.00744	0.00330	0.0200	J		122839-005	SW846-3005A/6020B
	Zinc	ND	0.00330	0.0200	U		122839-005	SW846-3005A/6020B

See notes at end of tables.

Table 5B-6 (continued)
Summary of TAL Metals plus Total Uranium Results for Waste Characterization Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW3	Aluminum	ND	0.0193	0.0500	U		122809-005	SW846-3005A/6020B
26-Jul-24	Antimony	ND	0.00100	0.00300	U		122809-005	SW846-3005A/6020B
	Arsenic	ND	0.00200	0.00500	U		122809-005	SW846-3005A/6020B
	Barium	0.0471	0.000670	0.00400			122809-005	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122809-005	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		122809-005	SW846-3005A/6020B
	Calcium	60.2	0.800	2.00			122809-005	SW846-3005A/6020B
	Chromium	ND	0.00300	0.0100	U		122809-005	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122809-005	SW846-3005A/6020B
	Copper	0.000318	0.000300	0.00200	J		122809-005	SW846-3005A/6020B
	Iron	ND	0.0330	0.100	U		122809-005	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122809-005	SW846-3005A/6020B
	Magnesium	15.5	0.0100	0.0300			122809-005	SW846-3005A/6020B
	Manganese	ND	0.00100	0.00500	U		122809-005	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U		122809-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122809-005	SW846-3005A/6020B
	Potassium	4.62	0.0800	0.300			122809-005	SW846-3005A/6020B
	Selenium	0.00233	0.00150	0.00500	J		122809-005	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122809-005	SW846-3005A/6020B
	Sodium	56.2	0.800	2.50			122809-005	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122809-005	SW846-3005A/6020B
	Uranium	0.00351	0.0000670	0.000200			122809-005	SW846-3005A/6020B
	Vanadium	0.00643	0.00330	0.0200	J		122809-005	SW846-3005A/6020B
	Zinc	ND	0.00330	0.0200	U		122809-005	SW846-3005A/6020B

See notes at end of tables.

Table 5B-6 (continued)
Summary of TAL Metals plus Total Uranium Results for Waste Characterization Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW4	Aluminum	ND	0.0193	0.0500	U		122851-005	SW846-3005A/6020B
13-Aug-24	Antimony	ND	0.00100	0.00300	U		122851-005	SW846-3005A/6020B
	Arsenic	ND	0.00200	0.00500	U		122851-005	SW846-3005A/6020B
	Barium	0.0843	0.000670	0.00400			122851-005	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122851-005	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		122851-005	SW846-3005A/6020B
	Calcium	54.0	0.800	2.00			122851-005	SW846-3005A/6020B
	Chromium	0.0355	0.00300	0.0100			122851-005	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122851-005	SW846-3005A/6020B
	Copper	ND	0.000300	0.00200	U		122851-005	SW846-3005A/6020B
	Iron	ND	0.0330	0.100	U		122851-005	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122851-005	SW846-3005A/6020B
	Magnesium	14.8	0.0100	0.0300			122851-005	SW846-3005A/6020B
	Manganese	ND	0.00100	0.00500	U		122851-005	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U		122851-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122851-005	SW846-3005A/6020B
	Potassium	3.21	0.0800	0.300			122851-005	SW846-3005A/6020B
	Selenium	0.00347	0.00150	0.00500	J		122851-005	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122851-005	SW846-3005A/6020B
	Sodium	46.7	0.0800	0.250			122851-005	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122851-005	SW846-3005A/6020B
	Uranium	0.00303	0.0000670	0.000200			122851-005	SW846-3005A/6020B
	Vanadium	0.00809	0.00330	0.0200	J		122851-005	SW846-3005A/6020B
	Zinc	ND	0.00330	0.0200	U		122851-005	SW846-3005A/6020B

See notes at end of tables.

Table 5B-6 (continued)
Summary of TAL Metals plus Total Uranium Results for Waste Characterization Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW5	Aluminum	0.247	0.0193	0.0500			122818-005	SW846-3005A/6020B
30-Jul-24	Antimony	ND	0.00100	0.00300	U		122818-005	SW846-3005A/6020B
	Arsenic	0.00216	0.00200	0.00500	J		122818-005	SW846-3005A/6020B
	Barium	0.0639	0.000670	0.00400			122818-005	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122818-005	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		122818-005	SW846-3005A/6020B
	Calcium	48.6	0.0800	0.200			122818-005	SW846-3005A/6020B
	Chromium	ND	0.00300	0.0100	U		122818-005	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122818-005	SW846-3005A/6020B
	Copper	ND	0.000300	0.00200	U		122818-005	SW846-3005A/6020B
	Iron	0.199	0.0330	0.100			122818-005	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122818-005	SW846-3005A/6020B
	Magnesium	15.2	0.0100	0.0300			122818-005	SW846-3005A/6020B
	Manganese	0.00269	0.00100	0.00500	J		122818-005	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U	UJ	122818-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122818-005	SW846-3005A/6020B
	Potassium	2.93	0.0800	0.300			122818-005	SW846-3005A/6020B
	Selenium	0.00259	0.00150	0.00500	J		122818-005	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122818-005	SW846-3005A/6020B
	Sodium	49.4	0.0800	0.250			122818-005	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122818-005	SW846-3005A/6020B
	Uranium	0.00330	0.0000670	0.000200			122818-005	SW846-3005A/6020B
	Vanadium	0.00847	0.00330	0.0200	J		122818-005	SW846-3005A/6020B
	Zinc	ND	0.00330	0.0200	U		122818-005	SW846-3005A/6020B

See notes at end of tables.

Table 5B-6 (continued)
Summary of TAL Metals plus Total Uranium Results for Waste Characterization Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW6	Aluminum	0.0648	0.0193	0.0500			122855-005	SW846-3005A/6020B
14-Aug-24	Antimony	ND	0.00100	0.00300	U		122855-005	SW846-3005A/6020B
	Arsenic	ND	0.00200	0.00500	U		122855-005	SW846-3005A/6020B
	Barium	0.0734	0.000670	0.00400			122855-005	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122855-005	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		122855-005	SW846-3005A/6020B
	Calcium	71.0	0.800	2.00			122855-005	SW846-3005A/6020B
	Chromium	ND	0.00300	0.0100	U		122855-005	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122855-005	SW846-3005A/6020B
	Copper	ND	0.000300	0.00200	U		122855-005	SW846-3005A/6020B
	Iron	0.0611	0.0330	0.100	J		122855-005	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122855-005	SW846-3005A/6020B
	Magnesium	20.8	0.0100	0.0300			122855-005	SW846-3005A/6020B
	Manganese	0.0181	0.00100	0.00500			122855-005	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U		122855-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122855-005	SW846-3005A/6020B
	Potassium	4.01	0.0800	0.300			122855-005	SW846-3005A/6020B
	Selenium	0.00363	0.00150	0.00500	J		122855-005	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122855-005	SW846-3005A/6020B
	Sodium	65.8	0.800	2.50			122855-005	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122855-005	SW846-3005A/6020B
	Uranium	0.00379	0.0000670	0.000200			122855-005	SW846-3005A/6020B
	Vanadium	0.00605	0.00330	0.0200	J		122855-005	SW846-3005A/6020B
	Zinc	ND	0.00330	0.0200	U		122855-005	SW846-3005A/6020B

See notes at end of tables.

Table 5B-6 (continued)
Summary of TAL Metals plus Total Uranium Results for Waste Characterization Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW7	Aluminum	ND	0.0193	0.0500	U		122807-005	SW846-3005A/6020B
25-Jul-24	Antimony	ND	0.00100	0.00300	U		122807-005	SW846-3005A/6020B
	Arsenic	ND	0.00200	0.00500	U		122807-005	SW846-3005A/6020B
	Barium	0.0529	0.000670	0.00400			122807-005	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122807-005	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		122807-005	SW846-3005A/6020B
	Calcium	59.9	0.800	2.00			122807-005	SW846-3005A/6020B
	Chromium	ND	0.00300	0.0100	U		122807-005	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122807-005	SW846-3005A/6020B
	Copper	0.000303	0.000300	0.00200	J		122807-005	SW846-3005A/6020B
	Iron	ND	0.0330	0.100	U		122807-005	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122807-005	SW846-3005A/6020B
	Magnesium	18.7	0.0100	0.0300			122807-005	SW846-3005A/6020B
	Manganese	0.00110	0.00100	0.00500	J		122807-005	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U		122807-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122807-005	SW846-3005A/6020B
	Potassium	4.08	0.0800	0.300			122807-005	SW846-3005A/6020B
	Selenium	0.00225	0.00150	0.00500	J		122807-005	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122807-005	SW846-3005A/6020B
	Sodium	55.8	0.800	2.50			122807-005	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122807-005	SW846-3005A/6020B
	Uranium	0.00447	0.0000670	0.000200			122807-005	SW846-3005A/6020B
	Vanadium	0.00780	0.00330	0.0200	J		122807-005	SW846-3005A/6020B
	Zinc	ND	0.00330	0.0200	U		122807-005	SW846-3005A/6020B

See notes at end of tables.

Table 5B-6 (continued)
Summary of TAL Metals plus Total Uranium Results for Waste Characterization Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW8	Aluminum	0.0752	0.0193	0.0500			122849-005	SW846-3005A/6020B
12-Aug-24	Antimony	ND	0.00100	0.00300	U		122849-005	SW846-3005A/6020B
	Arsenic	ND	0.00200	0.00500	U		122849-005	SW846-3005A/6020B
	Barium	0.0567	0.000670	0.00400			122849-005	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122849-005	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		122849-005	SW846-3005A/6020B
	Calcium	59.2	0.800	2.00			122849-005	SW846-3005A/6020B
	Chromium	0.00313	0.00300	0.0100	J		122849-005	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122849-005	SW846-3005A/6020B
	Copper	ND	0.000300	0.00200	U		122849-005	SW846-3005A/6020B
	Iron	0.0629	0.0330	0.100	J		122849-005	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122849-005	SW846-3005A/6020B
	Magnesium	16.9	0.0100	0.0300			122849-005	SW846-3005A/6020B
	Manganese	0.00146	0.00100	0.00500	J		122849-005	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U		122849-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122849-005	SW846-3005A/6020B
	Potassium	3.90	0.0800	0.300			122849-005	SW846-3005A/6020B
	Selenium	0.00311	0.00150	0.00500	J		122849-005	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122849-005	SW846-3005A/6020B
	Sodium	58.8	0.800	2.50			122849-005	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122849-005	SW846-3005A/6020B
	Uranium	0.00338	0.0000670	0.000200			122849-005	SW846-3005A/6020B
	Vanadium	0.00762	0.00330	0.0200	J		122849-005	SW846-3005A/6020B
	Zinc	0.00418	0.00330	0.0200	J		122849-005	SW846-3005A/6020B

See notes at end of tables.

Table 5B-6 (continued)
Summary of TAL Metals plus Total Uranium Results for Waste Characterization Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW9	Aluminum	0.0622	0.0193	0.0500			122804-005	SW846-3005A/6020B
24-Jul-24	Antimony	ND	0.00100	0.00300	U		122804-005	SW846-3005A/6020B
	Arsenic	ND	0.00200	0.00500	U		122804-005	SW846-3005A/6020B
	Barium	0.0638	0.000670	0.00400			122804-005	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122804-005	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		122804-005	SW846-3005A/6020B
	Calcium	61.8	0.800	2.00			122804-005	SW846-3005A/6020B
	Chromium	ND	0.00300	0.0100	U		122804-005	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122804-005	SW846-3005A/6020B
	Copper	0.000594	0.000300	0.00200	J	0.002U	122804-005	SW846-3005A/6020B
	Iron	0.0542	0.0330	0.100	J		122804-005	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122804-005	SW846-3005A/6020B
	Magnesium	19.4	0.0100	0.0300			122804-005	SW846-3005A/6020B
	Manganese	0.00263	0.00100	0.00500	J		122804-005	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U		122804-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122804-005	SW846-3005A/6020B
	Potassium	4.19	0.0800	0.300			122804-005	SW846-3005A/6020B
	Selenium	0.00188	0.00150	0.00500	J		122804-005	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122804-005	SW846-3005A/6020B
	Sodium	56.2	0.800	2.50			122804-005	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122804-005	SW846-3005A/6020B
	Uranium	0.00511	0.0000670	0.000200			122804-005	SW846-3005A/6020B
	Vanadium	0.00782	0.00330	0.0200	J		122804-005	SW846-3005A/6020B
	Zinc	0.00830	0.00330	0.0200	J		122804-005	SW846-3005A/6020B

See notes at end of tables.

Table 5B-6 (continued)
Summary of TAL Metals plus Total Uranium Results for Waste Characterization Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW10	Aluminum	ND	0.0193	0.0500	U		122859-005	SW846-3005A/6020B
15-Aug-24	Antimony	ND	0.00100	0.00300	U		122859-005	SW846-3005A/6020B
	Arsenic	ND	0.00200	0.00500	U		122859-005	SW846-3005A/6020B
	Barium	0.0604	0.000670	0.00400			122859-005	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122859-005	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		122859-005	SW846-3005A/6020B
	Calcium	62.9	0.800	2.00			122859-005	SW846-3005A/6020B
	Chromium	ND	0.00300	0.0100	U		122859-005	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122859-005	SW846-3005A/6020B
	Copper	ND	0.000300	0.00200	U		122859-005	SW846-3005A/6020B
	Iron	ND	0.0330	0.100	U		122859-005	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122859-005	SW846-3005A/6020B
	Magnesium	17.3	0.0100	0.0300			122859-005	SW846-3005A/6020B
	Manganese	ND	0.00100	0.00500	U		122859-005	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U		122859-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122859-005	SW846-3005A/6020B
	Potassium	4.33	0.0800	0.300			122859-005	SW846-3005A/6020B
	Selenium	0.00253	0.00150	0.00500	J		122859-005	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122859-005	SW846-3005A/6020B
	Sodium	59.8	0.800	2.50			122859-005	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122859-005	SW846-3005A/6020B
	Uranium	0.00313	0.0000670	0.000200			122859-005	SW846-3005A/6020B
	Vanadium	0.00701	0.00330	0.0200	J		122859-005	SW846-3005A/6020B
	Zinc	ND	0.00330	0.0200	U		122859-005	SW846-3005A/6020B

See notes at end of tables.

Table 5B-6 (continued)
Summary of TAL Metals plus Total Uranium Results for Waste Characterization Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW11	Aluminum	ND	0.0193	0.0500	U		122845-005	SW846-3005A/6020B
08-Aug-24	Antimony	ND	0.00100	0.00300	U		122845-005	SW846-3005A/6020B
	Arsenic	ND	0.00200	0.00500	U		122845-005	SW846-3005A/6020B
	Barium	0.0727	0.000670	0.00400			122845-005	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122845-005	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		122845-005	SW846-3005A/6020B
	Calcium	57.2	0.800	2.00			122845-005	SW846-3005A/6020B
	Chromium	ND	0.00300	0.0100	U		122845-005	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122845-005	SW846-3005A/6020B
	Copper	ND	0.000300	0.00200	U		122845-005	SW846-3005A/6020B
	Iron	ND	0.0330	0.100	U		122845-005	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122845-005	SW846-3005A/6020B
	Magnesium	16.1	0.0100	0.0300			122845-005	SW846-3005A/6020B
	Manganese	ND	0.00100	0.00500	U		122845-005	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U		122845-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122845-005	SW846-3005A/6020B
	Potassium	3.82	0.0800	0.300			122845-005	SW846-3005A/6020B
	Selenium	0.00383	0.00150	0.00500	J		122845-005	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122845-005	SW846-3005A/6020B
	Sodium	54.8	0.800	2.50			122845-005	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122845-005	SW846-3005A/6020B
	Uranium	0.00296	0.0000670	0.000200			122845-005	SW846-3005A/6020B
	Vanadium	0.00717	0.00330	0.0200	J		122845-005	SW846-3005A/6020B
	Zinc	ND	0.00330	0.0200	U		122845-005	SW846-3005A/6020B

See notes at end of tables.

Table 5B-6 (continued)
Summary of TAL Metals plus Total Uranium Results for Waste Characterization Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW12	Aluminum	ND	0.0193	0.0500	U		122843-005	SW846-3005A/6020B
07-Aug-24	Antimony	ND	0.00100	0.00300	U		122843-005	SW846-3005A/6020B
	Arsenic	ND	0.00200	0.00500	U		122843-005	SW846-3005A/6020B
	Barium	0.0731	0.000670	0.00400			122843-005	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122843-005	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		122843-005	SW846-3005A/6020B
	Calcium	70.8	0.800	2.00			122843-005	SW846-3005A/6020B
	Chromium	ND	0.00300	0.0100	U		122843-005	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122843-005	SW846-3005A/6020B
	Copper	ND	0.000300	0.00200	U		122843-005	SW846-3005A/6020B
	Iron	ND	0.0330	0.100	U		122843-005	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122843-005	SW846-3005A/6020B
	Magnesium	21.8	0.0100	0.0300			122843-005	SW846-3005A/6020B
	Manganese	ND	0.00100	0.00500	U		122843-005	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U		122843-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122843-005	SW846-3005A/6020B
	Potassium	4.01	0.0800	0.300			122843-005	SW846-3005A/6020B
	Selenium	0.00261	0.00150	0.00500	J		122843-005	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122843-005	SW846-3005A/6020B
	Sodium	66.4	0.800	2.50			122843-005	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122843-005	SW846-3005A/6020B
	Uranium	0.00634	0.0000670	0.000200			122843-005	SW846-3005A/6020B
	Vanadium	0.00411	0.00330	0.0200	J		122843-005	SW846-3005A/6020B
	Zinc	ND	0.00330	0.0200	U		122843-005	SW846-3005A/6020B

See notes at end of tables.

Table 5B-6 (continued)
Summary of TAL Metals plus Total Uranium Results for Waste Characterization Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW13	Aluminum	0.0208	0.0193	0.0500	J		122813-005	SW846-3005A/6020B
29-Jul-24	Antimony	ND	0.00100	0.00300	U		122813-005	SW846-3005A/6020B
	Arsenic	0.00208	0.00200	0.00500	J		122813-005	SW846-3005A/6020B
	Barium	0.0571	0.000670	0.00400			122813-005	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122813-005	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		122813-005	SW846-3005A/6020B
	Calcium	54.1	0.800	2.00			122813-005	SW846-3005A/6020B
	Chromium	ND	0.00300	0.0100	U		122813-005	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122813-005	SW846-3005A/6020B
	Copper	ND	0.000300	0.00200	U		122813-005	SW846-3005A/6020B
	Iron	ND	0.0330	0.100	U		122813-005	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122813-005	SW846-3005A/6020B
	Magnesium	15.7	0.0100	0.0300			122813-005	SW846-3005A/6020B
	Manganese	0.00306	0.00100	0.00500	J		122813-005	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U		122813-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122813-005	SW846-3005A/6020B
	Potassium	3.41	0.0800	0.300			122813-005	SW846-3005A/6020B
	Selenium	0.00241	0.00150	0.00500	J		122813-005	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122813-005	SW846-3005A/6020B
	Sodium	49.7	0.0800	0.250			122813-005	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122813-005	SW846-3005A/6020B
	Uranium	0.00352	0.0000670	0.000200			122813-005	SW846-3005A/6020B
	Vanadium	0.00759	0.00330	0.0200	J		122813-005	SW846-3005A/6020B
	Zinc	ND	0.00330	0.0200	U		122813-005	SW846-3005A/6020B

See notes at end of tables.

Table 5B-6 (continued)
Summary of TAL Metals plus Total Uranium Results for Waste Characterization Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW14	Aluminum	ND	0.0193	0.0500	U		122847-005	SW846-3005A/6020B
09-Aug-24	Antimony	ND	0.00100	0.00300	U		122847-005	SW846-3005A/6020B
	Arsenic	ND	0.00200	0.00500	U		122847-005	SW846-3005A/6020B
	Barium	0.0623	0.000670	0.00400			122847-005	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122847-005	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		122847-005	SW846-3005A/6020B
	Calcium	65.4	0.800	2.00			122847-005	SW846-3005A/6020B
	Chromium	ND	0.00300	0.0100	U		122847-005	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122847-005	SW846-3005A/6020B
	Copper	ND	0.000300	0.00200	U		122847-005	SW846-3005A/6020B
	Iron	ND	0.0330	0.100	U		122847-005	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122847-005	SW846-3005A/6020B
	Magnesium	20.6	0.0100	0.0300			122847-005	SW846-3005A/6020B
	Manganese	ND	0.00100	0.00500	U		122847-005	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U		122847-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122847-005	SW846-3005A/6020B
	Potassium	4.36	0.0800	0.300			122847-005	SW846-3005A/6020B
	Selenium	0.00266	0.00150	0.00500	J		122847-005	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122847-005	SW846-3005A/6020B
	Sodium	62.7	0.800	2.50			122847-005	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122847-005	SW846-3005A/6020B
	Uranium	0.00480	0.0000670	0.000200			122847-005	SW846-3005A/6020B
	Vanadium	0.00634	0.00330	0.0200	J		122847-005	SW846-3005A/6020B
	Zinc	ND	0.00330	0.0200	U		122847-005	SW846-3005A/6020B

See notes at end of tables.

Table 5B-6 (continued)
Summary of TAL Metals plus Total Uranium Results for Waste Characterization Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW15	Aluminum	ND	0.0193	0.0500	U		122800-005	SW846-3005A/6020B
23-Jul-24	Antimony	ND	0.00100	0.00300	U		122800-005	SW846-3005A/6020B
	Arsenic	ND	0.00200	0.00500	U		122800-005	SW846-3005A/6020B
	Barium	0.0693	0.000670	0.00400			122800-005	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122800-005	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		122800-005	SW846-3005A/6020B
	Calcium	77.3	0.800	2.00			122800-005	SW846-3005A/6020B
	Chromium	ND	0.00300	0.0100	U		122800-005	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122800-005	SW846-3005A/6020B
	Copper	ND	0.000300	0.00200	U		122800-005	SW846-3005A/6020B
	Iron	ND	0.0330	0.100	U		122800-005	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122800-005	SW846-3005A/6020B
	Magnesium	27.0	0.0100	0.0300			122800-005	SW846-3005A/6020B
	Manganese	ND	0.00100	0.00500	U		122800-005	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U		122800-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122800-005	SW846-3005A/6020B
	Potassium	4.44	0.0800	0.300			122800-005	SW846-3005A/6020B
	Selenium	0.00267	0.00150	0.00500	J		122800-005	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122800-005	SW846-3005A/6020B
	Sodium	68.8	0.800	2.50			122800-005	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122800-005	SW846-3005A/6020B
	Uranium	0.00730	0.0000670	0.000200			122800-005	SW846-3005A/6020B
	Vanadium	0.00539	0.00330	0.0200	J		122800-005	SW846-3005A/6020B
	Zinc	ND	0.00330	0.0200	U		122800-005	SW846-3005A/6020B

See notes at end of tables.

Table 5B-6 (continued)
Summary of TAL Metals plus Total Uranium Results for Waste Characterization Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW16	Aluminum	ND	0.0193	0.0500	U		122823-005	SW846-3005A/6020B
31-Jul-24	Antimony	ND	0.00100	0.00300	U		122823-005	SW846-3005A/6020B
	Arsenic	ND	0.00200	0.00500	U		122823-005	SW846-3005A/6020B
	Barium	0.0632	0.000670	0.00400			122823-005	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122823-005	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		122823-005	SW846-3005A/6020B
	Calcium	79.8	0.800	2.00			122823-005	SW846-3005A/6020B
	Chromium	ND	0.00300	0.0100	U		122823-005	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122823-005	SW846-3005A/6020B
	Copper	ND	0.000300	0.00200	U		122823-005	SW846-3005A/6020B
	Iron	ND	0.0330	0.100	U		122823-005	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122823-005	SW846-3005A/6020B
	Magnesium	27.8	0.0100	0.0300			122823-005	SW846-3005A/6020B
	Manganese	ND	0.00100	0.00500	U		122823-005	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U		122823-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122823-005	SW846-3005A/6020B
	Potassium	4.33	0.0800	0.300			122823-005	SW846-3005A/6020B
	Selenium	0.00244	0.00150	0.00500	J		122823-005	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122823-005	SW846-3005A/6020B
	Sodium	71.3	0.800	2.50			122823-005	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122823-005	SW846-3005A/6020B
	Uranium	0.00639	0.0000670	0.000200			122823-005	SW846-3005A/6020B
	Vanadium	0.00628	0.00330	0.0200	J		122823-005	SW846-3005A/6020B
	Zinc	ND	0.00330	0.0200	U		122823-005	SW846-3005A/6020B

See notes at end of tables.

Table 5B-6 (concluded)
Summary of TAL Metals plus Total Uranium Results for Waste Characterization Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW17	Aluminum	ND	0.0193	0.0500	U		122827-005	SW846-3005A/6020B
02-Aug-24	Antimony	ND	0.00100	0.00300	U		122827-005	SW846-3005A/6020B
	Arsenic	0.00202	0.00200	0.00500	J		122827-005	SW846-3005A/6020B
	Barium	0.0957	0.000670	0.00400			122827-005	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122827-005	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		122827-005	SW846-3005A/6020B
	Calcium	41.3	0.0800	0.200			122827-005	SW846-3005A/6020B
	Chromium	0.00666	0.00300	0.0100	J		122827-005	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122827-005	SW846-3005A/6020B
	Copper	ND	0.000300	0.00200	U		122827-005	SW846-3005A/6020B
	Iron	0.0342	0.0330	0.100	J		122827-005	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122827-005	SW846-3005A/6020B
	Magnesium	12.3	0.0100	0.0300			122827-005	SW846-3005A/6020B
	Manganese	ND	0.00100	0.00500	U		122827-005	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U		122827-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122827-005	SW846-3005A/6020B
	Potassium	2.71	0.0800	0.300			122827-005	SW846-3005A/6020B
	Selenium	0.00264	0.00150	0.00500	J		122827-005	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122827-005	SW846-3005A/6020B
	Sodium	40.6	0.0800	0.250			122827-005	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122827-005	SW846-3005A/6020B
	Uranium	0.00254	0.0000670	0.000200			122827-005	SW846-3005A/6020B
	Vanadium	0.00772	0.00330	0.0200	J		122827-005	SW846-3005A/6020B
	Zinc	0.00346	0.00330	0.0200	J		122827-005	SW846-3005A/6020B

See notes at end of tables.

Table 5B-7
Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, and Tritium Results for Waste Characterization Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Activity[a] (pCi/L)	MDA[b] (pCi/L)	Critical Level[c] (pCi/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW17	Americium-241	-3.53 ± 13.3	21.3	10.3	U	BD	121726-007	EPA 901.1
29-Jan-24	Cesium-137	0.764 ± 5.97	4.14	1.97	U	BD	121726-007	EPA 901.1
	Cobalt-60	-1.08 ± 2.60	4.34	2.01	U	BD	121726-007	EPA 901.1
	Potassium-40	-30.4 ± 56.8	74.5	35.7	U	BD	121726-007	EPA 901.1
	Gross Alpha	4.13	NA	NA	NA	None	121726-008	EPA 900.0/SW846-9310
	Gross Beta	3.04 ± 0.905	1.35	0.645		J	121726-008	EPA 900.0/SW846-9310
	Tritium	-25.1 ± 68.4	136	60.3	U	BD	121726-009	EPA 906.0M
LWDS-MW1	Americium-241	3.78 ± 7.15	12.8	6.02	U	BD	122857-006	EPA 901.1
19-Aug-24	Cesium-137	-1.20 ± 2.48	4.20	1.84	U	BD	122857-006	EPA 901.1
	Cobalt-60	0.500 ± 2.66	5.47	2.34	U	BD	122857-006	EPA 901.1
	Potassium-40	13.5 ± 57.7	53.6	22.9	U	BD	122857-006	EPA 901.1
	Gross Alpha	1.68	NA	NA	NA	None	122857-007	EPA 900.0/SW846-9310
	Gross Beta	4.49 ± 1.09	1.58	0.762		J	122857-007	EPA 900.0/SW846-9310
	Tritium	-44.5 ± 76.4	156	69.4	U	BD	122857-008	EPA 906.0M
TAV-MW2	Americium-241	-0.907 ± 8.41	13.9	6.59	U	BD	122839-006	EPA 901.1
06-Aug-24	Cesium-137	-2.18 ± 3.66	4.92	2.24	U	BD	122839-006	EPA 901.1
	Cobalt-60	-1.46 ± 3.30	5.11	2.20	U	BD	122839-006	EPA 901.1
	Potassium-40	12.9 ± 66.3	63.2	28.1	U	BD	122839-006	EPA 901.1
	Gross Alpha	4.26	NA	NA	NA	None	122839-007	EPA 900.0/SW846-9310
	Gross Beta	6.15 ± 1.34	1.95	0.946			122839-007	EPA 900.0/SW846-9310
	Tritium	-20.0 ± 112	199	94.8	U	BD	122839-008	EPA 906.0M
TAV-MW3	Americium-241	-0.369 ± 4.21	7.38	3.57	U	BD	122809-006	EPA 901.1
26-Jul-24	Cesium-137	0.829 ± 1.66	2.88	1.37	U	BD	122809-006	EPA 901.1
	Cobalt-60	0.795 ± 1.64	3.02	1.39	U	BD	122809-006	EPA 901.1
	Potassium-40	9.97 ± 54.1	27.0	12.3	U	BD	122809-006	EPA 901.1
	Gross Alpha	1.61	NA	NA	NA	None	122809-007	EPA 900.0/SW846-9310
	Gross Beta	6.05 ± 0.841	1.00	0.482			122809-007	EPA 900.0/SW846-9310
	Tritium	-17.4 ± 80.1	157	69.3	U	BD	122809-008	EPA 906.0M

See notes at end of tables.

Table 5B-7 (continued)
Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, and Tritium Results for Waste Characterization Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Activity[a] (pCi/L)	MDA[b] (pCi/L)	Critical Level[c] (pCi/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW4	Americium-241	6.36 ± 13.3	21.4	10.4	U	BD	122851-006	EPA 901.1
13-Aug-24	Cesium-137	0.639 ± 5.99	3.89	1.85	U	BD	122851-006	EPA 901.1
	Cobalt-60	1.70 ± 2.45	4.43	2.05	U	BD	122851-006	EPA 901.1
	Potassium-40	28.2 ± 62.6	35.8	16.3	U	BD	122851-006	EPA 901.1
	Gross Alpha	1.11	NA	NA	NA	None	122851-007	EPA 900.0/SW846-9310
	Gross Beta	3.52 ± 0.843	1.25	0.607		J	122851-007	EPA 900.0/SW846-9310
	Tritium	91.8 ± 101	167	79.4	U	BD	122851-008	EPA 906.0M
TAV-MW5	Americium-241	0.749 ± 8.80	14.9	6.96	U	BD	122818-006	EPA 901.1
30-Jul-24	Cesium-137	2.49 ± 3.38	6.60	2.95	U	BD	122818-006	EPA 901.1
	Cobalt-60	4.24 ± 3.67	7.27	3.12	U	BD	122818-006	EPA 901.1
	Potassium-40	-29.9 ± 49.6	90.1	39.8	U	BD	122818-006	EPA 901.1
	Gross Alpha	3.29	NA	NA	NA	None	122818-007	EPA 900.0/SW846-9310
	Gross Beta	3.82 ± 0.757	1.05	0.504			122818-007	EPA 900.0/SW846-9310
	Tritium	37.6 ± 118	215	94.7	U	BD	122818-008	EPA 906.0M
TAV-MW6	Americium-241	-4.66 ± 10.4	17.9	8.39	U	BD	122855-006	EPA 901.1
14-Aug-24	Cesium-137	2.61 ± 2.69	5.02	2.28	U	BD	122855-006	EPA 901.1
	Cobalt-60	0.329 ± 2.75	5.45	2.37	U	BD	122855-006	EPA 901.1
	Potassium-40	68.5 ± 55.2	52.0	22.4		J	122855-006	EPA 901.1
	Gross Alpha	0.54	NA	NA	NA	None	122855-007	EPA 900.0/SW846-9310
	Gross Beta	6.08 ± 0.995	1.31	0.634			122855-007	EPA 900.0/SW846-9310
	Tritium	51.9 ± 120	207	98.2	U	BD	122855-008	EPA 906.0M
TAV-MW7	Americium-241	0.184 ± 5.20	8.37	4.04	U	BD	122807-006	EPA 901.1
25-Jul-24	Cesium-137	1.81 ± 1.76	2.93	1.38	U	BD	122807-006	EPA 901.1
	Cobalt-60	-1.34 ± 2.35	3.12	1.44	U	BD	122807-006	EPA 901.1
	Potassium-40	4.55 ± 34.6	28.0	12.7	U	BD	122807-006	EPA 901.1
	Gross Alpha	2.70	NA	NA	NA	None	122807-007	EPA 900.0/SW846-9310
	Gross Beta	5.58 ± 0.812	0.985	0.472			122807-007	EPA 900.0/SW846-9310
	Tritium	131 ± 102	155	68.8	U	BD	122807-008	EPA 906.0M
TAV-MW8	Americium-241	-6.20 ± 10.0	14.2	6.59	U	BD	122849-006	EPA 901.1
12-Aug-24	Cesium-137	2.36 ± 3.34	6.54	2.92	U	BD	122849-006	EPA 901.1
	Cobalt-60	-0.431 ± 2.96	5.88	2.42	U	BD	122849-006	EPA 901.1
	Potassium-40	46.9 ± 48.4	55.1	22.3	U	BD	122849-006	EPA 901.1
	Gross Alpha	3.58	NA	NA	NA	None	122849-007	EPA 900.0/SW846-9310
	Gross Beta	5.98 ± 1.33	1.94	0.939			122849-007	EPA 900.0/SW846-9310
	Tritium	-26.3 ± 115	205	97.7	U	BD	122849-008	EPA 906.0M

See notes at end of tables.

Table 5B-7 (continued)
Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, and Tritium Results for Waste Characterization Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Activity[a] (pCi/L)	MDA[b] (pCi/L)	Critical Level[c] (pCi/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW9	Americium-241	0.682 ± 17.3	26.0	12.6	U	BD	122804-006	EPA 901.1
24-Jul-24	Cesium-137	0.413 ± 2.01	3.54	1.68	U	BD	122804-006	EPA 901.1
	Cobalt-60	-1.51 ± 2.16	3.50	1.61	U	BD	122804-006	EPA 901.1
	Potassium-40	32.3 ± 29.2	45.5	21.3	U	BD	122804-006	EPA 901.1
	Gross Alpha	1.12	NA	NA	NA	None	122804-007	EPA 900.0/SW846-9310
	Gross Beta	5.94 ± 1.02	1.47	0.713			122804-007	EPA 900.0/SW846-9310
	Tritium	21.7 ± 86.6	158	70.1	U	BD	122804-008	EPA 906.0M
TAV-MW10	Americium-241	4.21 ± 8.11	14.2	6.87	U	BD	122859-006	EPA 901.1
15-Aug-24	Cesium-137	1.04 ± 1.88	3.33	1.58	U	BD	122859-006	EPA 901.1
	Cobalt-60	-0.237 ± 1.77	3.24	1.49	U	BD	122859-006	EPA 901.1
	Potassium-40	-50.3 ± 45.9	43.1	20.2	U	BD	122859-006	EPA 901.1
	Gross Alpha	1.00	NA	NA	NA	None	122859-007	EPA 900.0/SW846-9310
	Gross Beta	5.45 ± 0.981	1.35	0.654			122859-007	EPA 900.0/SW846-9310
	Tritium	-20.1 ± 121	215	102	U	BD	122859-008	EPA 906.0M
TAV-MW11	Americium-241	9.71 ± 10.1	15.5	7.27	U	BD	122845-006	EPA 901.1
08-Aug-24	Cesium-137	5.94 ± 4.73	5.24	2.32	X	R	122845-006	EPA 901.1
	Cobalt-60	0.204 ± 2.93	5.87	2.46	U	BD	122845-006	EPA 901.1
	Potassium-40	43.2 ± 60.2	66.9	28.7	U	BD	122845-006	EPA 901.1
	Gross Alpha	2.84	NA	NA	NA	None	122845-007	EPA 900.0/SW846-9310
	Gross Beta	5.23 ± 0.815	1.06	0.508			122845-007	EPA 900.0/SW846-9310
	Tritium	69.3 ± 122	207	98.4	U	BD	122845-008	EPA 906.0M
TAV-MW12	Americium-241	2.73 ± 8.28	12.9	6.08	U	BD	122843-006	EPA 901.1
07-Aug-24	Cesium-137	-0.0515 ± 2.70	4.99	2.24	U	BD	122843-006	EPA 901.1
	Cobalt-60	0.226 ± 2.69	5.44	2.33	U	BD	122843-006	EPA 901.1
	Potassium-40	0.630 ± 46.4	40.2	16.2	U	BD	122843-006	EPA 901.1
	Gross Alpha	1.74	NA	NA	NA	None	122843-007	EPA 900.0/SW846-9310
	Gross Beta	6.48 ± 0.907	1.11	0.532			122843-007	EPA 900.0/SW846-9310
	Tritium	104 ± 124	206	97.9	U	BD	122843-008	EPA 906.0M
TAV-MW13	Americium-241	9.38 ± 13.6	24.7	11.6	U	BD	122813-006	EPA 901.1
29-Jul-24	Cesium-137	1.49 ± 2.73	5.39	2.39	U	BD	122813-006	EPA 901.1
	Cobalt-60	1.50 ± 3.40	7.06	3.06	U	BD	122813-006	EPA 901.1
	Potassium-40	-7.84 ± 46.8	88.8	39.7	U	BD	122813-006	EPA 901.1
	Gross Alpha	3.19	NA	NA	NA	None	122813-007	EPA 900.0/SW846-9310
	Gross Beta	5.28 ± 0.813	1.02	0.491			122813-007	EPA 900.0/SW846-9310
	Tritium	-17.3 ± 80.7	158	69.8	U	BD	122813-008	EPA 906.0M

See notes at end of tables.

Table 5B-7 (concluded)
Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, and Tritium Results for Waste Characterization Samples, Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Activity[a] (pCi/L)	MDA[b] (pCi/L)	Critical Level[c] (pCi/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
TAV-MW14	Americium-241	-4.09 ± 13.3	21.7	10.1	U	BD	122847-006	EPA 901.1
09-Aug-24	Cesium-137	0.582 ± 2.88	5.51	2.45	U	BD	122847-006	EPA 901.1
	Cobalt-60	2.81 ± 3.60	7.09	3.07	U	BD	122847-006	EPA 901.1
	Potassium-40	46.2 ± 63.0	52.8	21.6	U	BD	122847-006	EPA 901.1
	Gross Alpha	4.14	NA	NA	NA	None	122847-007	EPA 900.0/SW846-9310
	Gross Beta	5.27 ± 0.875	1.18	0.567			122847-007	EPA 900.0/SW846-9310
	Tritium	-21.6 ± 115	205	97.7	U	BD	122847-008	EPA 906.0M
TAV-MW15	Americium-241	4.84 ± 15.7	28.1	13.6	U	BD	122800-006	EPA 901.1
23-Jul-24	Cesium-137	0.911 ± 1.96	3.52	1.66	U	BD	122800-006	EPA 901.1
	Cobalt-60	-2.02 ± 4.45	4.81	2.24	U	BD	122800-006	EPA 901.1
	Potassium-40	-32.0 ± 48.1	63.4	30.0	U	BD	122800-006	EPA 901.1
	Gross Alpha	2.13	NA	NA	NA	None	122800-007	EPA 900.0/SW846-9310
	Gross Beta	5.80 ± 1.17	1.66	0.801			122800-007	EPA 900.0/SW846-9310
	Tritium	-14.8 ± 81.8	159	70.4	U	BD	122800-008	EPA 906.0M
TAV-MW16	Americium-241	12.3 ± 17.5	22.0	10.3	U	BD	122823-006	EPA 901.1
31-Jul-24	Cesium-137	-0.715 ± 2.97	5.33	2.37	U	BD	122823-006	EPA 901.1
	Cobalt-60	2.34 ± 3.27	6.94	3.00	U	BD	122823-006	EPA 901.1
	Potassium-40	27.1 ± 73.8	55.8	23.1	U	BD	122823-006	EPA 901.1
	Gross Alpha	4.56	NA	NA	NA	None	122823-007	EPA 900.0/SW846-9310
	Gross Beta	5.73 ± 1.17	1.60	0.769			122823-007	EPA 900.0/SW846-9310
	Tritium	-50.3 ± 103	210	92.7	U	BD	122823-008	EPA 906.0M
TAV-MW17	Americium-241	-3.72 ± 8.89	14.1	6.57	U	BD	122827-006	EPA 901.1
02-Aug-24	Cesium-137	1.06 ± 3.54	6.23	2.77	U	BD	122827-006	EPA 901.1
	Cobalt-60	-1.48 ± 3.58	6.51	2.74	U	BD	122827-006	EPA 901.1
	Potassium-40	10.3 ± 57.9	63.3	26.4	U	BD	122827-006	EPA 901.1
	Gross Alpha	2.65	NA	NA	NA	None	122827-007	EPA 900.0/SW846-9310
	Gross Beta	4.78 ± 1.40	2.15	1.04		J	122827-007	EPA 900.0/SW846-9310
	Tritium	15.2 ± 83.4	155	68.1	U	BD	122827-008	EPA 906.0M

See notes at end of tables.

Table 5B-8
Summary of Field Water Quality Parameter Measurements[h], Technical Area-V Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Sample Date	Temperature (^{0}C)	Specific Conductivity (µmho/cm)	Oxidation Reduction Potential (mV)	pH	Turbidity (NTU)	Dissolved Oxygen (% Sat)	Dissolved Oxygen (mg/L)
LWDS-MW1	12-Feb-24	16.64	321.05	126.2	6.45	0.09	106.01	8.48
TAV-MW2	01-Feb-24	18.23	713.01	97.4	7.32	0.27	83.85	6.40
TAV-MW4	07-Feb-24	17.22	491.94	79.0	7.55	0.06	87.21	6.71
TAV-MW6	08-Feb-24	18.0	632	181.4	7.29	5.00	29.9	2.82
TAV-MW8	06-Feb-24	17.30	564.16	81.2	7.43	0.73	79.50	6.17
TAV-MW10	13-Feb-24	18.5	556	164.1	7.38	0.09	79.5	7.43
TAV-MW11	02-Feb-24	18.1	548	176.2	7.43	0.02	71.9	6.78
TAV-MW12	31-Jan-24	18.0	650	170.1	7.25	0.94	70.9	6.70
TAV-MW14	05-Feb-24	19.0	595	181.7	7.27	0.43	71.2	6.58
TAV-MW16	26-Jan-24	19.17	811.22	111.0	7.18	0.02	53.79	4.01
TAV-MW17	29-Jan-24	19.40	450.40	94.7	7.77	0.14	82.23	6.19
LWDS-MW1	19-Aug-24	26.50	489.00	122.5	7.01	1.45	110.42	7.03
TAV-MW2	06-Aug-24	23.86	800.13	139.5	7.42	1.72	84.15	5.92
TAV-MW3	26-Jul-24	22.25	671.82	79.7	7.45	0.72	76.68	5.43
TAV-MW4	13-Aug-24	20.62	582.55	137.4	7.55	0.86	85.33	6.29
TAV-MW5	30-Jul-24	25.69	557.90	107.1	7.78	5.55	92.37	6.18
	01-Aug-24	25.81	557.84	120.3	7.78	2.67	90.33	6.05
TAV-MW6	14-Aug-24	20.8	796	109.3	7.29	2.17	35.1	3.14
TAV-MW7	25-Jul-24	21.9	674	159.8	7.23	0.37	14.6	1.27
TAV-MW8	12-Aug-24	23.05	678.40	126.3	7.48	2.83	88.01	6.20
TAV-MW9	24-Jul-24	21.43	707.86	63.8	7.27	1.60	11.64	0.84
TAV-MW10	15-Aug-24	21.1	698	176.6	7.35	0.18	83.0	7.41
TAV-MW11	08-Aug-24	22.2	653	126.2	7.34	0.27	76.8	6.69
TAV-MW12	07-Aug-24	24.9	779	112.0	7.18	0.83	72.1	5.97
TAV-MW13	29-Jul-24	22.84	576.80	59.4	7.48	0.37	29.11	2.06
TAV-MW14	09-Aug-24	23.1	743	170.8	7.25	0.44	77.2	6.60
TAV-MW15	23-Jul-24	21.37	889.77	77.2	7.26	0.44	68.51	4.99
TAV-MW16	31-Jul-24	22.68	953.30	132.4	7.25	0.21	57.36	4.05
TAV-MW17	02-Aug-24	21.72	490.49	127.8	7.81	0.50	82.80	6.06

See notes at end of tables.

Notes for Technical Area-V Groundwater Area of Concern Analytical Results Tables

% = percent
CFR = Code of Federal Regulations
EPA = U.S. Environmental Protection Agency
ID = identifier
µg/L = micrograms per liter
mg/L = milligrams per liter
mrem/yr = millirem per year
No. = number
pCi/L = picocuries per liter
TAL = Target Analyte List

[a]Result or Activity
Result applies to Tables 5B-1 and 5B-3 through 5B-6. Activity applies to Table 5B-7.
Activity = Gross alpha activity measurements were corrected by subtracting out the total uranium activity (40 CFR Part 141). Activities of zero or less are considered to be not detected.
Bold = Value exceed the established MCL.
ND = not detected (at MDL)

[b]MDL or MDA
The MDL applies to Tables 5B-1 through 5B-6. MDA applies to Table 5B-7.
MDA = The minimal detectable activity or minimum measured activity in a sample required to ensure a 95% probability that the measured activity is accurately quantified above the critical level.
MDL = Method detection limit. The minimum concentration or activity that can be measured and reported with 99% confidence that the analyte is greater than zero, analyte is matrix specific.
NA = Not applicable for gross alpha activities. The MDA could not be calculated as the gross alpha activity was corrected by subtracting the total uranium activity.

[c]PQL or Critical Level
The PQL applies to Tables 5B-1 and 5B-3 through 5B-6. Critical level applies to Table 5B-7.
Critical Level = The minimum activity that can be measured and reported with 99% confidence that the analyte is greater than zero, analyte is matrix specific.
NA = Not applicable for gross alpha activities. The critical level could not be calculated as the gross alpha activity was corrected by subtracting the total uranium activity.
PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.

[d]MCL
MCL = Maximum contaminant level. Established by the EPA Office of Water, National Primary Drinking Water Standards (EPA, March 2018).
NE = not established

[e]Laboratory Qualifier
If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.
B = The analyte was found in the blank above the effective MDL.
J = Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL.
N = Results associated with a spike analysis that was outside control limits.
NA = not applicable
U = Analyte is absent or below the MDL.
X = Uncertain identification for gamma spectroscopy.

Notes for Technical Area-V Groundwater Area of Concern Analytical Results Tables (concluded)

[f]Validation Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

BD = Below detection limit as used in radiochemistry to identify results that are not statistically different from zero.
J = The associated value is an estimated quantity.
J- = The associated numerical value is an estimated quantity with a suspected negative bias.
None = No data validation for corrected gross alpha activity.
U = The analyte was analyzed for but was not detected. The associated numerical value is the sample quantitation limit.
UJ = The analyte was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R = The data are unusable (compound may or may not be present). Resampling and reanalysis are necessary for verification.

[g]Analytical Method

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EML = Environmental Measurements Laboratory
HASL = Health and Safety Laboratory
SM = Standard Method
SW = Solid Waste

[h]Field Water Quality Measurements

Field measurements collected prior to sampling.

˚C = degrees Celsius
% Sat = percent saturation
µmho/cm = micromhos per centimeter
mg/L = milligrams per liter
mV = millivolts
NTU = nephelometric turbidity units
pH = potential of hydrogen (negative logarithm of the hydrogen ion concentration)

Attachment 5C
Technical Area-V Groundwater Area of Concern Plots

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Attachment 5C Plots

Figure 5C-1 Trichloroethene Concentrations, LWDS-MW1 ..... 5C-5
Figure 5C-2 Trichloroethene Concentrations, TAV-MW4 ..... 5C-6
Figure 5C-3 Trichloroethene Concentrations, TAV-MW6 ..... 5C-7
Figure 5C-4 Trichloroethene Concentrations, TAV-MW8 ..... 5C-8
Figure 5C-5 Trichloroethene Concentrations, TAV-MW10 ..... 5C-9
Figure 5C-6 Nitrate Plus Nitrite Concentrations, LWDS-MW1 ..... 5C-10
Figure 5C-7 Nitrate Plus Nitrite Concentrations, TAV-MW10 ..... 5C-11

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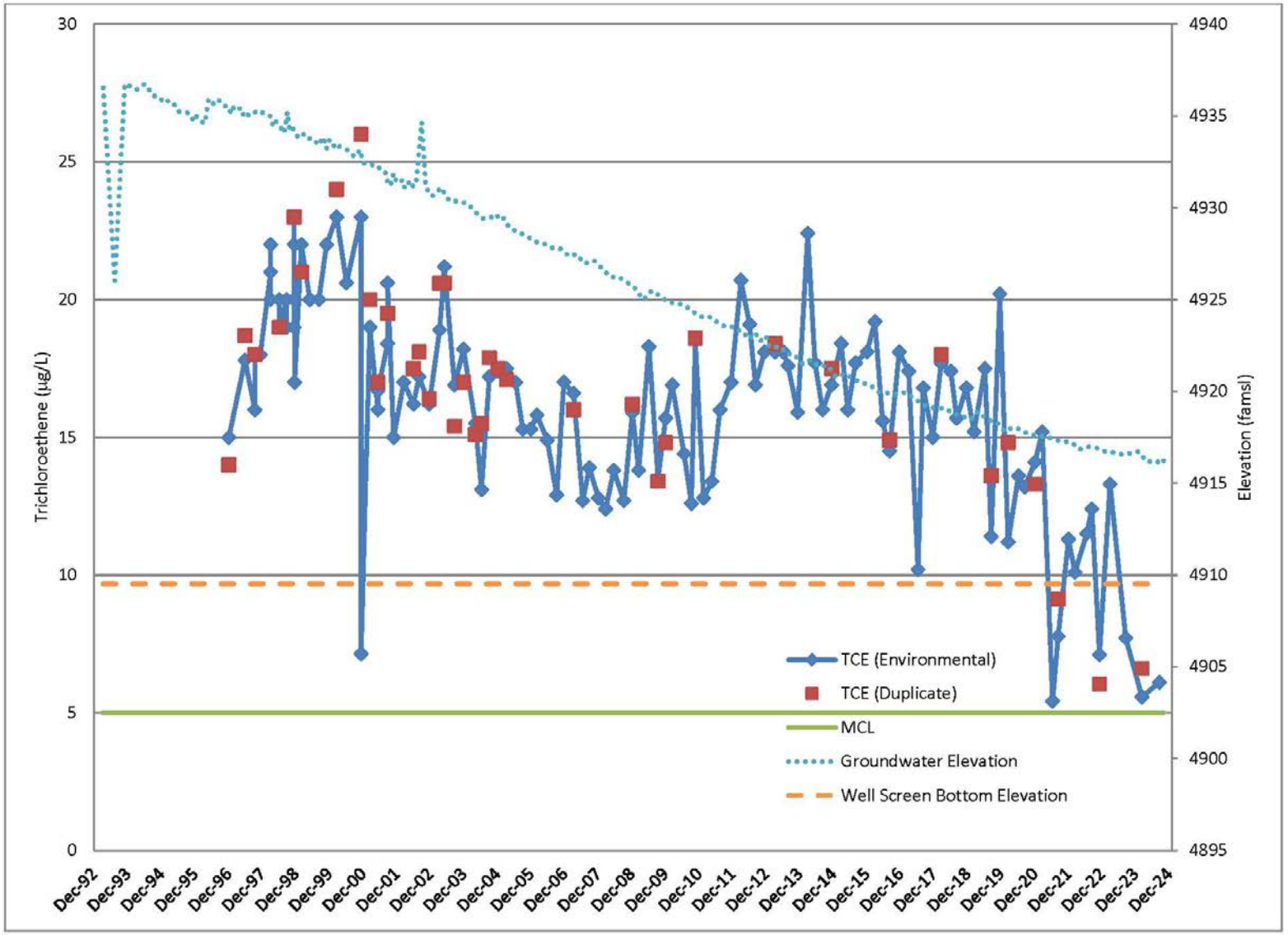


Figure 5C-1
Trichloroethene Concentrations, LWDS-MW1

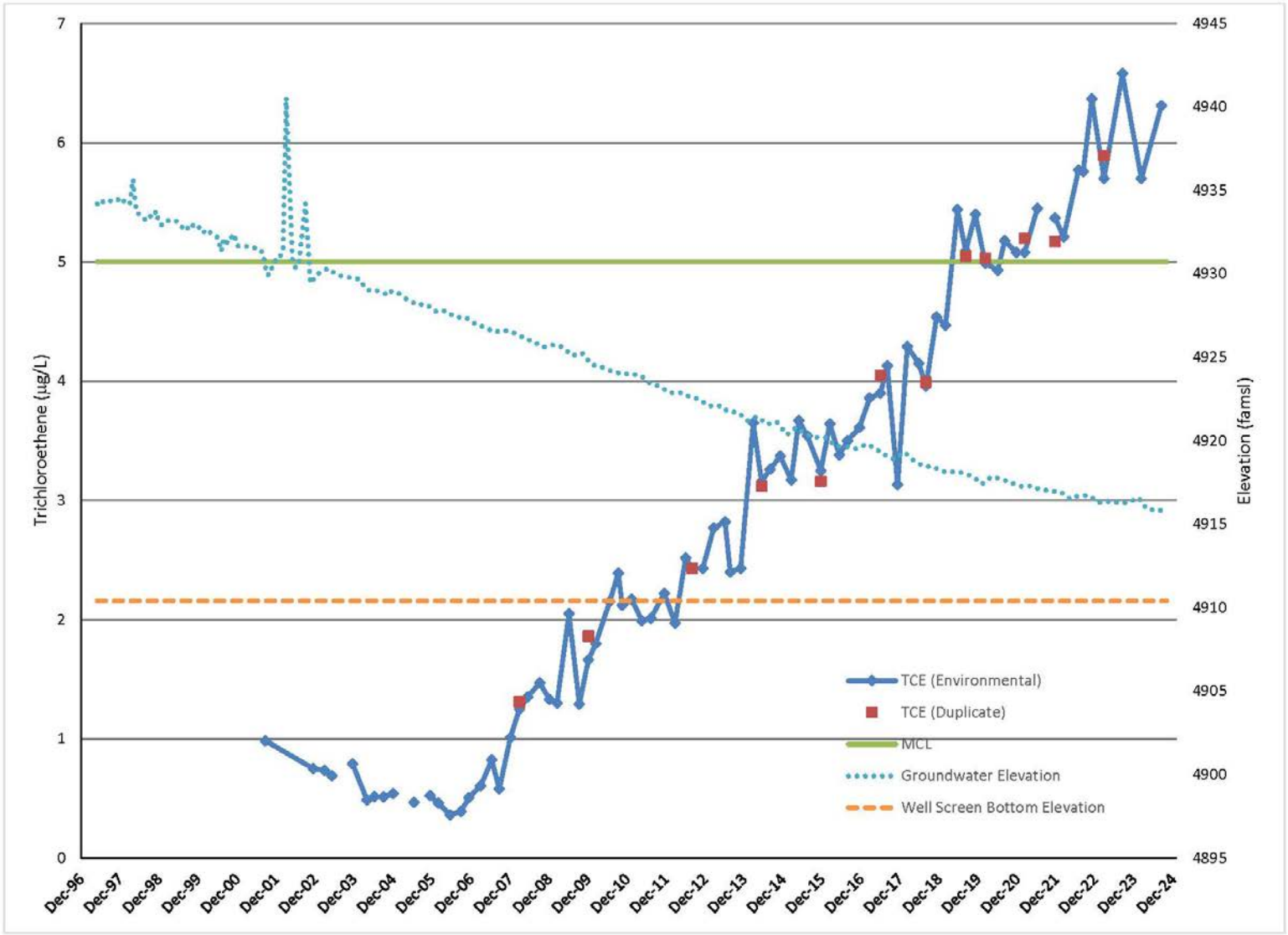


Figure 5C-2
Trichloroethene Concentrations, TAV-MW4

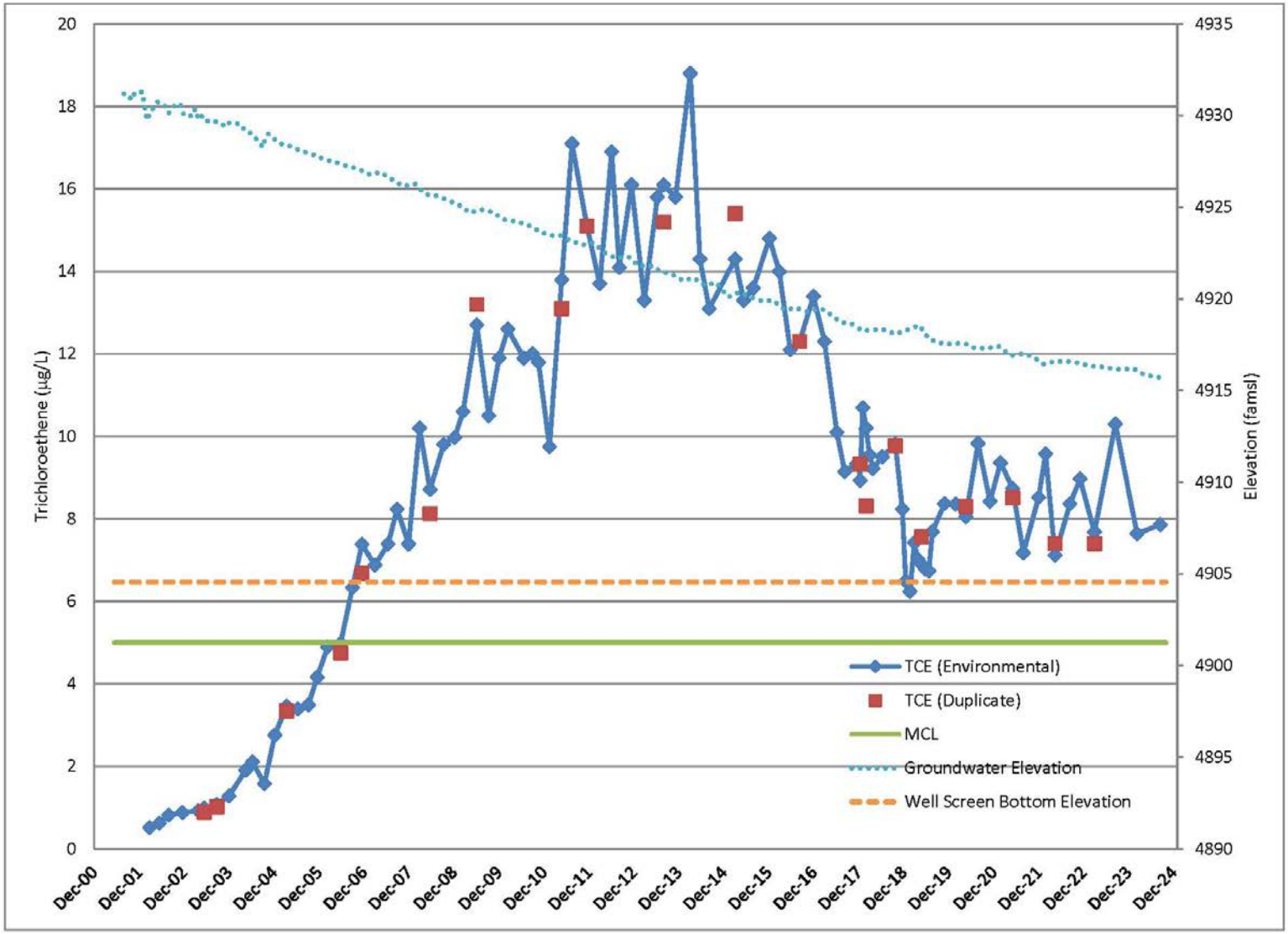


Figure 5C-3
Trichloroethene Concentrations, TAV-MW6

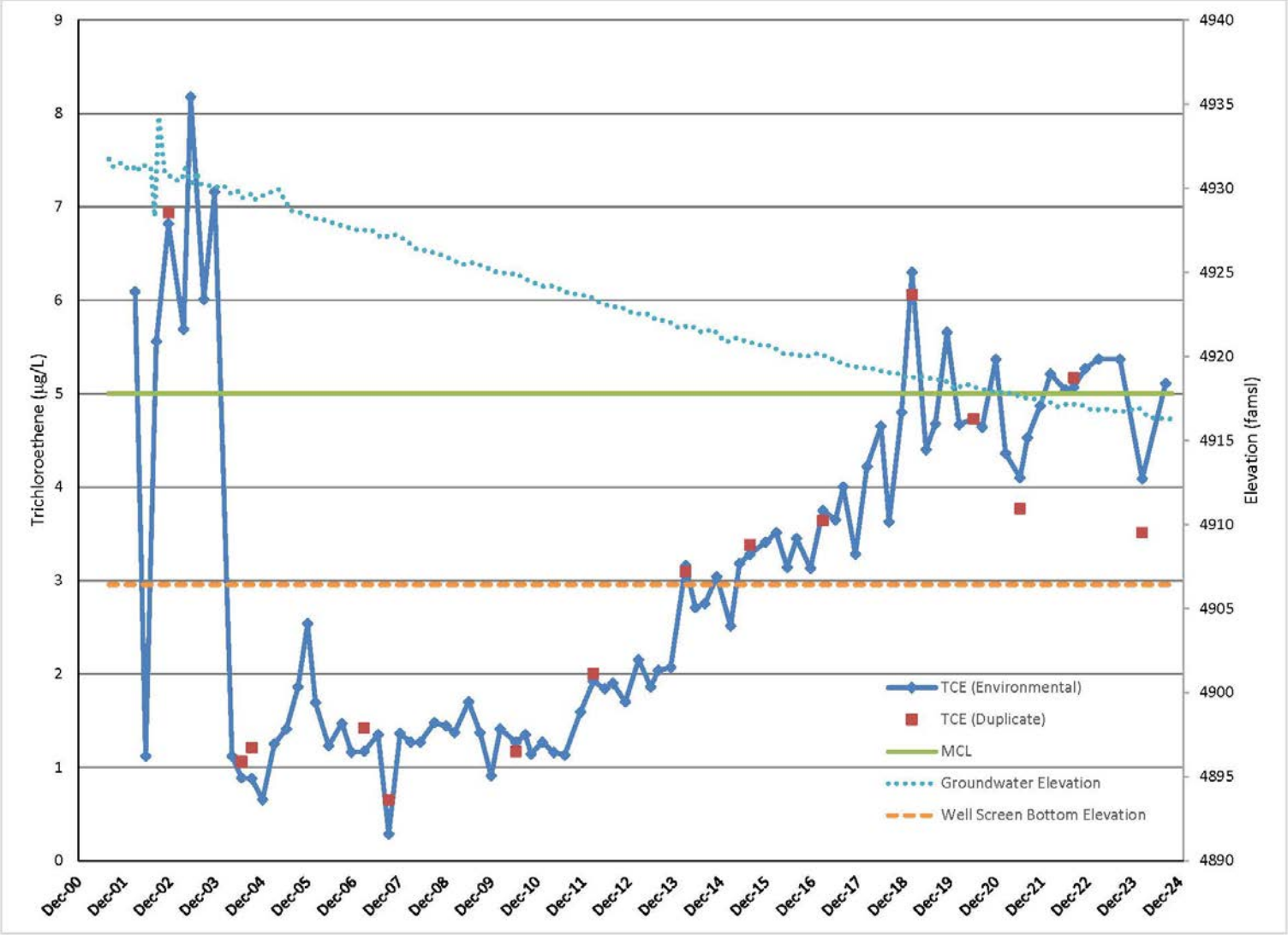


Figure 5C-4
Trichloroethene Concentrations, TAV-MW8

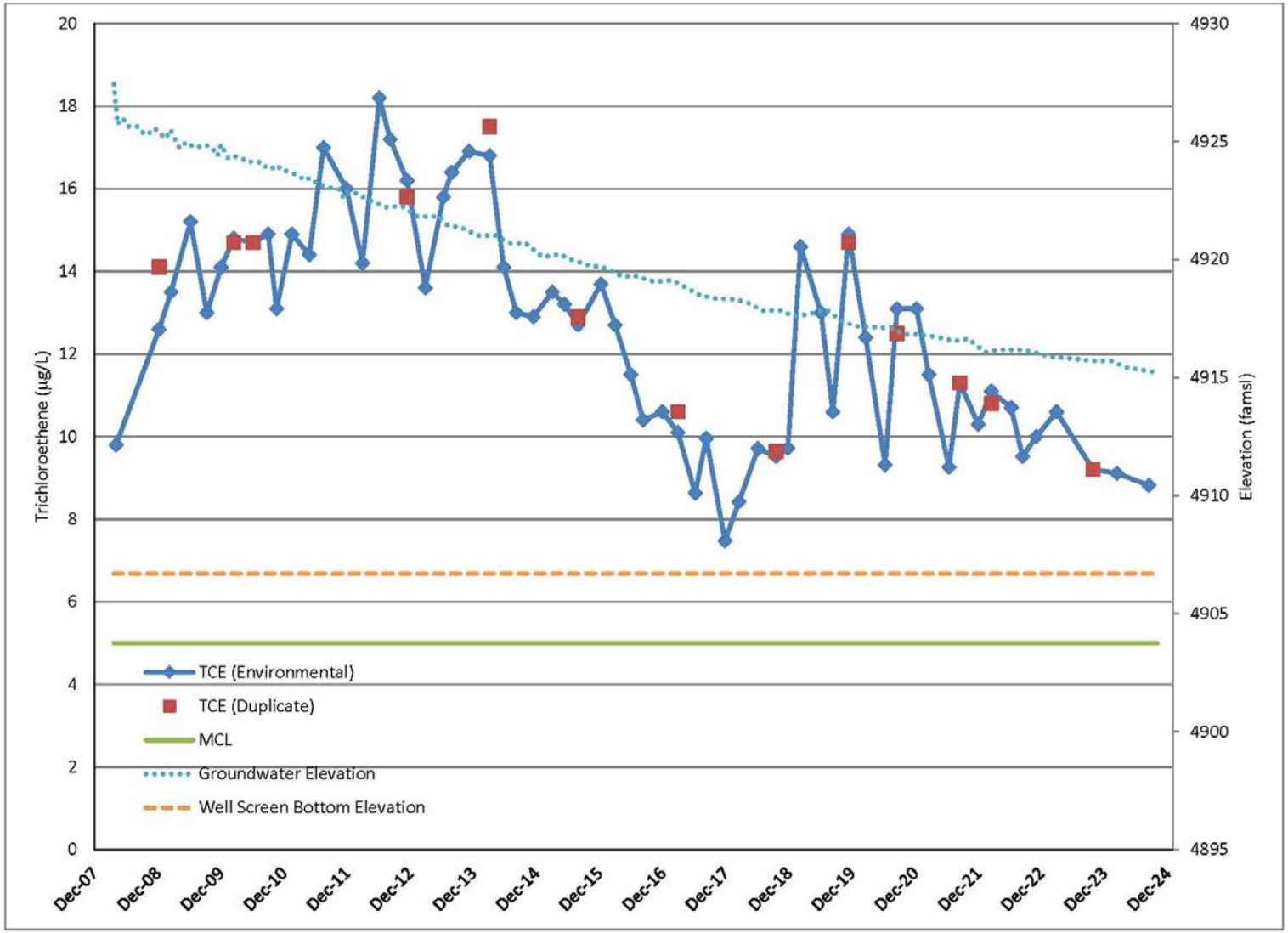


Figure 5C-5
Trichloroethene Concentrations, TAV-MW10

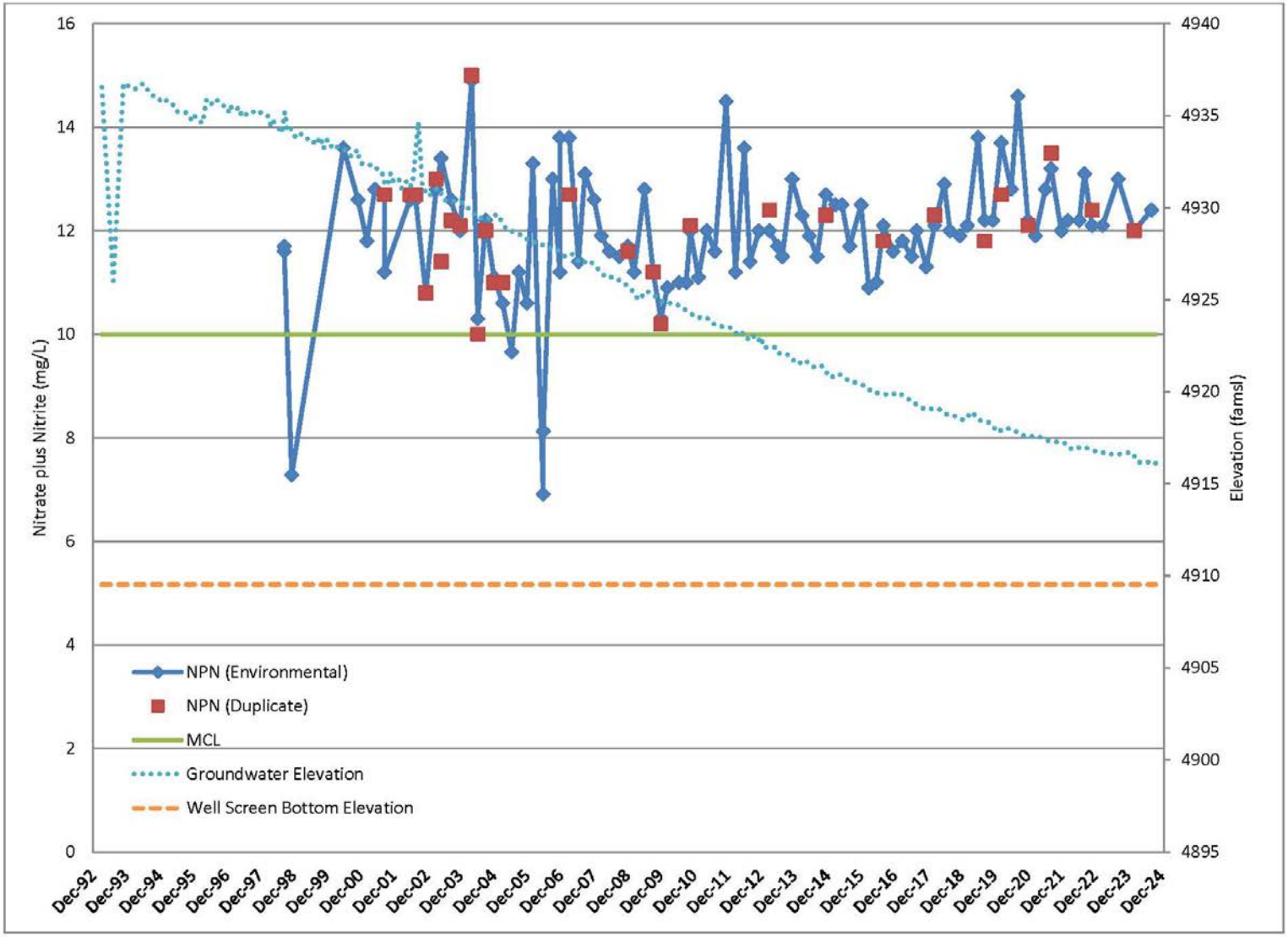


Figure 5C-6
Nitrate Plus Nitrite Concentrations, LWDS-MW1

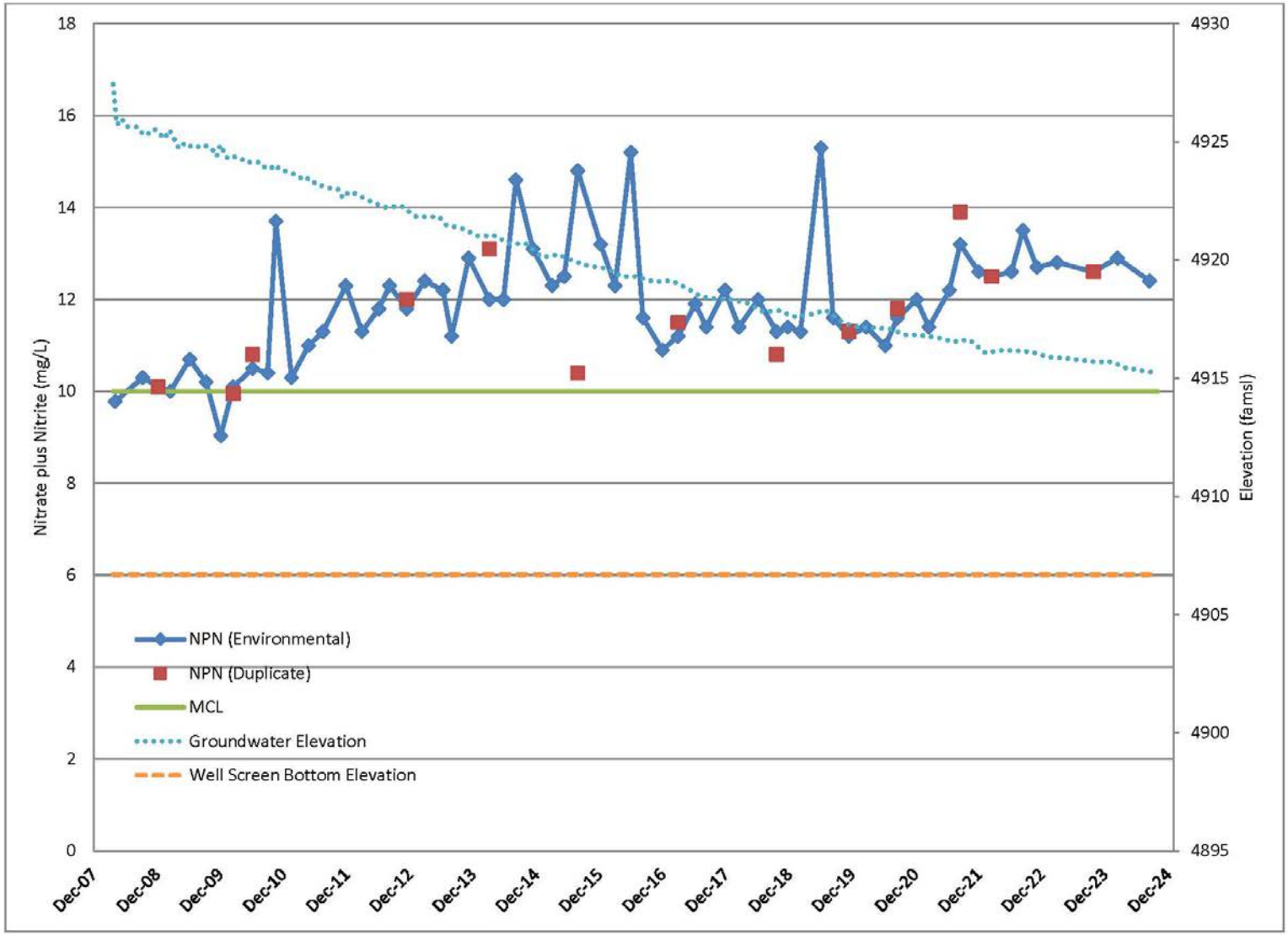


Figure 5C-7
Nitrate Plus Nitrite Concentrations, TAV-MW10

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Attachment 5D
Technical Area-V Groundwater Area of Concern Hydrographs

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Attachment 5D Hydrographs

Figure 5D-1 Technical Area-V Groundwater Area of Concern Wells (1 of 4) 5D-5
Figure 5D-2 Technical Area-V Groundwater Area of Concern Wells (2 of 4) 5D-6
Figure 5D-3 Technical Area-V Groundwater Area of Concern Wells (3 of 4) 5D-7
Figure 5D-4 Technical Area-V Groundwater Area of Concern Wells (4 of 4) 5D-8

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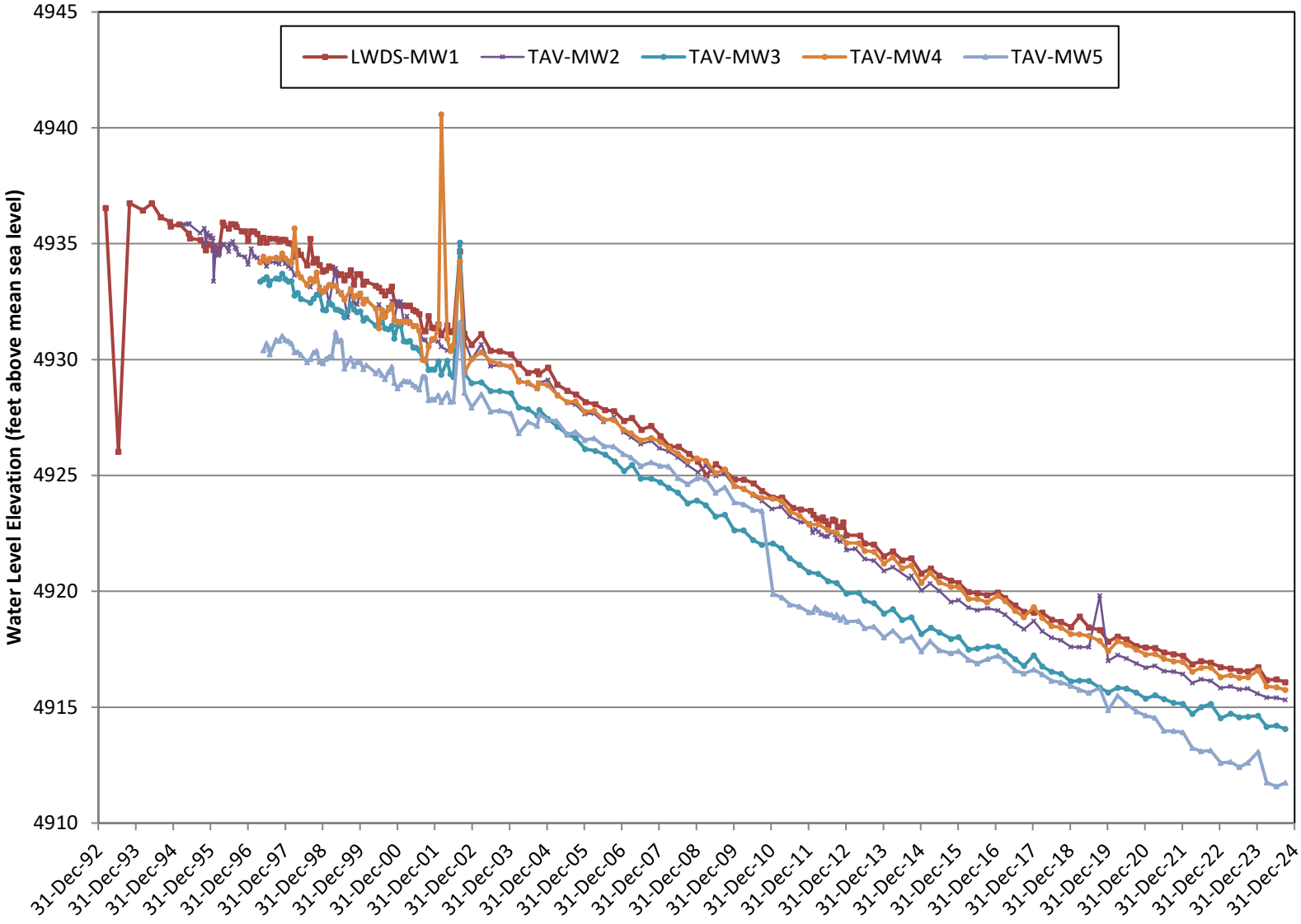


Figure 5D-1
Technical Area-V Groundwater Area of Concern Wells (1 of 4)

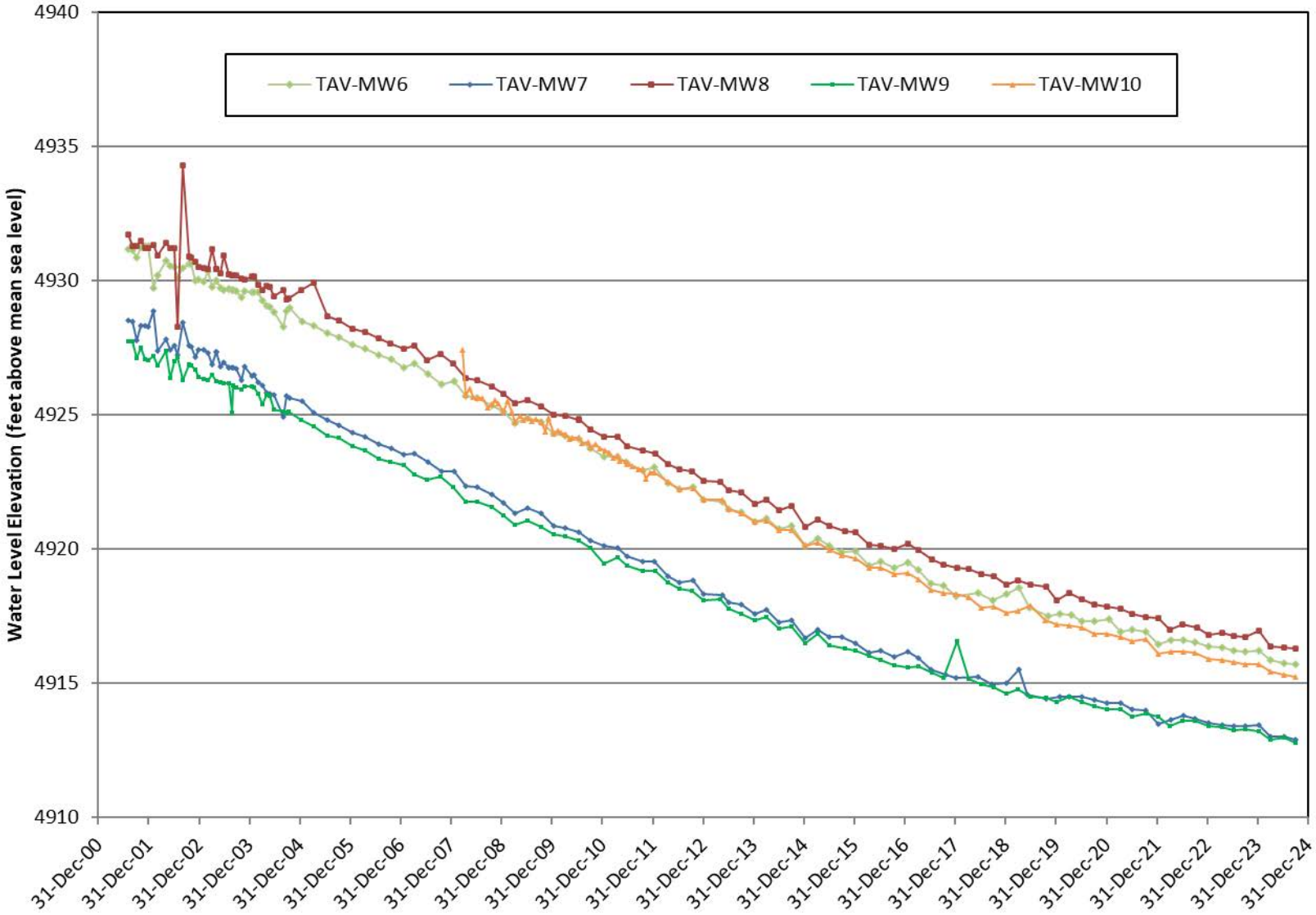


Figure 5D-2
Technical Area-V Groundwater Area of Concern Wells (2 of 4)



Figure 5D-3
Technical Area-V Groundwater Area of Concern Wells (3 of 4)

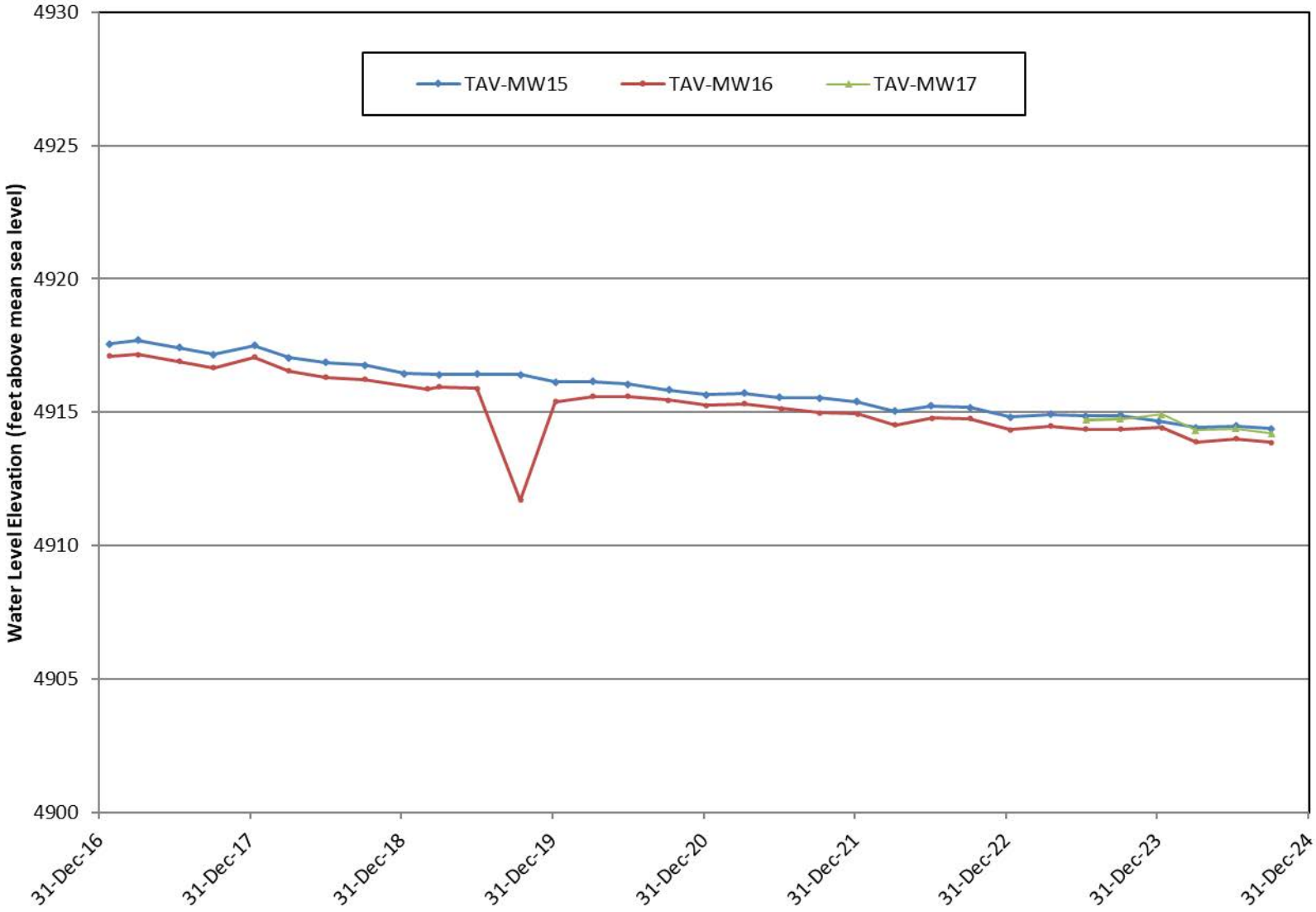


Figure 5D-4
Technical Area-V Groundwater Area of Concern Wells (4 of 4)

Chapter 5.0
Technical Area-V Groundwater Area of Concern References

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6.0 Tijeras Arroyo Groundwater Area of Concern

6.1 Introduction

This chapter summarizes the calendar year (CY) 2024 Tijeras Arroyo Groundwater (TAG) Area of Concern (AOC) groundwater monitoring activities and results.

Nitrate concentrations in the Perched Groundwater System (PGWS) in the TAG AOC currently exceed the U.S. Environmental Protection Agency maximum contaminant level (EPA MCL) and the New Mexico Water Quality Control Commission maximum allowable concentration (MAC) of 10 mg/L (EPA, March 2018; NMWQCC, December 2018). Because the EPA MCL and MAC for nitrate are the same, the term EPA MCL is used in this chapter and its attachments for both regulatory standards.

The *Compliance Order on Consent Pursuant to the New Mexico Hazardous Waste Act 74-4-10: Sandia National Laboratories Consent Order* (Consent Order) (NMED, April 2004) identifies the TAG AOC as an area of groundwater contamination requiring characterization and corrective action. In accordance with the Consent Order process, U.S Department of Energy National Nuclear Security Administration (DOE/NNSA) and Sandia National Laboratories, New Mexico (SNL/NM) personnel submitted the *Tijeras Arroyo Groundwater Current Conceptual Model and Corrective Measures Evaluation Report* (TAG CCM/CME Report) (SNL/NM, December 2016) to the New Mexico Environment Department (NMED) in 2016, followed by the *Revised Tijeras Arroyo Groundwater Current Conceptual Model and Corrective Measures Evaluation Report* (Revised TAG CCM/CME Report) (SNL/NM, February 2018) in 2018. The Revised TAG CCM/CME Report proposed monitored natural attenuation (MNA) as the preferred remedy for the elevated nitrate concentrations in the PGWS. In 2022, the NMED selected MNA as the final remedy for the TAG AOC and issued a Fact Sheet/Statement of Basis (NMED, August 2022). After the public comment process was completed, the NMED approved the Revised TAG CCM/CME Report in 2023 (NMED, January 2023). Nitrate is the constituent of concern (COC) for the TAG AOC (SNL/NM, February 2018).

TAG AOC groundwater monitoring began in 1992. The TAG AOC overlies two primary water-bearing zones of interest: the PGWS and the Regional Aquifer. The sources of nitrate associated with historical SNL/NM operations (wastewater outfalls and septic waste leach fields/seepage pits) that impacted the PGWS are no longer in operation. The greatest volume of discharge occurred at Solid Waste Management Unit (SWMU) 46, the Old Acid Waste Line, which operated from 1948 to 1974. Discharges also occurred from 1947 to 1992 at nine smaller Technical Area (TA)-II SWMUs at what is collectively known as the TA-II Discharges site. All 47 of the surface-soil SWMUs located in the TAG AOC have Corrective Action Complete status (SNL/NM, February 2018).

The *Tijeras Arroyo Groundwater Corrective Measures Implementation Plan* (TAG CMI Plan) (SNL/NM, June 2023a) submitted to the NMED in 2023 addressed the Consent Order-required elements and established a list of monitoring wells to be sampled using an optimized sampling frequency. In its October 26, 2023 approval-with-modification letter for the TAG CMI Plan (NMED, October 2023b), the NMED requested that two existing PGWS monitoring wells (TA1-W-07 and TA2-NW1-325) be added to the sampling plan. However, well capacity tests conducted in November 2023 demonstrated that only TA2-NW1-325 was suitable for sampling (SNL/NM, July 2024). Therefore, only TA2-NW1-325 was added to the sampling plan in the *Tijeras Arroyo Groundwater Corrective Measures Implementation Plan (Revised)* (TAG CMI Plan [Revised]) (SNL/NM, June 2023b) submitted to the NMED in January 2024 (DOE, January 2024). The NMED approved the revised plan in 2024 (NMED, March 2024).

Implementation of best management practices for the MNA final remedy began voluntarily in January 2024. The best management practices include quarterly water level measurements at all TAG AOC monitoring wells, semiannual sampling of the PGWS monitoring wells, annual sampling of the Regional Aquifer monitoring wells, and analyses for nitrate. Implementation of the MNA final remedy will begin in 2025.

6.1.1 Location

As Figure 6-1 shows, the TAG AOC covers approximately 1.82 mi^2 and spans three TAs (TA-I, TA-II, and TA-IV). The Consent Order did not define the areal extent for the TAG AOC. The first depiction of the areal extent was presented in a 2004 work plan (SNL/NM, July 2004) that the NMED subsequently approved (NMED, October 2004). Kirtland Air Force Base (KAFB) operations use numerous facilities and properties along the northern, western, southern, and southeastern boundaries of TA-I, TA-II, and TA-IV. The area located along the northern and western boundaries of the three TAs contains base housing, office buildings, a fire station, training schools, machine workshops, storage yards, a detention facility, an electromagnetic research facility, and the Former KAFB Sewage Lagoons. Bordering the southern and southeastern edges of the TAG AOC are undeveloped open spaces, an active landfill, closed landfills, emergency response training areas, and the KAFB Tijeras Arroyo Golf Course. City of Albuquerque (COA) residential areas are located along the northern boundary of KAFB. The closed COA Eubank Landfill is located near the northeast corner of the TAG AOC (Nelson, June 1997). A large-diameter sanitary sewer line operated by the Albuquerque Bernalillo County Water Utility Authority (ABCWUA) extends along the eastern and southern edges of the TAG AOC.

6.1.2 Site History

The facilities in TA-I, TA-II, and TA-IV were built on land that had been previously developed by commercial airline operators and to a greater extent by the military (Van Citters and Bisson, June 2003). In 1949, the independent Sandia Laboratory was established in TA-I and TA-II. Construction of TA-IV began in 1977. Over the years, operations in the three TAs have evolved to include a wide variety of research and development activities, including weapons design, component production, high-performance computing, and energy research programs.

The SWMUs that have impacted groundwater quality in the TAG AOC are SWMU 46 (Old Acid Waste Line Outfall) located on the southern edge of the TAG AOC and the TA-II Discharges site consisting of nine SWMUs located near the center of the TAG AOC.

The original sources of nitrate from historical SNL/NM operations (wastewater outfalls and septic waste leach fields/seepage pits) are no longer in operation. The highest volume discharge (SWMU 46) ended in 1974 and all TA-II discharges ended by 1992. Artificial driving forces for downward migration of nitrate through the vadose zone to groundwater no longer exist (SNL/NM, February 2018).

6.1.3 Monitoring History

Since 1992, SNL/NM Environmental Restoration Operations has conducted numerous environmental and groundwater investigations in the TAG AOC. The historical timeline (Attachment 6A, Table 6A-1) lists the field investigations. Most of the investigations have been site-specific investigations conducted in support of SWMU assessments involving potential soil contamination. Where required, contaminated soil and weapons/construction debris were excavated and removed.

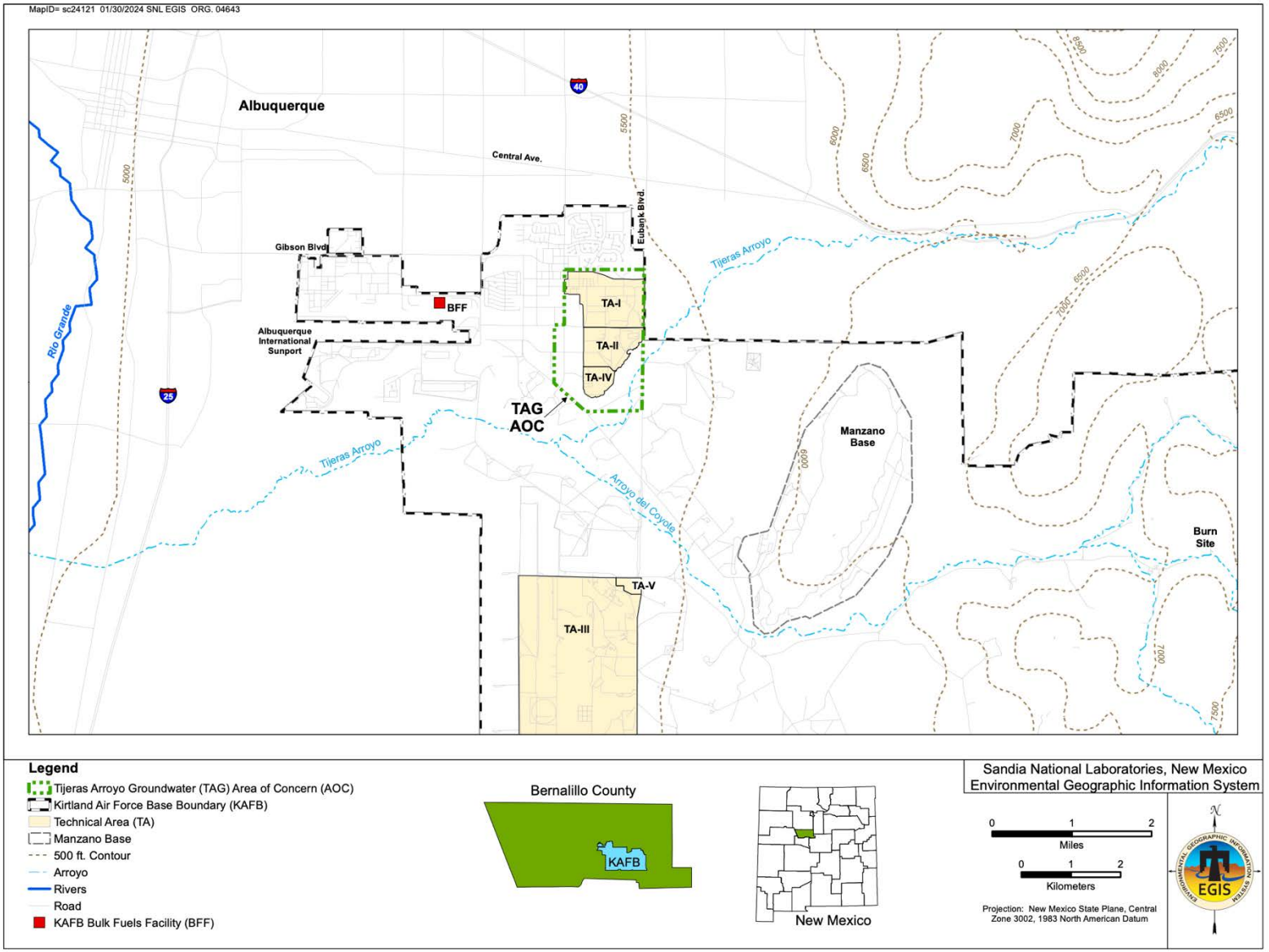


Figure 6-1
Location of the Tijeras Arroyo Groundwater Area of Concern

The KAFB Environmental Restoration Program (ERP) and the COA Environmental Health Department (EHD) have also conducted groundwater investigations near the TAG AOC. Their initial findings were incorporated into the *Tijeras Arroyo Groundwater Investigation Report* (SNL/NM, November 2005). Since then, KAFB has issued nitrate abatement reports (KAFB, December 2015, January 2019, January 2025) describing nitrate release sites and groundwater monitoring data.

Since 1992, groundwater quality in the TAG AOC has been evaluated as part of the TA-II SWMU investigations with the installation of monitoring wells in the central part of the TAG AOC. The PGWS was encountered at a depth of approximately 320 ft bgs. The Regional Aquifer was present at approximately 500 ft bgs. Subsequent drilling activities outside of TA-II identified that a localized Merging Zone of limited lateral extent was present between the PGWS and the Regional Aquifer near Powerline Road. The Conceptual Site Model (CSM) (Section 6.1.5) describes the hydrogeologic setting in greater detail.

6.1.4 Current Monitoring Well Network

Figure 6-2 shows the current TAG AOC monitoring well network. In CY 2024, the water levels at 25 TAG AOC monitoring wells were measured quarterly and groundwater samples were collected from 19 TAG AOC monitoring wells either semiannually or annually (Table 6-1). The previous sampling frequencies were quarterly, semiannual, and annual. Under the TAG CMI Plan (Revised), quarterly sampling is no longer required and 11 PGWS monitoring wells and 8 Regional Aquifer monitoring wells are scheduled for semiannual and annual sampling, respectively.

Table 6-1
Groundwater Monitoring Conducted in the Tijeras Arroyo Groundwater Area of Concern in Calendar Year 2024 in Accordance with the TAG CMI Plan (Revised)

Well ID	Installation Year	Sampling Frequency	WQ	WL	Comments
Eubank-1	1988			✓	Regional Aquifer
PGS-2	1995			✓	Regional Aquifer
TA1-W-01	1997			✓	Regional Aquifer
TA1-W-02	1998	A	✓	✓	Regional Aquifer
TA1-W-03	1998				PGWS
TA1-W-04	1998			✓	Regional Aquifer
TA1-W-05	1998			✓	Regional Aquifer
TA1-W-06	1998	SA	✓	✓	PGWS
TA1-W-07	1998			✓	PGWS
TA1-W-08	2001	SA	✓	✓	PGWS
TA2-NW1-325	1993	SA	✓	✓	PGWS
TA2-NW1-595	1993	A	✓	✓	Regional Aquifer
TA2-W-01	1994	SA	✓	✓	PGWS
TA2-W-19	1995	SA	✓	✓	PGWS
TA2-W-24	1998	A	✓	✓	Regional Aquifer
TA2-W-25	1997	A	✓	✓	Regional Aquifer
TA2-W-26	1998	SA	✓	✓	PGWS
TA2-W-27	1998	SA	✓	✓	PGWS
TA2-W-28	2014	SA	✓	✓	PGWS
TJA-2	1994	SA	✓	✓	PGWS
TJA-3	1998	A	✓	✓	Regional Aquifer
TJA-4	1998	A	✓	✓	Regional Aquifer – Merging Zone
TJA-5	1998	SA	✓	✓	PGWS
TJA-6	2001	A	✓	✓	Regional Aquifer
TJA-7	2001	SA	✓	✓	PGWS
WYO-3	2001	A	✓	✓	Regional Aquifer
WYO-4	2001				PGWS
Total	----	19	19	25	----

Notes:

1. Check mark (✓) indicates that WQ sampling and WL quarterly measurements were conducted in CY 2024.
2. Green shading denotes monitoring wells screened in the Perched Groundwater System.
3. Purple shading denotes that the monitoring well is screened in the Merging Zone (below the Perching Horizon and above the Regional Aquifer).
4. No shading denotes monitoring wells screened in the Regional Aquifer.
5. Water levels are measured quarterly by SNL/NM personnel.
6. Sampling frequency used by SNL/NM personnel: SA = semiannual, A = annual.
7. Monitoring well Eubank-1 is owned by the City of Albuquerque. SNL/NM personnel measure the water level.
8. Monitoring well TA2-W-28 replaced well TA2-SW1-320 because video logging showed that its blank casing was cracked above the screen.
9. Monitoring well TA1-W-03 went dry in December 2018.
10. Responsibility for monitoring well WYO-4 was transferred to the Kirtland Air Force Base Environmental Restoration Program in 2017 (NMED, December 2018).

CMI = Corrective Measures Implementation
CY = calendar year
ID = identifier
PGS = Parade Ground South
SNL/NM = Sandia National Laboratories, New Mexico
TA1-W = Technical Area I well
TA2-NW = Technical Area II northwest well
TA2-SW = Technical Area II southwest well
TA2-W = Technical Area II well
TJA = Tijeras Arroyo well
WL = water level
WQ = water quality
WYO = Wyoming Boulevard well

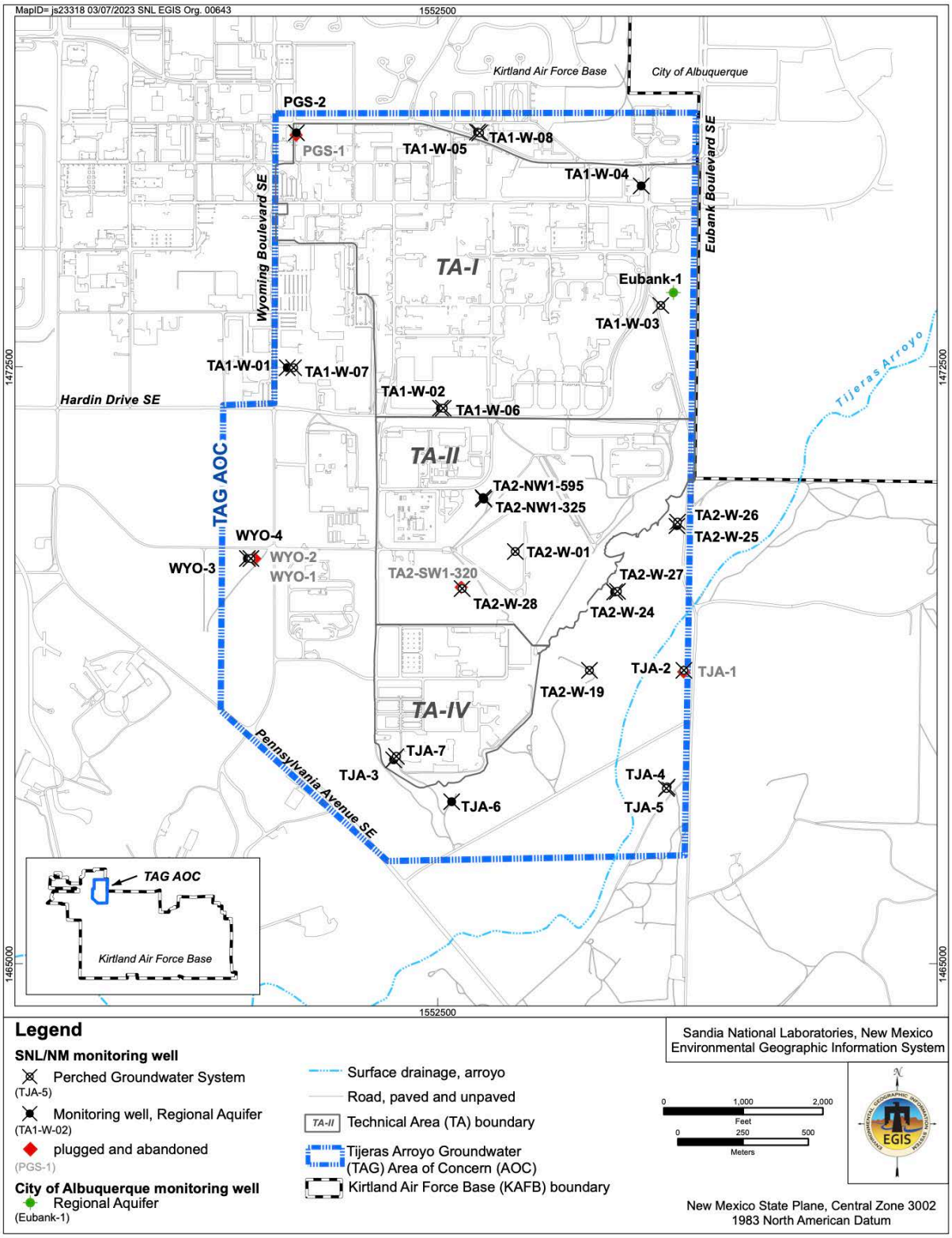


Figure 6-2
Tijeras Arroyo Groundwater Area of Concern Monitoring Wells Accessed by Sandia National Laboratories, New Mexico Personnel

6.1.5 Conceptual Site Model

The following sections summarize the CSM for the TAG AOC. A detailed CSM is provided in the Revised TAG CCM/CME Report.

The schematic depiction of the CSM (Figure 6-3) shows the complex hydrogeologic setting and variety of potential contaminant release sites. The figure was updated in 2020 to better depict the Merging Zone near the KAFB Tijeras Arroyo Golf Course and the isolated lenses of saturation in which water elevation contours are not continuous with either the PGWS or the Regional Aquifer (SNL/NM, June 2021). Also, the ABCWUA sewer interceptor line beneath the active Tijeras Arroyo channel has been removed from the figure because a COA video survey showed that the line is intact (not leaking) along the southern and eastern boundaries of the TAG AOC.

Significant features of the CSM include the following:

- The TAG AOC covers approximately 1.82 mi^2.
- The PGWS above the Perching Horizon has a lateral extent of approximately 4.43 mi^2 that in some places extends beyond the TAG AOC boundary.
- A Merging Zone between the PGWS and the Regional Aquifer occurs along Powerline Road.
- The Tijeras Arroyo channel crosses KAFB and trends along the southern edge of the TAG AOC. The watershed upstream of the Pennsylvania Blvd bridge covers approximately 88.4 mi^2.

The sediments of the Santa Fe Group underlying the TAG AOC contain two water-bearing zones: the PGWS and the Regional Aquifer. The PGWS is contained solely within the alluvial-fan lithofacies, which consists of silty sands, clayey layers, and poorly sorted gravels that are not laterally continuous. The Regional Aquifer occurs in the alluvial-fan lithofacies and the ancestral Rio Grande (ARG) fluvial lithofacies. The eastern limit of the ARG sediments near the water table trends north to south along the western boundary of the TAG AOC. The ARG sediments consist of more permeable sands and gravels that have a north-south depositional fabric. Table 6-2 summarizes the hydrogeologic characteristics of the two water-bearing zones. Beneath the TAG AOC, the depths to water for the PGWS and the Regional Aquifer average approximately 300 and 510 ft bgs, respectively. The two water-bearing zones are separated by a Perching Horizon and an approximately 200-ft-thick sequence of predominantly unsaturated sediments. Across the TAG AOC, the estimated thickness of the Perching Horizon beneath the PGWS ranges from 4 to 11 ft based on correlation of downhole geophysical logs and lithologic descriptions (SNL/NM, February 2018). The average thickness is approximately 7 ft. The Perching Horizon is composed of a layer of low-permeability, silty and clayey sediments (SNL/NM, February 2018) that dip to the southeast at approximately 1° (Van Hart, June 2003).

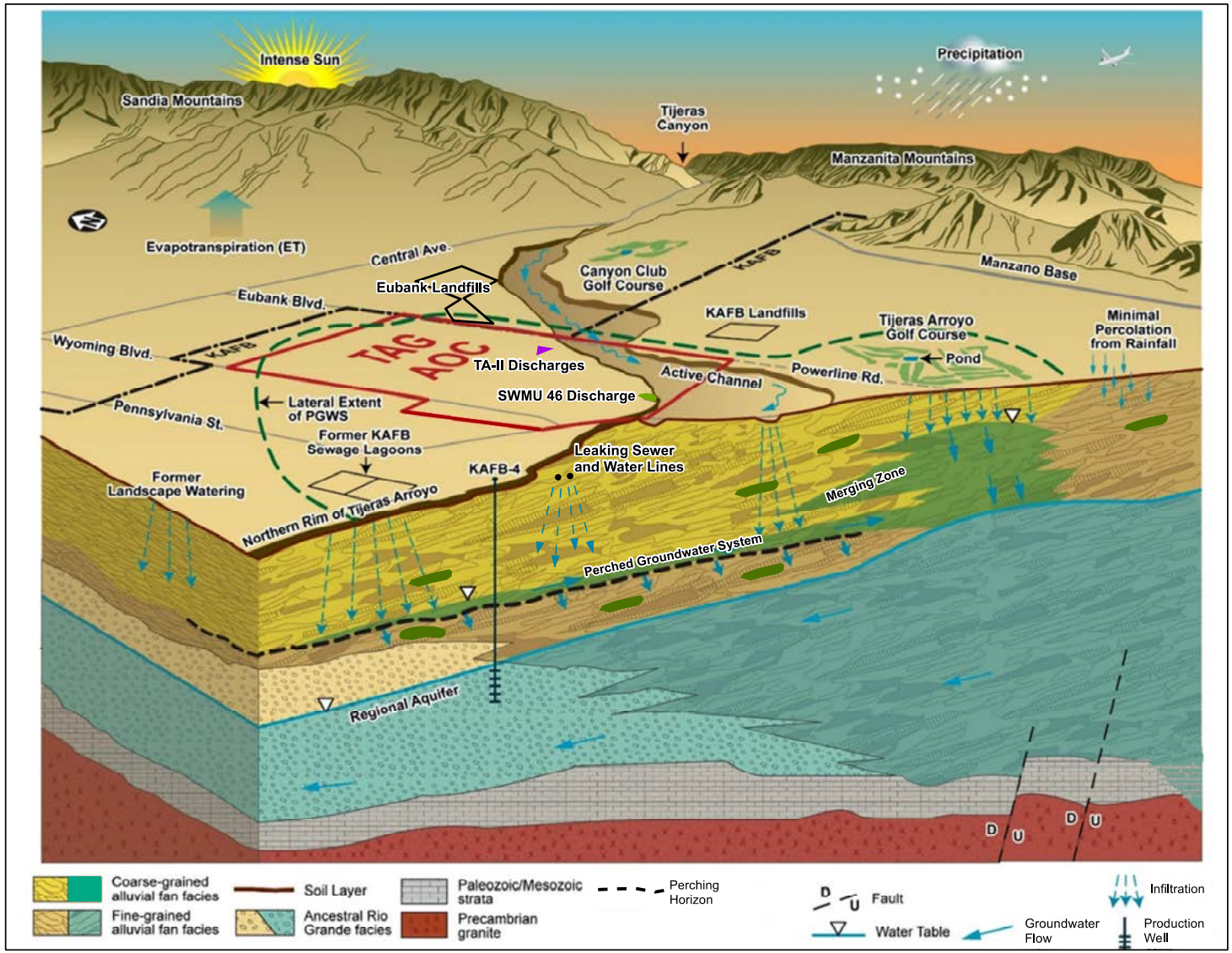


Figure 6-3
Conceptual Site Model for the Tijeras Arroyo Groundwater Area of Concern (SNL/NM, June 2021)

Table 6-2
Comparison of Hydrogeologic Characteristics of the Perched Groundwater System and Regional Aquifer in the Vicinity of the Tijeras Arroyo Groundwater Area of Concern

Characteristic	Perched Groundwater System	Regional Aquifer
Potentiometric Surface	Slopes primarily to the southeast.	Slopes primarily to the west and northwest.
Pressure Head	Unconfined (water table) conditions.	Unconfined to semiconfined conditions.
Extent of Saturation	Restricted to the alluvial-fan lithofacies.	Contained within both the alluvial-fan lithofacies and the ARG fluvial lithofacies.
Flow Direction	Primarily to the east and southeast.	Primarily to the west and northwest.
Horizontal Gradient	Varies from approximately 0.004 to 0.0125 across the TAG AOC with an average of 0.01.	Varies from approximately 0.006 to 0.0125 across the TAG AOC with an average of 0.02.
Horizontal Hydraulic Conductivity (Kh)	A wide range from 0.0532 to 3.06 ft/day, with an average of 1.63 ft/day.	A narrow range of 1.66 to 7.75 ft/day, with an average of 3.77 ft/day.
Vertical Hydraulic Conductivity (Kv)	Estimated at 0.0163 ft/day.	Estimated at 0.0377 ft/day.
Effective Porosity	Assumed to be 0.25 (25%).	Assumed to be 0.25 (25%).
Groundwater Velocity, Horizontal	Range of 0.002 to 0.122 ft/day (equivalent to 0.778 to 44.68 ft/yr). Averages approximately 24 ft/yr.	0.066 to 0.310 ft/day (equivalent to 24.24 to 113.15 ft/yr). Averages approximately 55 ft/yr.
Potable Usage	None.	Utilized by KAFB, ABCWUA, and VA production wells located west and north of the TAG AOC.
Non-potable Usage	PGWS water extraction and recirculation at the KAFB Tijeras Arroyo Golf Course.	None.
Lateral Extent	Approximately 4.43 mi^2 above the Perching Horizon. Estimated using data collected through December 2015.	Across the Albuquerque Basin.
Geochemical Uniqueness	High chloride, nitrate, and sulfate concentrations that are variable between monitoring wells. Indicative of differing types of waste streams discharged at multiple Solid Waste Management Units.	Low calcium concentrations and high bicarbonate/alkalinity concentrations that are consistent between monitoring wells. Indicative of a single source such as mountain front recharge.
Water Levels, October 2019 – October 2024	Steadily declining groundwater elevations averaging 0.24 ft/yr per well.	Overall increasing groundwater elevations averaging 0.14 ft/yr per well.
Recharge Sources	Primarily by Former KAFB Sewage Lagoons (1962-1987) and SNL/NM TA-II former wastewater outfalls and septic systems (1948-1992). Since 1966, irrigation at the KAFB Tijeras Arroyo Golf Course. Occasional surface water flow in Tijeras Arroyo following precipitation.	Primarily by mountain front recharge. Occasional surface-water flows in Tijeras Arroyo due to precipitation. Input from PGWS at the localized Merging Zone near Powerline Road.
Principal Hydrologic Controls	Stratigraphic dip of the Perching Horizon to the southeast coupled with lesser effect of the depositional fabric trending westward from the mountain front.	Combined drawdown of KAFB, ABCWUA, and VA production wells.

See notes at end of table.

Table 6-2 (concluded)
Comparison of Hydrogeologic Characteristics of the Perched Groundwater System and Regional Aquifer in the Vicinity of the Tijeras Arroyo Groundwater Area of Concern

Notes:
1. Table is based on the Revised TAG CCM/CME Report (SNL/NM, February 2018).
2. Water levels row was updated using October 2019 through October 2024 data.
3. All characteristics, except for effective porosity (SNL/NM, September 2015), were obtained from studies conducted at the TAG AOC.

ABCWUA = Albuquerque Bernalillo County Water Utility Authority
AOC = Area of Concern
ARG = ancestral Rio Grande (lithofacies)
CCM = Current Conceptual Model
CME = Corrective Measures Evaluation
ft = foot (feet)
ft/day = feet per day
ft/yr = feet per year
KAFB = Kirtland Air Force Base
mi^2 = square miles
PGWS = Perched Groundwater System
SNL/NM = Sandia National Laboratories, New Mexico
TA = Technical Area
TAG = Tijeras Arroyo Groundwater
VA = Veterans Affairs (previously known as Veterans Administration)

The *Annual Groundwater Monitoring Report, Calendar Year 2022* (SNL/NM, June 2023c) contains details regarding the variety of recharge sources located in the vicinity of the TAG AOC, a summary of groundwater modeling reports, and geochemical Piper diagrams. The Revised TAG CCM/CME Report discusses the volumes of water discharged and operational years of SNL/NM and KAFB SWMUs. There is no current or anticipated use of PGWS groundwater for potable or non-potable purposes inside the TAG AOC boundary.

Before land development in the 1940s, the alluvial-fan sediments likely did not contain sufficient natural water to fill a monitoring well casing. Subsequent water inputs from anthropogenic sources created a triggering effect that resulted in the artificial creation of the PGWS (Brady and Domski, 2001). The PGWS is currently a thin, dissipating, water-bearing zone that mostly formed as a result of historical anthropogenic discharges of wastewater and septic water. Groundwater in the PGWS migrates toward the southeast and in the Merging Zone coalesces with the underlying Regional Aquifer southeast of Tijeras Arroyo near Powerline Road. Based on MODFLOW mass-balance modeling, approximately 25% of the total groundwater loss from the PGWS is to the Merging Zone (BGW, September 2002). The remaining 75% flows vertically downward through the Perching Horizon and dissipates in the upper portion of the approximately 200 ft of unsaturated sediments present between the PGWS and the Regional Aquifer. There is no geochemical indication that groundwater flowing downward through the Perching Horizon has reached the Regional Aquifer, except in the Merging Zone southeast of the TAG AOC.

The PGWS continues to naturally dewater, primarily because of the reduction of anthropogenic water discharges resulting from:

- The Former KAFB Sewage Lagoons being taken out of service in 1987.
- SWMU 46 (Old Acid Waste Line Outfall) ending in 1974.
- The TA-II Discharges site ending in 1992.
- Less landscape watering in areas such as the former Ridgecrest Drive Base Housing, where approximately 625 homes were occupied from 1952 to 2005.

Monitoring well yields vary across the TAG AOC. This is due to the heterogeneity of the alluvial-fan sediments in which each monitoring well is screened. For example, monitoring well TA2-W-01, which typically has an approximately 2-ft water column and is completed in medium- to coarse-grained sand and gravelly sand, produces a sufficient volume of water with low drawdown to allow sampling, whereas monitoring well TA2-W-26, which typically has an approximately 7-ft water column set adjacent to silty sand, purges dry and must be allowed to recover overnight before groundwater samples can be collected.

6.1.5.1 Regional Hydrogeologic Conditions

Tijeras Arroyo is the most significant surface water drainage feature on KAFB. The arroyo trends westward across the northern part of KAFB and eventually drains into the Rio Grande approximately 8.3 mi west of the TAG AOC. Water flows in the arroyo several times per year as a result of thunderstorms. The 30-year average annual precipitation for the area, as measured at the Albuquerque International Sunport, is 8.84 in. (Chapter 2.0, Section 2.6.2.1). During most rainfall events, rainfall quickly infiltrates into the soil. However, virtually all of the moisture subsequently undergoes evapotranspiration. Estimates of potential evapotranspiration for the KAFB area range from 95 to 99% of the annual rainfall (SNL/NM, February 1998).

Based on a nearby infiltration study conducted by the COA, the recharge rate beneath Tijeras Arroyo can be estimated. The recharge rate through the vadose zone underneath Bear Canyon Arroyo was studied for the COA (DBS & Associates, Inc., April 2010). At the Bear Canyon Arroyo recharge project located 5 mi north of the KAFB Wyoming Gate, surface water reached the Regional Aquifer (at approximately 500 ft bgs) in approximately 50 days (Ewing, November 2019). Considering that the sediments beneath Bear Canyon Arroyo and Tijeras Arroyo are typically near saturation, a portion of significant surface water flow in Tijeras Arroyo could migrate downward and impact the PGWS in approximately 30 days. In stretches of Tijeras Arroyo on KAFB where the PGWS is not present, surface water could possibly reach the Regional Aquifer in approximately 40 to 50 days.

The TAG AOC overlies the eastern margin of the Albuquerque Basin where the major basin-bounding faults mostly trend parallel to the Sandia-Manzanita-Manzano mountain front. Alluvial-fan sediments obscure the Sandia Fault and West Sandia Fault east of the TAG AOC. For interpreting stratigraphic and structural features across KAFB, including the TAG AOC, Van Hart (June 2003) used outcrop maps, lithologic borehole logs, downhole geophysical logs, and surface geophysical surveys (seismic, magnetometer, and gravity). As Plate 1 shows, the Sandia Fault is located approximately 2 mi east of TA-II and the West Sandia Fault is located approximately 1.4 mi east of TA-II. Vertical offset of buried limestone strata is interpreted as being approximately 2,400 ft across the West Sandia Fault, but the fault does not extend upward to within 600 ft of the ground surface. Therefore, the West Sandia Fault is interpreted as not offsetting unconsolidated sediments at the Regional Aquifer water table. The basin-bounding faults depicted on Connell (2006) cross sections indicate that the Sandia Fault possibly dips 65° westward beneath KAFB.

6.1.5.2 Hydrogeologic Conditions at the TAG AOC

The stratigraphic unit of greatest interest in the TAG AOC is the Upper Santa Fe Group, which is primarily composed of two unconsolidated interfingering lithofacies: the alluvial-fan lithofacies and the ARG fluvial lithofacies. Both lithofacies are less than 5 Ma in age and are composed of unconsolidated to poorly cemented gravel, sand, silt, and clay (Stone et al., February 2000). The alluvial-fan lithofacies consists of poorly sorted piedmont-slope deposits derived from the Sandia, Manzanita, and Manzano Mountains. Fine-grained units within the alluvial-fan lithofacies produce low-permeability layers that are capable of perching groundwater. The ARG fluvial lithofacies are derived from northern sources and are typically composed of well-sorted, medium- to coarse-grained sands with higher hydraulic conductivities. Detailed subsurface mapping by Van Hart (June 2003) indicates that the thickness of Upper Santa Fe Group sediments beneath the central part of the TAG AOC is approximately 3,000 ft. These sediments are underlain by Mesozoic/Paleozoic limestone strata.

In 2024 across the TAG AOC, the PGWS water table averaged 298 ft bgs. The depth to water in the PGWS ranged from approximately 269 ft bgs at monitoring well TJA-5 located on the floodplain to 330 ft bgs at monitoring well TA2-W-01 located near the center of the TAG AOC. Depth to water for the Regional Aquifer exclusive of the Merging Zone ranged from approximately 436 ft bgs at monitoring well TA2-W-24 located on the floodplain to 561 ft bgs at monitoring well TA1-W-04 located on the northern boundary of the TAG AOC. The average depth to the Regional Aquifer averaged 509 ft bgs.

A review of lithologic borehole descriptions and geophysical logs indicates that the sediments between the base of the Perching Horizon and the top of the Regional Aquifer are mostly dry to moist sediments that will not yield groundwater to a monitoring well. Outside of the Merging Zone, the thickness of unsaturated sediments between the base of the Perching Horizon and the Regional Aquifer water table averaged approximately 198 ft, decreasing from approximately 247 ft on the northwest side of the TAG AOC to 151 ft along the northern rim of Tijeras Arroyo. Groundwater in the PGWS mixes with the Regional Aquifer southeast of Tijeras Arroyo in a localized Merging Zone where the anastomosing set of alluvial-fan sediments are slightly more permeable and/or a minor fault might be present (Van Hart, June 2003).

6.1.5.3 Local Directions of Groundwater Flow

Figure 6-4 presents the CY 2024 potentiometric surface map of the PGWS. In addition to data measured by SNL/NM personnel, groundwater elevation data for KAFB monitoring wells located outside the TAG AOC were used to interpret the potentiometric surface. Table 6-3 lists the groundwater elevations.

The direction of groundwater flow in the PGWS is inferred from the potentiometric surface to be predominantly to the east and southeast. The horizontal gradient of the PGWS is variable across the TAG AOC. Beneath TA-I, TA-II, and TA-IV, the horizontal gradient varies from 0.004 to 0.0125, with an average of approximately 0.01. The vertical gradient is downward, as indicated by the merging of the two water-bearing zones near the southeast corner of the TAG AOC.

Figure 6-5 presents the CY 2024 potentiometric surface map of the Regional Aquifer. In addition to data measured by SNL/NM personnel, groundwater elevation data for KAFB and COA monitoring wells located outside the TAG AOC were used to interpret the potentiometric surface. Table 6-3 lists the groundwater elevations. The direction of groundwater flow in the Regional Aquifer is inferred from the potentiometric surface to be principally to the west and northwest toward the KAFB, ABCWUA, and Veterans Affairs (VA) production wells. The horizontal gradient of the Regional Aquifer beneath the TAG AOC varies from approximately 0.006 to 0.0125, with an average of approximately 0.02. The gradient west of the TAG AOC is essentially flat in the ARG sediments. Conversely, the horizontal gradient is steeper to the east of the TAG AOC at 0.03 to 0.045. Vertical flow gradients in the Regional Aquifer are inferred to be mostly downward in response to pumping by the distant production wells.

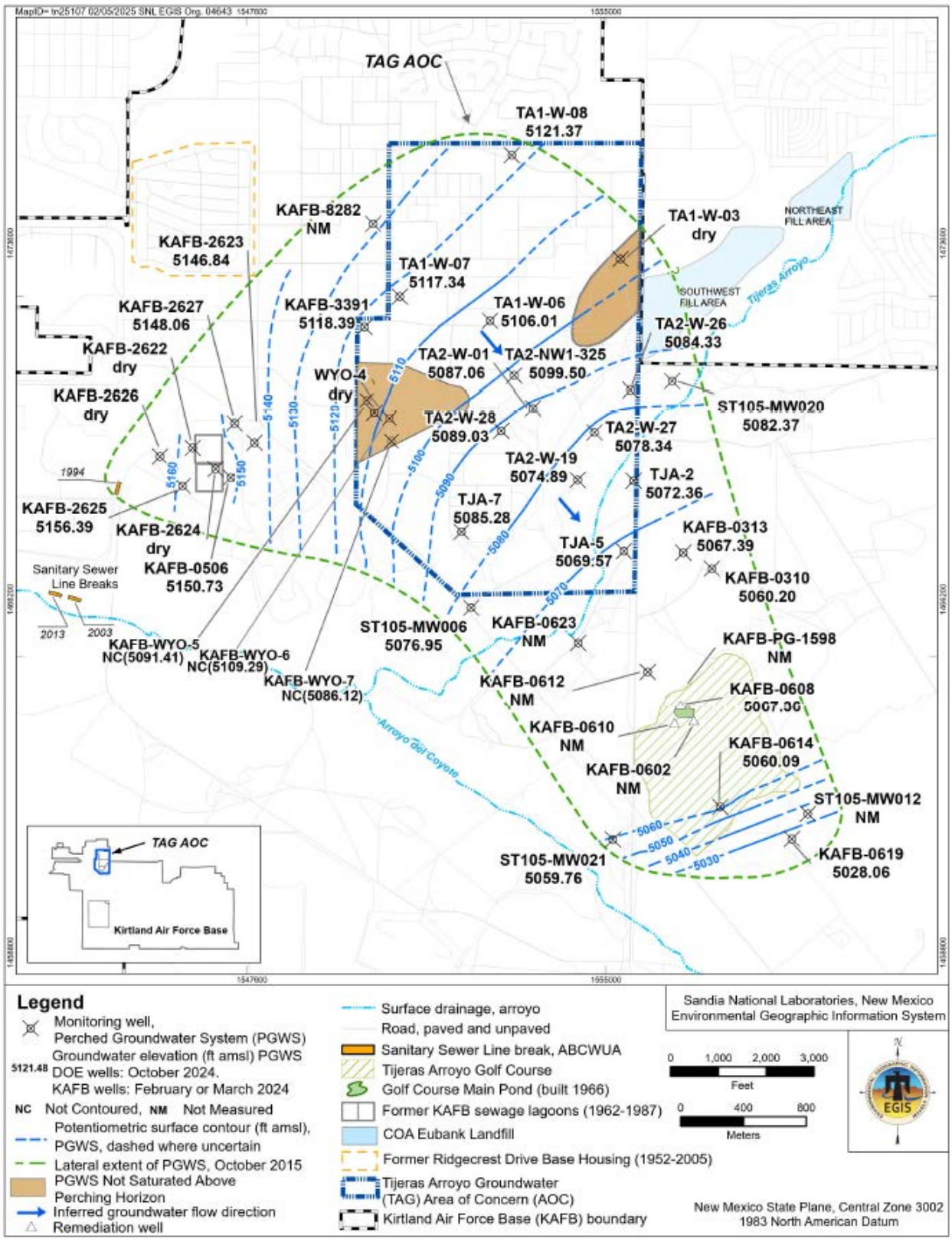


Figure 6-4
Potentiometric Surface Map of the Perched Groundwater System in the Tijeras Arroyo Groundwater Area of Concern, October 2024

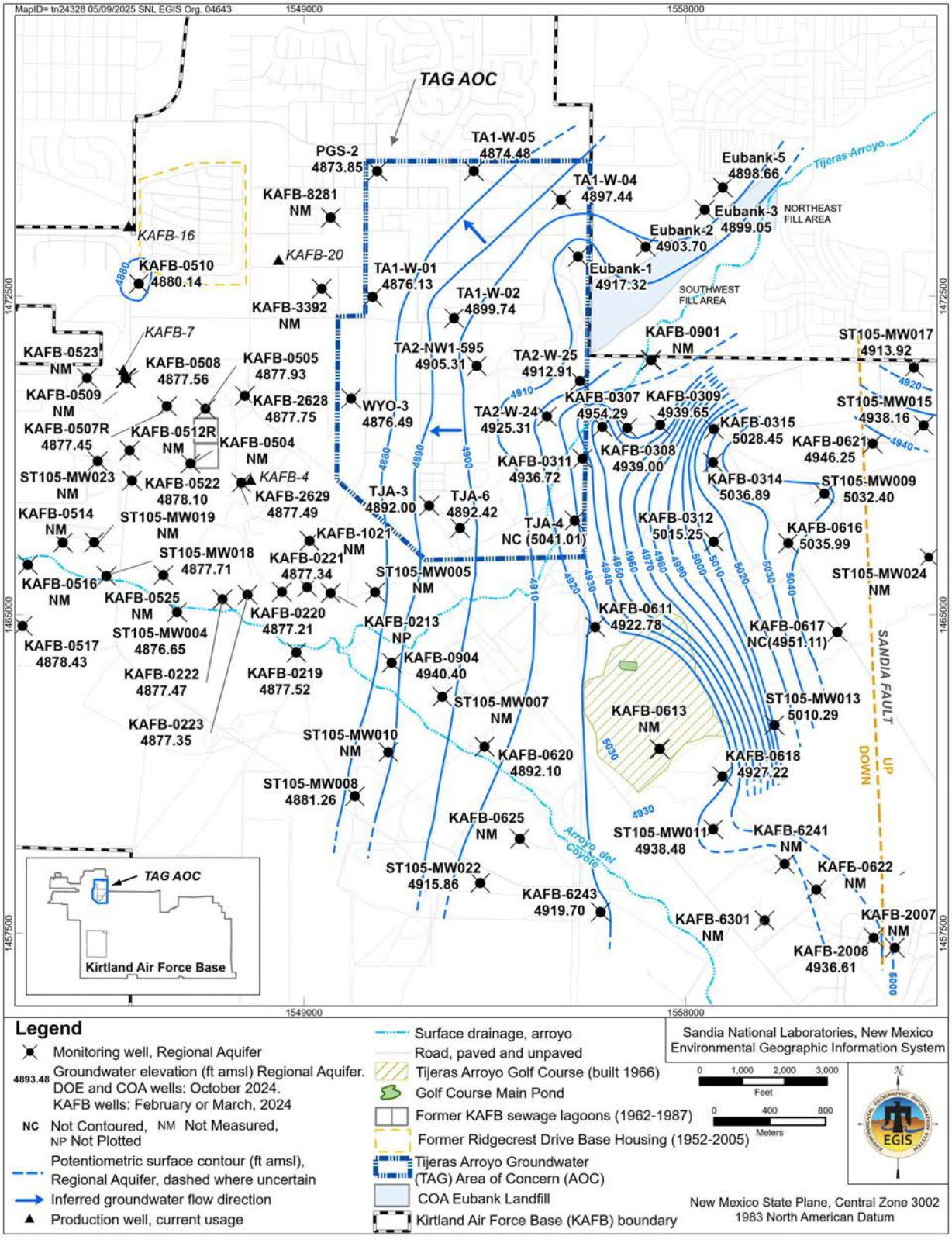


Figure 6-5
Potentiometric Surface Map of the Regional Aquifer in the Tijeras Arroyo Groundwater Area of Concern, October 2024

Table 6-3
Groundwater Elevation Data for Monitoring and Remediation Wells Located in the Vicinity of the Tijeras Arroyo Groundwater Area of Concern, October 2024

Monitoring Well ID	Measuring Point (ft amsl) NAVD 88	Date Measured	Depth to Water (ft btoc)	Groundwater Elevation (ft amsl)	Screened Unit in SFG sediments
Eubank-1	5460.02	2-Oct-2024	542.70	4917.32	Regional Aquifer
Eubank-2	5474.39	16-Dec-2024	570.69	4903.70	Regional Aquifer
Eubank-3	5498.73	16-Dec-2024	599.68	4899.05	Regional Aquifer
Eubank-5	5507.40	16-Dec-2024	608.74	4898.66	Regional Aquifer
PGS-2	5406.93	2-Oct-2024	533.08	4873.85	Regional Aquifer
TA1-W-01	5403.82	2-Oct-2024	527.69	4876.13	Regional Aquifer
TA1-W-02	5416.62	2-Oct-2024	516.88	4899.74	Regional Aquifer
TA1-W-03	5457.03	n.a.	dry	dry	PGWS
TA1-W-04	5460.98	2-Oct-2024	563.54	4897.44	Regional Aquifer
TA1-W-05	5433.84	4-Oct-2024	559.36	4874.48	Regional Aquifer
TA1-W-06	5417.10	2-Oct-2024	311.09	5106.01	PGWS
TA1-W-07	5404.92	2-Oct-2024	287.58	5117.34	PGWS
TA1-W-08	5434.19	4-Oct-2024	312.82	5121.37	PGWS
TA2-NW1-325	5421.94	2-Oct-2024	322.44	5099.50	PGWS
TA2-NW1-595	5421.26	2-Oct-2024	515.95	4905.31	Regional Aquifer
TA2-W-01	5419.99	2-Oct-2024	332.93	5087.06	PGWS
TA2-W-19	5351.21	2-Oct-2024	276.32	5074.89	PGWS
TA2-W-24	5363.66	2-Oct-2024	438.35	4925.31	Regional Aquifer
TA2-W-25	5374.86	2-Oct-2024	461.95	4912.91	Regional Aquifer
TA2-W-26	5375.77	2-Oct-2024	291.44	5084.33	PGWS
TA2-W-27	5362.85	2-Oct-2024	284.51	5078.34	PGWS
TA2-W-28	5412.41	2-Oct-2024	323.38	5089.03	PGWS
TJA-2	5353.20	2-Oct-2024	280.84	5072.36	PGWS
TJA-3	5390.56	2-Oct-2024	498.56	4892.00	Regional Aquifer
TJA-4	5341.16	2-Oct-2024	300.15	5041.01 n.c.	Merging Zone
TJA-5	5341.33	2-Oct-2024	271.76	5069.57	PGWS
TJA-6	5343.16	2-Oct-2024	450.74	4892.42	Regional Aquifer
TJA-7	5391.27	2-Oct-2024	305.99	5085.28	PGWS
WYO-3	5392.09	2-Oct-2024	515.60	4876.49	Regional Aquifer
WYO-4	5392.57	n.a.	dry	dry	PGWS
KAFB-WYO-5	5393.36	30-Sep-2024	301.95	5091.41	PGWS
KAFB-WYO-6	5393.79	30-Sep-2024	284.50	5109.29	PGWS
KAFB-WYO-7	5391.73	30-Sep-2024	305.61	5086.12	PGWS
KAFB-0213	5282.18	5-Feb-2024	407.88	n.p.	Regional Aquifer
KAFB-0219	5263.85	5-Feb-2024	386.33	4877.52	Regional Aquifer
KAFB-0220	5264.72	5-Feb-2024	387.51	4877.21	Regional Aquifer
KAFB-0221	5274.22	5-Feb-2024	396.88	4877.34	Regional Aquifer
KAFB-0222	5244.49	5-Feb-2024	367.02	4877.47	Regional Aquifer
KAFB-0223	5251.38	5-Feb-2024	374.03	4877.35	Regional Aquifer
KAFB-0307	5363.85	6-Feb-2024	409.56	4954.29	Regional Aquifer
KAFB-0308	5381.08	5-Feb-2024	442.08	4939.00	Regional Aquifer
KAFB-0309	5411.29	6-Feb-2024	471.64	4939.65	Regional Aquifer
KAFB-0310	5416.06	6-Feb-2024	355.86	5060.20	PGWS
KAFB-0311	5352.74	6-Feb-2024	416.02	4936.72	Regional Aquifer
KAFB-0312	5431.93	6-Feb-2024	416.68	5015.25	Regional Aquifer
KAFB-0313	5418.58	6-Feb-2024	351.19	5067.39	PGWS
KAFB-0314	5455.45	6-Feb-2024	418.56	5036.89	Regional Aquifer
KAFB-0315	5466.53	6-Feb-2024	438.08	5028.45	Regional Aquifer
KAFB-0505	5363.65	29-Mar-2024	485.72	4877.93	Regional Aquifer
KAFB-0506	5363.62	30-Sep-2024	212.89	5150.73	PGWS

See notes at end of table.

Table 6-3 (continued)
Groundwater Elevation Data for Monitoring and Remediation Wells Located in the Vicinity of the Tijeras Arroyo Groundwater Area of Concern, October 2024

Monitoring Well ID	Measuring Point (ft amsl) NAVD 88	Date Measured	Depth to Water (ft btoc)	Groundwater Elevation (ft amsl)	Screened Unit in SFG sediments
KAFB-0507R	5358.56	8-May-2024	481.11	4877.45	Regional Aquifer
KAFB-0508	5353.62	20-Feb-2024	476.06	4877.56	Regional Aquifer
KAFB-0510	5372.30	26-Feb-2024	492.16	4880.14	Regional Aquifer
KAFB-0517	5197.11	5-Mar-2024	318.68	4878.43	Regional Aquifer
KAFB-0522	5270.06	29-Mar-2024	391.96	4878.10	Regional Aquifer
KAFB-0602	5364.07	29-Mar-2024	n.m.	n.m.	PGWS
KAFB-0608	5359.80	29-Mar-2024	292.44	5067.36	PGWS
KAFB-0610	5359.22	29-Mar-2024	n.m.	n.m.	PGWS
KAFB-0611	5386.08	19-Feb-2024	463.30	4922.78	Regional Aquifer
KAFB-0614	5391.22	22-Feb-2024	331.13	5060.09	PGWS
KAFB-0616	5481.04	19-Feb-2024	445.05	5035.99	Regional Aquifer
KAFB-0617	5506.07	19-Feb-2024	554.96	4951.11	Regional Aquifer
KAFB-0618	5411.63	19-Feb-2024	484.41	4927.22	Regional Aquifer
KAFB-0619	5412.37	19-Feb-2024	384.31	5028.06	PGWS
KAFB-0620	5334.34	19-Feb-2024	442.24	4892.10	Regional Aquifer
KAFB-0621	5568.89	20-Feb-2024	622.64	4946.25	Regional Aquifer
KAFB-0904	5291.75	27-Feb-2024	351.35	4940.40	Regional Aquifer
KAFB-2008	5541.62	20-Feb-2024	602.01	4939.61	Regional Aquifer
KAFB-2622	5360.17	29-Mar-2024	dry	dry	PGWS
KAFB-2623	5369.28	30-Sep-2024	222.44	5146.84	PGWS
KAFB-2624	5364.21	29-Mar-2024	dry	dry	PGWS
KAFB-2625	5356.62	29-Mar-2024	200.23	5156.39	PGWS
KAFB-2626	5357.55	29-Mar-2024	dry	dry	PGWS
KAFB-2627	5367.51	30-Sep-2024	219.45	5148.06	PGWS
KAFB-2628	5369.44	29-Mar-2024	491.69	4877.75	Regional Aquifer
KAFB-2629	5361.66	29-Mar-2024	484.17	4877.49	Regional Aquifer
KAFB-3391	5396.19	30-Sep-2024	277.80	5118.39	PGWS
KAFB-6243	5423.48	19-Feb-2024	503.78	4919.70	Regional Aquifer
ST105-MW004	5234.86	4-Mar-2024	358.21	4876.65	Regional Aquifer
ST105-MW006	5313.19	19-Feb-2024	236.24	5076.95	PGWS
ST105-MW008	5359.14	20-Feb-2024	477.88	4881.26	Regional Aquifer
ST105-MW009	5519.08	19-Feb-2024	486.68	5032.40	Regional Aquifer
ST105-MW011	5422.23	19-Feb-2024	483.75	4938.48	Regional Aquifer
ST105-MW013	5446.71	19-Feb-2024	436.42	5010.29	Regional Aquifer
ST105-MW015	5623.29	6-Mar-2024	685.13	4938.16	Regional Aquifer
ST105-MW017	5617.90	19-Feb-2024	703.98	4913.92	Regional Aquifer
ST105-MW018	5222.12	20-Feb-2024	344.41	4877.71	Regional Aquifer
ST105-MW020	5383.35	19-Feb-2024	300.98	5082.37	PGWS
ST105-MW021	5390.75	23-Feb-2024	330.99	5059.76	PGWS
ST105-MW022	5386.64	5-Mar-2024	470.78	4915.86	Regional Aquifer

See notes at end of table.

Table 6-3 (concluded)
Groundwater Elevation Data for Monitoring and Remediation Wells Located in the Vicinity of the Tijeras Arroyo Groundwater Area of Concern, Calendar Year 2024

Notes:
1. Green shading denotes monitoring wells screened in the Perched Groundwater System.
2. Purple shading denotes that the monitoring well is screened in the localized Merging Zone (below the Perching Horizon and above the Regional Aquifer).
3. No shading denotes monitoring wells screened in the Regional Aquifer.
4. At monitoring well TA1-W-03, water was last measured in the screen in October 2018. No water was present in the screen in January 2019. The well likely went dry (the water level declined below the lowest slot) in December 2018.
5. Monitoring well WYO-4 went dry in June 2023.
6. Only those KAFB-owned wells that are on a routine measurement schedule (Geiger, December 2024) are listed.

amsl = above mean sea level
btoc = below top of casing (the measuring point)
ft = foot (feet)
ID = identifier
KAFB = Kirtland Air Force Base
NAVD 88 = North American Vertical Datum of 1988
n.a. = not applicable
n.c. = not contoured (based on professional judgement)
n.m. = not measured (water level not accessible due to pump installation (Geiger, December 2024)
n.p. = not plotted (due to field measurement error as noted by Geiger, December 2024)
PGS = Parade Ground South
PGWS = Perched Groundwater System
SFG = Santa Fe Group
ST105-MW = KAFB project ST-105 monitoring well
TA1-W = Technical Area I well
TA2-NW = Technical Area III northwest well
TA2-W = Technical Area II well
TJA = Tijeras Arroyo well
WYO = Wyoming Boulevard well

6.1.5.4 Groundwater Elevations

The TAG AOC hydrographs (Attachment 6B, Figures 6B-1 through 6B-10) show the groundwater elevation trends for PGWS and Regional Aquifer monitoring wells. No seasonality, such as a response to the summer monsoon rainfall, is apparent for the PGWS (Figures 6B-6, 6B-7, 6B-9, and 6B-10). Historically, water levels in the PGWS have trended downward in the TAG AOC. Near the Former KAFB Sewage Lagoons, water levels have been declining since 1987, apparently in response to the lagoons being removed from service (KAFB, January 2025). Within the TAG AOC, artificial recharge to the PGWS has been nearly eliminated; SNL/NM wastewater outfalls and septic waste leach fields/seepage pits are no longer in operation (the greatest discharge ended in 1974 and all discharges ended by 1992). Currently, only minor amounts of landscape water and larger volumes of occasional surface water infiltration at Tijeras Arroyo could potentially reach the PGWS.

The northernmost Regional Aquifer monitoring wells, TA1-W-05 and PGS-2 (Figures 6B-1 and 6B-4, respectively), show a cycle related to pumping by KAFB, ABCWUA, and VA production wells because of increased demand in the summer months. Since late 2008, hydrographs for most of the Regional Aquifer monitoring wells in the TAG AOC have shown an increasing trend in groundwater elevations (Attachment 6B). Presumably, this is in response to the ABCWUA transitioning to surface water withdrawals for potable water supplies and a decreasing dependence on the production wells immediately north of KAFB (Section 2.6). Since 2010, the overall trend in groundwater elevations in the northern and central parts of the TAG AOC has increased by approximately 0.5 to 2.7 ft/yr in the Regional Aquifer. The hydrographs for monitoring wells TA1-W-04 and TA1-W-05 (Figures 6B-2 and 6B-1, respectively) have differing slopes, indicating that a partially impermeable hydraulic barrier possibly exists between the two wells. Water levels in the southwest corner of the TAG AOC at monitoring wells TJA-3 and TJA-6 (Figure 6B-5) have been stable since 2000.

For the five-year period of October 2019 to October 2024, the water levels at 11 of the 13 Regional Aquifer monitoring wells increased by 0.02 to 0.59 ft/yr. Conversely, the water levels at the two farthest north monitoring wells, PGS-2 and TA1-W-05, decreased by 0.23 and 0.76 ft/yr, respectively. Increases farther southeast of Tijeras Arroyo at some of the Regional Aquifer monitoring wells owned by KAFB probably resulted from irrigation at the KAFB Tijeras Arroyo Golf Course (BGW, February 2001).

6.1.5.5 Dewatering Prediction for the Perched Groundwater System

Table 6-4 lists the annual decline rates for groundwater elevations at PGWS monitoring wells in the TAG AOC from October 2019 through October 2024, as well as the predicted year when the water level will decline below each well screen. Excluding dry monitoring wells TA1-W-03 and WYO-4, the annual decline rates were 0.10 to 0.37 ft/yr and the average decline rate was 0.24 ft/yr. Figure 6-6 shows that the greatest annual decline in the groundwater elevations occurred in the central part of the TAG AOC. Figure 6-7 illustrates the consistently declining water levels at the monitoring wells. The water levels at all PGWS monitoring wells have consistently declined since 2005.

In October 2024, the water columns in the PGWS monitoring wells ranged from 1.66 to 18.07 ft (Table 6-4). Figure 6-8 shows that the PGWS monitoring wells located across the central part of the TAG AOC had the shortest predicted lifespans for measuring water levels. Three of the 14 PGWS monitoring wells are predicted to be dry in 2030. Four of the 14 PGWS monitoring wells will be dry in 2040. Five of the 14 PGWS monitoring wells and approximately 40% of the PGWS in the TAG AOC will be dry by 2050. Only in the northwest and southeast corners of the TAG AOC will water be present in the well screens after 2050. These predictions assume linear water level decline rates. However, this assumption may not hold true for all PGWS monitoring wells during remedy implementation. For example, the water level at monitoring well TA1-W-03 declined steadily at approximately 1.7 ft/yr from January 2014 through February 2017 and then declined more rapidly at approximately 3.5 ft/yr from February 2017 to October 2018.

As the PGWS continues to naturally dewater, the issue of installing replacement monitoring wells will be evaluated on a case-by-case basis in accordance with the TAG CMI Plan (Revised). One issue to consider is the estimated thickness of saturated sediments beneath a particular well screen. Twelve of the 14 PGWS monitoring wells have well screens where the entire length of each screen was installed above the Perching Horizon. In accordance with work plans, the 20-ft-long well screens were installed so that the upper portion of each screen intercepted the water table at the time of drilling. Where the total thickness of saturated sediments exceeded 20 ft, the deeper saturated sediments were therefore not screened. Geophysical logs for PGWS and Regional Aquifer monitoring well pairs (SNL/NM, February 2018) were used to estimate the thickness of saturated sediments below each well screen. Table 6-4 shows that the estimated thickness of saturated sediments below each well screen ranges from 1 to 16 ft in 12 of the 14 PGWS monitoring wells. The average saturated thickness below the 12 well screens is 5 ft. Two monitoring wells (TA2-W-28 and TJA-2) have well screens that extend into the Perching Horizon and likely do not have deeper sediments beneath the Perching Horizon suitable for future installations.

6.1.5.6 Lateral Extent of the Perched Groundwater System

During preparation of the Revised TAG CCM/CME Report, the lateral extent of the PGWS above the Perching Horizon was estimated at approximately 4.43 mi^2 using data collected through December 2015 (SNL/NM, December 2016). Saturation of the PGWS sediments is not laterally continuous across the north-central portion of KAFB. In 2024, two monitoring wells (TA1-W-03 and WYO-4) were dry; the estimated areas of dewatered sediments surrounding the two wells were 42 and 70 acres, respectively. The combined area (112 acres) comprises approximately 10% of the TAG AOC. Dewatering is also evident at KAFB monitoring wells. Three KAFB-owned PGWS monitoring wells at the Former KAFB Sewage Lagoons, located 0.5 mi west of the TAG AOC, have also gone dry. Monitoring well KAFB-2622 went dry in March 2020. Monitoring wells KAFB-2624 and KAFB-2626 went dry in November 2020.

Table 6-4
Annual Decline Rates for Groundwater Elevations at Perched Groundwater System Monitoring Wells in the Tijeras Arroyo Groundwater Area of Concern

Well ID	Annual Decline Rate for Groundwater Elevation from October 2019 Through October 2024, ft	Water Column in Well Screen, October 2024, ft	Predicted Year When Water Level Declines Below Well Screen	Estimated Thickness of Saturated PGWS Sediments Below Bottom of Well Screen, ft
TA1-W-03	Dry – December 2018	dry	n.a.	5
TA1-W-06	0.22	8.61	2063	6
TA1-W-07	0.18	3.14	2042	1
TA1-W-08	0.10	8.67	2111	6
TA2-NW1-325	0.33	4.50	2038	3
TA2-W-01	0.29	1.66	2030	8
TA2-W-19	0.37	11.79	2056	10
TA2-W-26	0.25	6.53	2051	7
TA2-W-27	0.36	12.54	2060	1
TA2-W-28	0.32	9.53	2055	-3
TJA-2	0.25	16.06	2088	-1
TJA-5	0.12	18.07	2174	16
TJA-7	0.15	7.38	2073	2
WYO-4	Dry – June 2023	dry	n.a.	3
Average	0.24	9.04	n.a.	5

Notes:
1. Water column is length of water above the lowermost screen slot.
2. The average decline rate does not include dry monitoring wells TA1-W-03 and WYO-4.
3. The average water column in well value does not include dry monitoring wells TA1-W-03 and WYO-4.
4. Negative thickness of saturated PGWS sediments indicates that the well screen extends into the Perching Horizon.
5. Thickness of saturated PGWS sediments below each well screen was estimated using geophysical logs (SNL/NM, February 2018).
6. At monitoring well TA1-W-03, water was last measured in the screen in October 2018. No water was present in the screen in January 2019. The well likely went dry (the water level declined below the lowest slot) in December 2018.
7. Monitoring well WYO-4 went dry in June 2023.

ft = foot (feet)
ID = identifier
n.a. = not applicable
PGWS = Perched Groundwater System
TA1-W = Technical Area I well
TA2-NW = Technical Area II northwest well
TA2-W = Technical Area II well
TJA = Tijeras Arroyo well
WYO = Wyoming Boulevard well

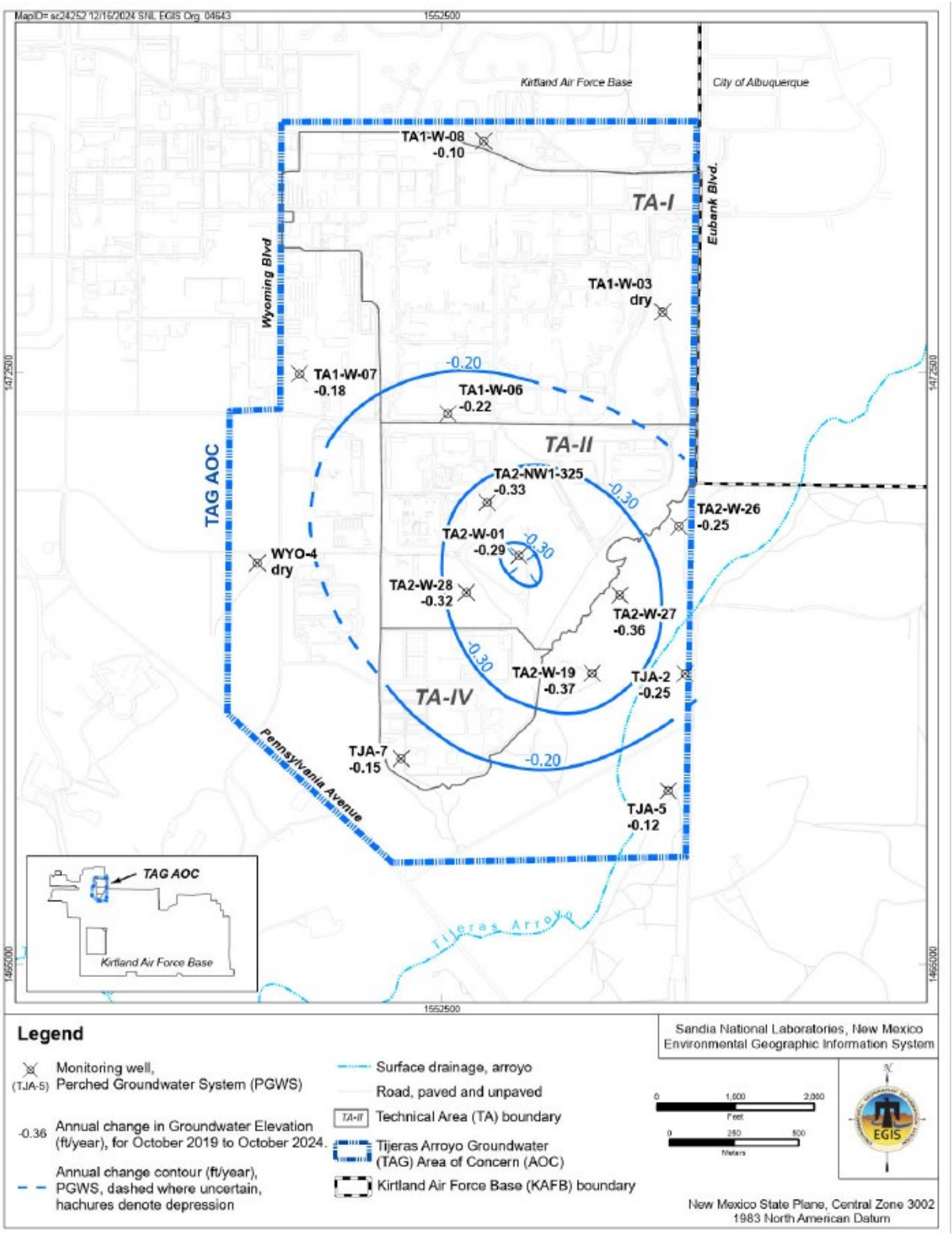


Figure 6-6
Annual Decline Rates for Groundwater Elevations at Perched Groundwater System Monitoring Wells in the Tijeras Arroyo Groundwater Area of Concern

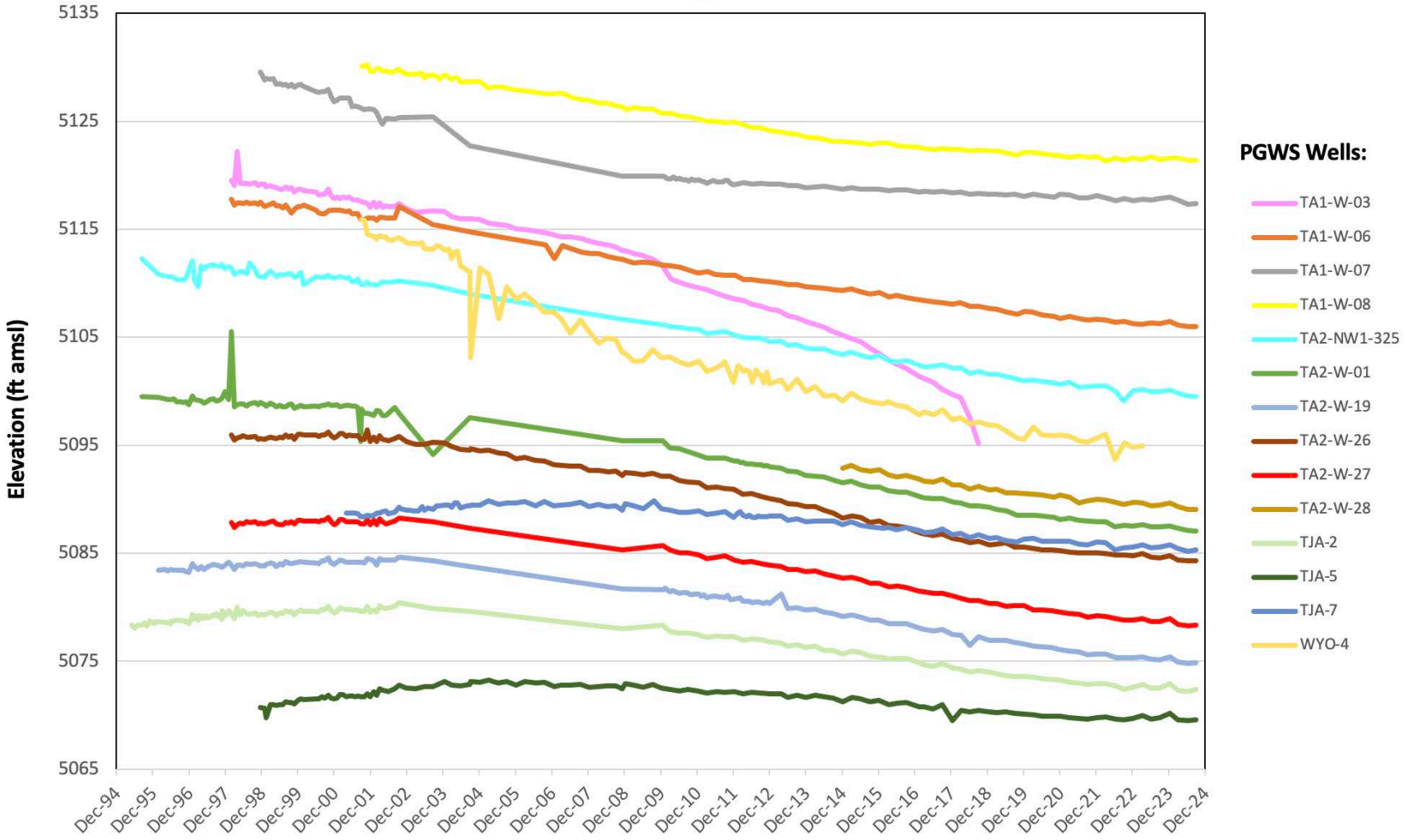


Figure 6-7
Hydrographs for Perched Groundwater System Monitoring Wells in the Tijeras Arroyo Groundwater Area of Concern

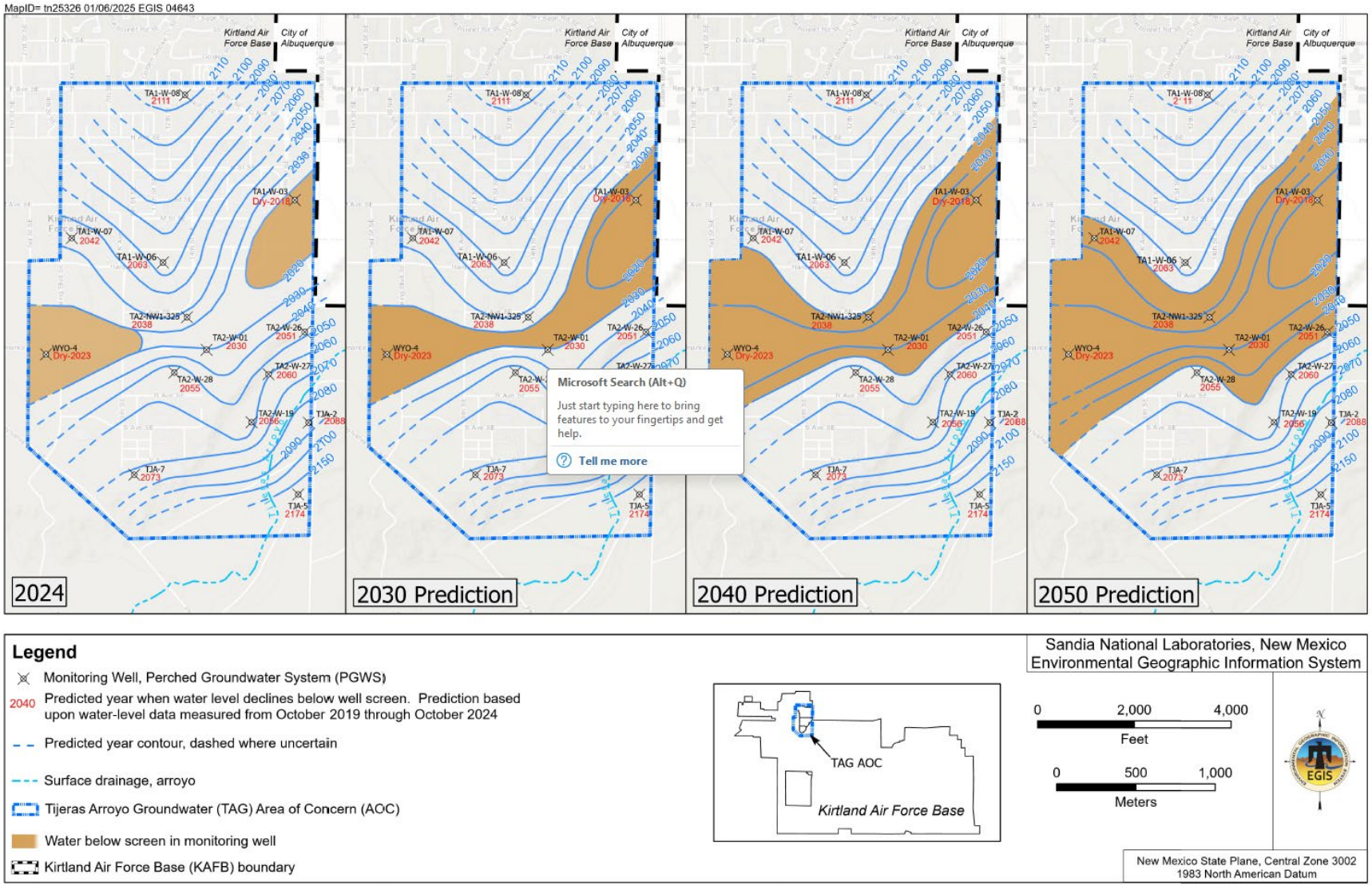


Figure 6-8
Lateral Extent of the Perched Groundwater System in the Tijeras Arroyo Groundwater Area of Concern

6.1.5.7 Contaminant Sources

Historical SNL/NM discharges of wastewater and septic water from SWMU 46 (Old Acid Waste Line Outfall) and the TA-II Discharges site are the sources most likely to have impacted the groundwater in the TAG AOC. Discharges at SWMU 46 ended in 1974. Discharges at TA-II ended in 1992 (SNL/NM, February 2018).

6.1.5.8 Contaminant Transport in Groundwater

Potential receptors are the KAFB, ABCWUA, and VA production wells (SNL/NM, February 2018). These production wells are located to the north and northwest of the TAG AOC (Plate 1). Three numerical modeling efforts have been conducted for the vicinity of the TAG AOC:

- Capture zone analysis for production wells (SNL/NM, February 2001)
- Contaminant transport modeling (SNL/NM, August 2005)
- Conceptual groundwater modeling incorporating recharge features and stratigraphic controls (BGW, September 2002)

Only the ABCWUA Ridgecrest Well Field was determined to be downgradient of TAG AOC nitrate contamination. The computer modeling predicted that nitrate in the PGWS could potentially reach the well field after a travel time of 130 years along a complex, approximately 3-mile-long flow path southeastward through the PGWS, downward into the Merging Zone, and northward through the Regional Aquifer. Before reaching the production wells, nitrate concentrations would attenuate to 0.24 mg/L, which is well below the EPA MCL of 10 mg/L. Thus, there is no foreseeable risk to human health or threat to the beneficial use of groundwater from historical SNL/NM operations where nitrate contamination has impacted PGWS groundwater.

6.2 Regulatory Requirements

TAG AOC groundwater monitoring is subject to the Consent Order and the comprehensive site-wide groundwater monitoring plan submitted to the NMED annually, which is consistent with the TAG CMI Plan (Revised).

The NMED Hazardous Waste Bureau provides regulatory oversight of SNL/NM Environmental Restoration Operations and enforces regulations mandated by the Resource Conservation and Recovery Act. All SWMUs and AOCs at SNL/NM are listed in the *Resource Conservation and Recovery Act Facility Operating Permit for Sandia National Laboratories, EPA ID No. NM5890110518* (RCRA Permit) (NMED, January 2015, as modified).

In April 2004, the Consent Order took effect and regulatory authority for corrective action requirements was transferred from the RCRA Permit to the Consent Order. The Consent Order defines all TAG AOC corrective action requirements. The MNA final remedy is currently being implemented in accordance with the TAG CMI Plan (Revised).

6.3 Scope of Activities

CY 2024 TAG AOC groundwater monitoring activities included:

- Quarterly water level measurements at 25 TAG AOC monitoring wells (Table 6-1).
- Semiannual/annual collection and analysis of groundwater samples from 19 TAG AOC monitoring wells (Table 6-1), specifically:
  - 11 PGWS monitoring wells (TA1-W-06, TA1-W-08, TA2-NW1-325, TA2-W-01, TA2-W-19, TA2-W-26, TA2-W-27, TA2-W-28, TJA-2, TJA-5, and TJA-7) in February/March and August/September 2024.
  - 8 Regional Aquifer monitoring wells (TA1-W-02, TA2-NW1-595, TA2-W-24, TA2-W-25, TJA-3, TJA-4, TJA-6, and WYO-3) in August/September 2024.
- Inspection of the TAG AOC monitoring wells during each monitoring event (water level measurement and groundwater sampling event). The inspected items included signage, identification marker, padlock, well casing cap, well-head integrity (concrete pad and stovepipe [monument] or flush mount [vault]), and possible evidence of unauthorized access. The area around each monitoring well was also inspected for erosion, subsidence, and pavement damage.
- Resurvey of the measuring point for monitoring well PGS-2, which was converted from a stovepipe (monument) to a vault (flush mount). The resurveyed measuring point (top of well casing) is 1.36 ft lower than previously reported.
- Preparation of hydrographs (Attachment 6B), analytical results tables (Attachment 6C), and concentration trend plots (Attachment 6D).
- Submittal of the *Comprehensive Site-Wide Groundwater Monitoring Plan, Calendar Year 2025* (SNL/NM, April 2024).

Table 6-5 summarizes both sampling events; Table 6-6 lists the analytes for each monitoring well for each sampling event. In accordance with the TAG CMI Plan (Revised), nitrate is the only COC for the environmental samples. Samples for other analyses were collected for waste characterization purposes in accordance with the NMED-approved *Comprehensive Site-Wide Groundwater Monitoring Plan (Revised), Calendar Year 2024* (CY 2024 Comprehensive Site-Wide Plan) (SNL/NM, April 2023b; NMED, October 2023a).

Table 6-5
Tijeras Arroyo Groundwater Area of Concern Monitoring Well Network and Sampling Dates, Calendar Year 2024

Date of Sampling Event	Monitoring Wells Sampled		Monitoring Plan
February/March 2024	TA1-W-06 TA1-W-08 TA2-NW1-325 TA2-W-01 TA2-W-19 TA2-W-26 TA2-W-27 TA2-W-28 TJA-2 TJA-5 TJA-7		CY 2024 Comprehensive Site-Wide Plan (SNL/NM, April 2023b)
August/September 2024	TA1-W-02 TA1-W-06 TA1-W-08 TA2-NW1-325 TA2-NW1-595 TA2-W-01 TA2-W-19 TA2-W-24 TA2-W-25 TA2-W-26	TA2-W-27 TA2-W-28 TJA-2 TJA-3 TJA-4 TJA-5 TJA-6 TJA-7 WYO-3	CY 2024 Comprehensive Site-Wide Plan (SNL/NM, April 2023b)

Notes:
1. Green shading denotes monitoring wells screened in the Perched Groundwater System.
2. Purple shading denotes that the monitoring well is screened in the Merging Zone (below the Perching Horizon and above the Regional Aquifer).
3. No shading denotes monitoring wells screened in the Regional Aquifer.

TA1-W = Technical Area-I well
TA2-NW = Technical Area-II northwest well
TA2-W = Technical Area-II well
TJA = Tijeras Arroyo well
WYO = Wyoming Boulevard well

Table 6-6
Analytes for Tijeras Arroyo Groundwater Area of Concern
Monitoring Wells, Calendar Year 2024

Analytes	February/March 2024	
NPN	TA1-W-06	TA2-W-19
	TA1-W-06 (duplicate)	TA2-W-26
	TA1-W-08	TA2-W-27
	TA1-W-08 (duplicate)	TA2-W-28
	TA2-NW1-325	TJA-2
	TA2-NW1-325 (duplicate)	TJA-5
	TA2-W-01	TJA-7
		TJA-7 (duplicate)
Analytes	**August/September 2024**	
Alkalinity[a]	TA1-W-02	TA2-W-27
Major Anions[a]	TA1-W-06	TA2-W-28
Gamma Spectroscopy (short list) [a, b]	TA1-W-08	TJA-2
Gross Alpha/Beta Activity[a]	TA2-NW1-325	TJA-3
NPN	TA2-NW1-595	TJA-4
TAL Metals plus Total Uranium[a]	TA2-NW1-595	TJA-4 (duplicate)
Tritium[a]	(duplicate)	TJA-5
VOCs[a]	TA2-W-01	TJA-6
	TA2-W-01 (duplicate)	TJA-7
	TA2-W-19	WYO-3
	TA2-W-24	WYO-3 (duplicate)
	TA2-W-24 (duplicate)	
	TA2-W-25	
	TA2-W-26	

Notes:
1. Green shading denotes monitoring wells screened in the Perched Groundwater System.
2. Purple shading denotes that the well is screened in the Merging Zone (below the Perching Horizon and above the Regional Aquifer).
3. No shading denotes monitoring wells screened in the Regional Aquifer.
4. Environmental duplicate samples are not analyzed for alkalinity, anions, radionuclides, metals, or VOCs.
5. Monitoring wells TA2-W-26 and WYO-3 were resampled for VOCs in November 2024 because the August/September 2024 samples had labeling discrepancies at the analytical laboratory.

[a] Analyses performed for waste characterization purposes.
[b] Gamma spectroscopy short list consists of americium-241, cesium-137, cobalt-60, and potassium-40

NPN = nitrate plus nitrite
TA1-W = Technical Area-I well
TA2-NW = Technical Area-II northwest well
TA2-W = Technical Area-II well
TAL = Target Analyte List
TJA = Tijeras Arroyo well
VOC = volatile organic compound
WYO = Wyoming Boulevard well

6.4 Field Procedures and Measurements

Chapter 1.0, Section 1.3 describes how the CY 2024 TAG AOC groundwater data were collected and analyzed.

6.5 Analytical Methods

The analytical laboratory analyzed the groundwater samples using the applicable EPA and DOE-specified methods and protocols identified in Chapter 1.0, Section 1.3.2 (Tables 1-5 and 1-6).

Nitrate concentrations were measured by a nitrate plus nitrite (NPN) as nitrogen analytical method. Historical TAG AOC groundwater analyses have demonstrated that nitrite concentrations are below the method detection limit (MDL) and do not contribute to the results of NPN analyses. Therefore, NPN results in this chapter and its attachments represent nitrate concentrations, which are also referred to as NPN concentrations.

6.6 Summary of Calendar Year 2024 Groundwater Monitoring Results

The following sections summarize the CY 2024 TAG AOC groundwater monitoring results. Attachment 6B (Figures 6B-1 through 6B-10) present the TAG AOC hydrographs. Attachment 6C (Tables 6C-1 through 6C-7) presents the analytical results and field water quality parameter measurements for both sampling events. The analytical results were reviewed and qualified during data validation and include the laboratory and validation qualifiers. Attachment 6D (Figures 6D-1 through 6D-6) presents concentration trend plots for the monitoring wells where NPN concentrations exceeded the EPA MCL.

The analytical results are compared to the EPA MCLs, where established. The analytical results and analytical laboratory data packages (Data Package 5) were submitted to the SNL/NM Customer Funded Records Center for retention.

6.6.1 Analytical Results for Environmental Samples

The environmental samples (Table 6-6) were analyzed for NPN. Table 6-7 lists the maximum NPN concentrations for the water-bearing zones in the TAG AOC. Consistent with previous years, the NPN concentrations at five PGWS monitoring wells located in the southeast corner of the TAG AOC (TA2-W-19, TA2-W-28, TJA-2, TJA-5, and TJA-7) exceeded the EPA MCL of 10 mg/L. The maximum NPN concentration in the PGWS was 21.9 mg/L in the September 2024 TJA-7 environmental sample. The NPN concentrations at the solitary Merging Zone well (TJA-4) also exceeded the EPA MCL at 32.1 and 32.5 mg/L in the environmental and environmental duplicate samples, respectively. The NPN concentrations at the Regional Aquifer monitoring wells did not exceed the EPA MCL. The maximum NPN concentrations in the Regional Aquifer were 3.79 and 3.72 mg/L in the TA2-NW1-595 environmental and environmental duplicate samples, respectively.

Table 6-7
Tijeras Arroyo Groundwater Area of Concern Monitoring Wells Where Nitrate Plus Nitrite Concentrations Exceeded the EPA MCL in Calendar Year 2024

Water-Bearing Unit	Number of Monitoring Wells Where NPN Concentrations Exceeded the EPA MCL of 10 mg/L in CY 2024	Maximum NPN Concentration in CY 2024 (mg/L)
Perched Groundwater System	Five monitoring wells (TA2-W-19, TA2-W-28, TJA-2, TJA-5, TJA-7)	21.9
Merging Zone	One monitoring well (TJA-4)	32.5
Regional Aquifer	None	3.79

Notes:
CY = calendar year
EPA = U.S. Environmental Protection Agency
MCL = maximum contaminant level
mg/L = milligrams per liter
NPN = nitrate plus nitrite
TA2-W = Technical Area II well
TJA = Tijeras Arroyo well

Table 6-8 lists the maximum NPN concentrations for the five PGWS monitoring wells for the period of CY 2020 through CY 2024. During the last year (CY 2023 to CY 2024), the NPN concentrations at TA2-W-19 and TJA-2 increased by 0.8 and 0.5 mg/L, respectively, while the NPN concentrations at TA2-W-28 and TJA-5 decreased by 2.1 and 0.3 mg/L, respectively. The NPN concentrations at TJA-7 did not change from CY 2023 to CY 2024.

Table 6-8
Maximum Nitrate Plus Nitrite Concentrations for Perched Groundwater System Monitoring Wells in the Tijeras Arroyo Groundwater Area of Concern Where Concentrations Exceeded the EPA MCL during Calendar Years 2020 through 2024

	Maximum NPN Concentration, mg/L					
Monitoring Well	2020	2021	2022	2023	2024	Change from 2023 to 2024
TA2-W-19	12.1	12.8	12.7 J	12.7	13.5	Increased by 0.8
TA2-W-28	17.8	18.3	18.8 J	19.5 J	17.4	Decreased by 2.1
TJA-2	12.0	12.1	13.2	12.5	13.0	Increased by 0.5
TJA-5	16.7	16.4	16.4	14.5	14.2	Decreased by 0.3
TJA-7	22.7	23.0	22.2	21.9	21.9	No change

Notes:
mg/L = milligrams per liter
NPN = nitrate plus nitrite
TA2-W = Technical Area-II well
TJA = Tijeras Arroyo well

Figure 6-9 shows the NPN concentrations for the August/September 2024 sampling event because more monitoring wells were sampled during that event than during the February/March 2024 event. The NPN concentrations at four of the five PGWS monitoring wells (TA2-W-19, TA2-W-28, TJA-2, and TJA-7) are likely associated with historical discharges at SWMU 46 and the TA-II Discharges site.

The NPN concentrations at monitoring well TJA-5 are not suspected of being related to SNL/NM wastewater and septic water discharges because trichloroethene (TCE) and tetrachloroethene (PCE) have historically not been detected at the well. Historical wastewater discharges at SWMU 46 and the TA-II Discharges site contained TCE and PCE (SNL/NM, February 2018). Furthermore, the well is the most distant DOE/NNSA-owned well from potential SNL/NM nitrate sources.

The EPA MCL contour is dashed (queried) beyond the TAG AOC boundary because the NPN concentrations are much greater at some of the KAFB-owned PGWS monitoring wells located immediately south of the TAG AOC. For example, the NPN concentration at monitoring well ST105-MW006 was 60 mg/L in February 2024 (KAFB, January 2025). Since well installation in July 2013, NPN concentrations at ST105-MW0006 have ranged from 60 to 77 mg/L. NPN concentrations at nearby monitoring well KAFB-0623 have ranged from 28.1 to 63.2 mg/L since well installation in July 2004.

The NPN concentration trends (Figure 6-10) show that the NPN concentrations at the five PGWS monitoring wells have either been stable or decreasing for the last five years (CY 2020 through CY 2024). TA2-W-19, TA2-W-28, TJA-2, and TJA-7 show relatively stable NPN concentrations (Table 6-8). TJA-5 shows decreasing NPN concentrations.

The predicted years when four of the five PGWS monitoring wells (TA2-W-19, TA2-W-28, TJA-2, and TJA-7) will go dry (the water level will decline below the well screen) range from 2055 to 2088 (Table 6-9 and Figure 6-8). Earlier predictions for these four monitoring wells were used in the CME process to determine the duration of the MNA final remedy (SNL/NM, February 2018; SNL/NM, June 2023b). Monitoring well TJA-5 was not used to determine the duration of the MNA final remedy because it has a geochemical signature that indicates recent recharge (SNL/NM, February 2018; Copland, December 2024).

Table 6-9
Maximum Nitrate Plus Nitrite Concentrations and Trends for Perched Groundwater System Monitoring Wells in the Tijeras Arroyo Groundwater Area of Concern Where Concentrations Exceeded the EPA MCL in Calendar Year 2024

Well ID	Maximum NPN Concentration in CY 2024, mg/L	NPN Trend for the Last 5 Years	Predicted Year Monitoring Well Goes Dry
TA2-W-19	13.5	Stable	2056
TA2-W-28	17.4	Stable	2055
TJA-2	13.0	Stable	2088
TJA-5	14.2	Decreasing	2174*
TJA-7	21.9	Stable	2073

Notes:
*Monitoring well TJA-5 is located in the southeast corner of the TAG AOC and is impacted by recent recharge.
AOC = Area of Concern
CY = calendar year
ID = identifier
mg/L = milligrams per liter
NPN = nitrate plus nitrite
TA2-W = Technical Area-II well
TAG = Tijeras Arroyo Groundwater
TJA = Tijeras Arroyo well

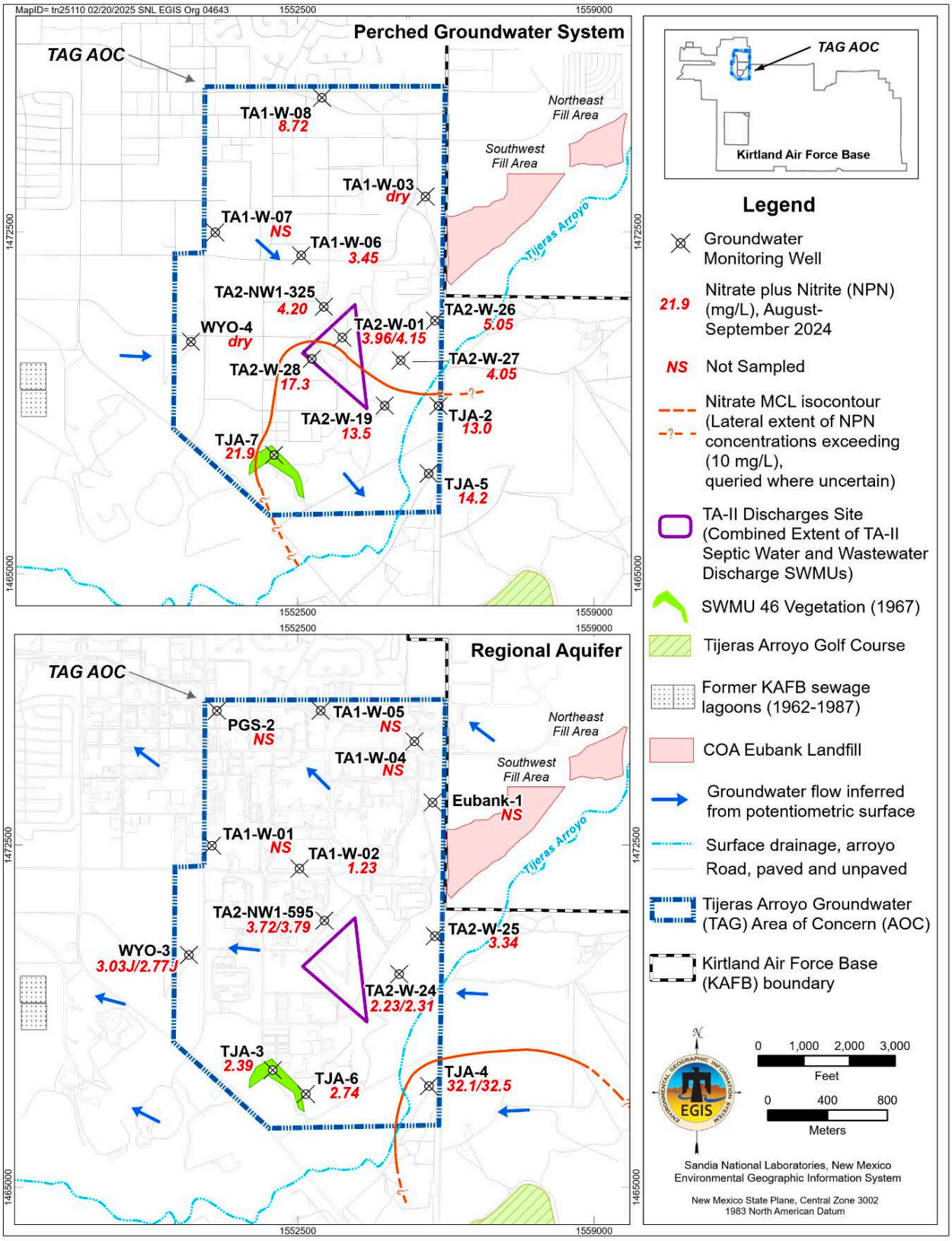


Figure 6-9
Nitrate Plus Nitrite Distribution in the Perched Groundwater System and Regional Aquifer in the Tijeras Arroyo Groundwater Area of Concern, August/September 2024

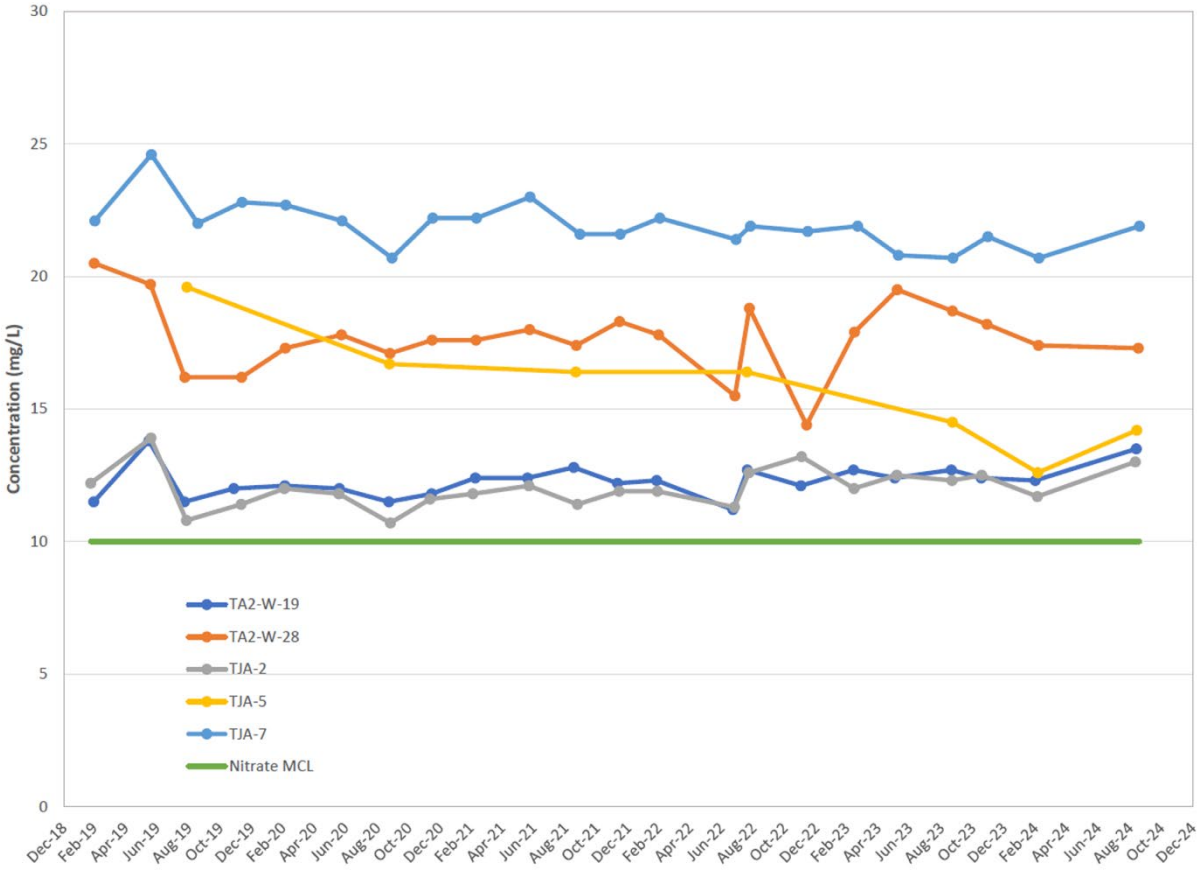


Figure 6-10
Nitrate Plus Nitrite Concentration Trend Plot for Perched Groundwater System Monitoring Wells in the Tijeras Arroyo Groundwater Area of Concern Where Concentrations Exceeded the EPA MCL during Calendar Years 2019 to 2024

Figures 6D-1 through 6D-6 present the NPN concentration trend plots for the five PGWS monitoring wells. Since October 2019, the NPN trends have been as follows:

- TA2-W-19 (Figure 6D-1): In CY 2024, the NPN concentrations in the environmental samples ranged from 12.3 to 13.5 mg/L. The NPN trend for the last five years has been stable, while the water level has consistently declined by approximately 0.37 ft/yr.
- TA2-W-28 (Figure 6D-2): In CY 2024, the NPN concentrations in the environmental samples ranged from 17.3 to 17.4 mg/L. The NPN trend for the last five years has been stable, while the water level has consistently declined by approximately 0.32 ft/yr. TA2-W-28 (first sampled in December 2014) is the replacement monitoring well for TA2-SW1-320 (last sampled in August 2014). TA2-W-28 is the farthest upgradient monitoring well in the TAG AOC with NPN concentrations above the EPA MCL.
- TJA-2 (Figure 6D-3): In CY 2024, the NPN concentrations in the environmental samples ranged from 11.7 to 13.0 mg/L. The NPN trend for the last five years has been stable, while the water level has consistently declined by approximately 0.25 ft/yr.
- TJA-5 (Figure 6D-4): In CY 2024, the NPN concentrations in the environmental samples ranged from 12.6 to 14.2 mg/L. The NPN trend for the last five years has been slightly decreasing, while the water level has consistently declined by approximately 0.12 ft/yr.
- TJA-7 (Figure 6D-5): In CY 2024, the NPN concentrations in the environmental samples ranged from 20.7 to 21.9 mg/L. The NPN trend for the last five years has been stable, while the water level has consistently declined by approximately 0.15 ft/yr.

Consistent with previous years, monitoring well TJA-4 had the highest NPN concentration (32.5 mg/L) of all the TAG AOC monitoring wells sampled in CY 2024 (Figure 6D-6). As Figure 6D-6 shows, the NPN trend for the last five years has been stable, while the water level has increased by 0.02 ft/yr. TJA-4 is located in the southeast corner of the TAG AOC and is screened in the Merging Zone above the Regional Aquifer. For reporting purposes, TJA-4 has historically been categorized as a Regional Aquifer monitoring well because its water level continues to increase in a manner similar to other monitoring wells that are screened in the Regional Aquifer. Saturation of the Merging Zone is probably the result of occasional surface water infiltration at Tijeras Arroyo and possibly due to irrigation at the KAFB Tijeras Arroyo Golf Course, which is located approximately 0.6 mi to the southeast. Elevated nitrate at TJA-4 likely reflects contributions from geogenic nitrate from vadose-zone sediments beneath the active Tijeras Arroyo channel and/or anthropogenic sources located upgradient of the TAG AOC, such as fertilizer usage at the KAFB Tijeras Arroyo Golf Course. Releases at SNL/NM SWMUs are not suspected of impacting the groundwater at TJA-4 because TCE and PCE have historically not been detected at the well. Based on the occurrence of the sweetener Neotame, Linhoff (July 2022) interpreted the likely nitrate source in TJA-4 environmental samples to be arroyo floodplain vadose zone nitrate mixed with anthropogenic nitrate.

To date (end of CY 2024), the maximum NPN concentration for the PGWS is 30.0 mg/L in the March 2011 environmental sample collected from monitoring well TJA-7, which is located at SWMU 46. The maximum NPN concentration for the Merging Zone is 38.4 mg/L in the May 2007 environmental sample collected from monitoring well TJA-4, which is located in the southeast corner of the TAG AOC near the KAFB Tijeras Arroyo Golf Course. The maximum NPN concentration for the Regional Aquifer exclusive of the Merging Zone is 4.24 mg/L in the June 2019 environmental sample collected from monitoring well TJA-3, which is located at SWMU 46.

6.6.2 Analytical Results for Waste Characterization Samples

The waste characterization samples (Table 6-6) were analyzed for volatile organic compounds (VOCs), major anions (bromide, chloride, fluoride, and sulfate), alkalinity, Target Analyte List (TAL) metals plus total uranium, gamma spectroscopy short list (americium-241, cesium-137, cobalt-60, and potassium-40), gross alpha/beta activity, and tritium to ensure that the wastewater generated by the sampling activities met the ABCWUA discharge limits (Chapter 1.0, Section 1.3.1.6). The wastewater was discharged to the sanitary sewer in accordance with ABCWUA requirements after the waste characterization results from each monitoring well were confirmed to be below the ABCWUA discharge limits.

Table 6C-2 presents the VOC results; Table 6C-3 lists the corresponding MDLs. Table 6C-4 presents the major anion and alkalinity results. Table 6C-5 presents the TAL metals and total uranium results. Table 6C-6 presents the gamma spectroscopy short list, gross alpha/beta activity, and tritium results.

6.6.3 Field Water Quality Parameter Measurements

Table 6C-7 presents the field water quality parameter measurements obtained at the end of purging and before sample collection (Chapter 1.0, Section 1.3.1.2) at each monitoring well during both sampling events. The field water quality parameters measured consisted of temperature, specific conductivity, oxidation-reduction potential, potential of hydrogen, turbidity, and dissolved oxygen. These parameters were measured to evaluate water chemistry stability and ensure the collection of representative groundwater samples.

6.7 Quality Control Results

This section summarizes the CY 2024 field quality control (QC) sample results and their impact on data quality. Chapter 1.0, Section 1.3 describes how the field QC samples were collected and prepared. Table 1-7 (Section 1.3.4) lists each field QC sample type and purpose.

The field QC samples included environmental duplicate, equipment blank, field blank, and trip blank samples.

The environmental duplicate samples (Table 6-6) were analyzed for NPN. Relative percent differences (RPDs) were calculated for NPN, which was detected in both duplicate and original environmental samples. The sample pairs for both sampling events showed good agreement based on RPDs of less than 1 to 9, significantly less than the RPD goal of 35.

The equipment blank samples were analyzed for all analytes (Table 6-6). The equipment blank sample results are as follows:

- February/March 2024 Sampling Event: Four equipment blank samples associated with monitoring wells TA1-W-06, TA1-W-08, TA2-NW1-325, and TJA-7 were collected before sampling of the wells began. NPN was not detected in any of the equipment blank samples.
- August/September 2024 Sampling Event: Six equipment blank samples associated with monitoring wells TA2-NW1-325, TA2-W-01, TA2-W-24, TA2-W-26, TJA-4, and WYO-3 were collected before sampling of the wells began. Acetone, alkalinity, bromodichloromethane, 2-butanone, chloride, chloroform, copper, dibromochloromethane, methylene chloride, NPN, sodium, and sulfate were detected in some of the equipment blank samples. No corrective action was necessary because these analytes were either not detected in the associated environmental or waste characterization samples or were detected in such samples at concentrations greater than five times the equipment blank sample result. Acetone in two equipment blank samples, chloride in one equipment blank sample, and methylene chloride in three equipment blank samples were qualified during data validation as not detected because the results were below the practical quantitation level (PQL) in the equipment blank samples and associated method blank or trip blank samples.

The field blank samples were analyzed for VOCs. The field blank sample results are as follows:

- February/March 2024 Sampling Event: Field blank samples were not collected at any monitoring wells because VOC analyses were not required. A field blank sample was collected from the deionized water used for decontamination and equipment blank sample collection and was analyzed for all analytes (Table 6-6). The results were used to internally verify the quality of the deionized water but were not used during data validation to qualify environmental or field QC sample results.
- August/September 2024 Sampling Event: Three field blank samples were collected for waste characterization purposes. Acetone, bromodichloromethane, chloroform, and dibromochloromethane were detected in the field blank samples. No corrective action was necessary because these analytes were not detected in the associated waste characterization samples. An additional field blank sample was collected from the deionized water used for decontamination and equipment blank sample collection and was analyzed for all analytes (Table 6-6). The results were used to internally verify the quality of the deionized water but were not used during data validation to qualify environmental or field QC sample results.

The trip blank samples were analyzed for VOCs. The trip blank sample results are as follows:

- February/March 2024 Sampling Event: Trip blank samples were not submitted because VOC analyses were not performed.
- August/September 2024 Sampling Event: A total of 26 trip blank samples were submitted and analyzed. Acetone and methylene chloride were detected. Methylene chloride was qualified during data validation as not detected because the results were below the PQL in the trip blank samples and associated method blank samples.

6.8 Variances and Nonconformances

All CY 2024 TAG AOC groundwater monitoring activities were performed and documented in accordance with the Consent Order and the CY 2024 Comprehensive Site-Wide Monitoring Plan, which is consistent with the TAG CMIP (Revised).

During the February/March 2024 sampling event, monitoring wells TA2-NW1-325 and TA2-W-26 purged dry before the minimum purge volume was removed. They were allowed to recover and then were sampled to ensure collection of the most representative groundwater samples possible given the low yields. During sampling, the turbidity for these two monitoring wells was 1.75 and 5.01 NTU, respectively (Table 6C-7).

During the August/September 2024 sampling event, monitoring well TA2-NW1-325 purged dry before the minimum purge volume was removed. It was allowed to recover and then was sampled to ensure collection of the most representative groundwater sample possible given the low yield. During sampling, the turbidity for this monitoring well was 1.75 NTU (Table 6C-7).

6.9 Summary and Conclusions

General

- The TAG AOC encompasses an area of approximately 1.82 mi^2 in the north-central part of KAFB.
- Groundwater investigations were initiated in 1992. The current TAG AOC monitoring well network consists of 19 monitoring wells used for water quality analysis and 25 monitoring wells used for water level measurements.
- Nitrate concentrations in groundwater can result from natural processes and anthropogenic sources.
- Nitrate is the COC for the TAG AOC.

Hydrogeology

- The PGWS is a thin, dissipating water-bearing zone that was artificially created by historical anthropogenic sources (septic and wastewater discharges). These types of wastewater discharges at SNL/NM ended in 1992.
- The PGWS above the Perching Horizon has a lateral extent of approximately 4.43 mi^2 in the north-central part of KAFB. Saturation of sediments above the Perching Horizon is not laterally continuous across the TAG AOC.
- Groundwater in the PGWS flows predominantly to the east and southeast. Water levels at the PGWS monitoring wells continue to decline as the system naturally dewaters.
- Groundwater from the PGWS is not pumped for potable use within or near the TAG AOC.
- From October 2019 to October 2024, the annual decline rates for the groundwater elevations at the PGWS monitoring wells with water in the well screens was 0.10 to 0.37 ft/yr. The average decline rate was approximately 0.24 ft/yr.
- By the end of CY 2024, two PGWS monitoring wells (TA1-W-03 and WYO-4) were dry; the estimated areas of dewatered sediments surrounding the two wells were 42 and 70 acres, respectively. The combined area (112 acres) comprises approximately 10% of the TAG AOC.

- Three of the 14 PGWS monitoring wells are predicted to be dry in 2030. Four of the 14 PGWS monitoring wells will be dry in 2040. Five of the 14 PGWS monitoring wells will be dry and approximately 40% of the PGWS in the TAG AOC will be dry by 2050. Only in the northwest and southeast corners of the TAG AOC will water be present in well screens after 2050.
- Groundwater in the Regional Aquifer flows to the west and northwest.
- From October 2019 to October 2024, average water level fluctuations at the Regional Aquifer monitoring wells, including the Merging Zone, ranged from approximately a negative 0.76 to a positive 0.59 ft/yr. The average rate for the 13 monitoring wells was approximately a positive 0.17 ft/yr.

Groundwater Sampling

- TAG AOC monitoring wells were sampled in February/March 2024 and August/September 2024. The environmental samples for both sampling events were analyzed for the COC – nitrate.
- For waste characterization purposes, TAG AOC monitoring wells were also sampled in August/September 2024 for VOCs, major anions, alkalinity, TAL metals plus total uranium, gamma spectroscopy short list, gross alpha/beta activity, and tritium.

NPN Results

- For the TAG AOC in CY 2024, the maximum NPN concentration was 21.9 mg/L in the September 2024 environmental sample collected from PGWS monitoring well TJA-7.
- NPN concentrations exceeded the EPA MCL of 10 mg/L in the environmental samples collected from five PGWS monitoring wells (TA2-W-19, TA2-W-28, TJA-2, TJA-5, and TJA-7).
- Over the past five years, the NPN concentrations at four of the five PGWS monitoring wells (TA2-W-19, TA2-W-28, TJA-2, and TJA-7) have been stable, while the NPN concentrations at PGWS monitoring well TJA-5 have been slightly decreasing.
- The lateral extent of NPN in the PGWS that exceeds the EPA MCL is comparable to that of previous years and is restricted to the southeast corner of the TAG AOC.
- The NPN concentrations at four of the five PGWS monitoring wells (TA2-W-19, TA2-W-28, TJA-2, and TJA-7) are the result of SNL/NM anthropogenic sources (wastewater and septic water discharges at SWMU 46 and the TA-II Discharges site).
- The NPN concentrations at PGWS monitoring well TJA-5 may be associated with either the infiltration of stormwater that contains sewage from properties located upstream of KAFB and/or naturally occurring (geogenic) nitrate.
- At Merging Zone monitoring well TJA-4 between the PGWS and the Regional Aquifer, the maximum NPN concentration in CY 2024 was 32.5 mg/L and is attributable to geogenic nitrate and/or anthropogenic release sites that are located upgradient of the TAG AOC.
- The maximum NPN concentration in CY 2024 for the Regional Aquifer exclusive of the Merging Zone was 3.79 mg/L at monitoring well TA2-NW1-595.

Well Inspections

The monitoring wells were inspected during each monitoring event (water level measurement and groundwater sampling event). No repairs were necessary. No unauthorized access was evident at any of the monitoring wells.

Remedial Progress

- Per the TAG CMI Plan (Revised), the cleanup goals of the MNA final remedy are for the NPN concentrations in the PGWS to decrease below the EPA MCL and/or for the PGWS to naturally dewater. The natural processes inherent in the MNA final remedy are evident in the TAG AOC.
- NPN concentration trends for the last five years have been either stable or slightly decreasing at the five PGWS monitoring wells where concentrations exceeded the EPA MCL.
- The water levels at PGWS monitoring wells across the TAG AOC are declining, indicating natural dewatering and reduction in the thickness of the saturated sediments.
- Full-scale implementation of the MNA final remedy began in CY 2024.

6.10 Summary of Future Activities

CY 2025 TAG AOC groundwater monitoring activities will include:

- Quarterly water level measurements at 25 TAG AOC monitoring wells.
- Semiannual and/or annual collection of groundwater samples from 19 TAG AOC monitoring wells.
- Collection of groundwater elevation data from the KAFB ERP, COA EHD, and U.S. Geological Survey.
- Annual reporting of the monitoring activities and results in the CY 2025 annual groundwater monitoring report.
- Submittal of the CY 2026 comprehensive site-wide groundwater monitoring plan to the NMED in April 2025.
- Full-scale implementation of the MNA final remedy. The findings will be presented in the CY 2025 annual groundwater monitoring report.

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Attachment 6A
Historical Timeline of the Tijeras Arroyo Groundwater Area of Concern

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Table 6A-1
Historical Timeline of the Tijeras Arroyo Groundwater Area of Concern

Year	Event	Reference
1928	Land-use development on the East Mesa began in 1928 when the public Albuquerque Airport was built. Renamed Oxnard Field in 1929, the airport was used until late 1939 when the vicinity of Oxnard Field was purchased by the federal government for use as an Army Air Depot Training Station, later to be known as Sandia Base.	Freeman, 2016; CE2 Corporation, September 2016
1939	In 1939, public airline service was moved approximately four miles to the west of Oxnard Field where the Albuquerque Municipal Airport was built. Using the municipal set of runways, the Albuquerque Army Air Base began operations in 1941.	www.econtent.unm.edu, 2016; Wikipedia, 2016
1945	"Z Division" of the Manhattan Engineers District, an extension of the original Los Alamos Laboratory, was established at Sandia Base in the area that would become known as TA-I.	Furman, April 1990
1946	After World War II, the old Oxnard Field runways and a new extensive grid of taxiways were used for parking military aircraft. Starting in 1946, the War Assets Administration managed the sale or the dismantlement and smelting of approximately 2,250 surplus military aircraft.	www.militarymediainc.com, 2016
1947	Wastewater and septic-water discharges begin began at TA-II. All discharges to the ground surface or buried leach fields ended in 1992.	SNL/NM, November 2005
1948	Wastewater and possibly septic-water discharges associated with TA-I began at SWMU 46. All discharges to ground surface at the outfall ditches ceased in 1974.	SNL/NM, November 2005
1949	The independent Sandia Laboratory was established. Existing buildings in TA-I were remodeled. New buildings in TA-I and TA-II were constructed.	Furman, April 1990
1977	Construction of TA-IV accelerator facilities began in 1977. All buildings use modern wastewater and septic disposal systems. No discharges to the ground were allowed.	SNL/NM, November 2005
1984	DOE created CEARP to evaluate potential release sites at SNL/NM.	DOE, September 1987
1988	The SNL/NM ER Project was created and began conducting investigations using the CEARP list of sites.	SNL/NM, March 1995a
1992	ER Project started to investigate groundwater at TA-II. The Perched Groundwater System was discovered with the installation of monitoring wells TA2-SW1-320, TA2-NW1-325, and TA2-NW1-595. The presence of the Regional Aquifer was previously known from base-wide studies.	SNL/NM, March 1995a
1994	Installed groundwater monitoring wells TA2-W-01 and TJA-2.	SNL/NM, March 1995a
1994	First detection of TCE in a groundwater sample from a SNL/NM well near Tijeras Arroyo. The October 1994 sample from monitoring well TA2-W-01 contained TCE at 1 µg/L.	SNL/NM, March 1995b
1995	Installed nested groundwater monitoring wells WYO-1 and WYO-2 in a single borehole. Installed groundwater monitoring wells PGS-2 and TA2-W-19.	SNL/NM, March 1996a
1995	First TCE exceedance of the U.S. Environmental Protection Agency MCL of 5 µg/L. The November 1995 groundwater sample from monitoring well TA2-W-19 contained TCE at 8.1 µg/L.	SNL/NM, March 1996b
1995	Comprehensive study of the geologic and hydrogeologic setting for SNL/NM and KAFB area completed.	GRAM and Lettis, December 1995
1996	Sandia North Groundwater Investigation Plan submitted to the NMED.	SNL/NM, March 1996a
1996	Shallow (Perched Groundwater System) Water-Bearing Zone Hydrologic Evaluation report prepared for aquifer parameters.	Wolford, September 1996
1996	Pressure transducer program conducted at four Perched Groundwater System monitoring wells (TA2-NW1-325, TA2-SW1-320, TA2-W-01, and TA2-W-19), two Regional Aquifer monitoring wells (PGS-2, TA2-NW1-595), and one production well (KAFB-5).	SNL/NM March 1998

See notes at end of table.

Table 6A-1 (continued)
Historical Timeline of the Tijeras Arroyo Groundwater Area of Concern

Year	Event	Reference
1996	Installed soil-vapor monitoring wells TA2-VW-20 and TA2-VW-21.	IT, January 1997
1997	Sandia North Geological Investigation Project Report was submitted to the NMED.	Fritts and Van Hart, March 1997
1997	Installed groundwater monitoring wells TA1-W-01 and TA2-W-25.	SNL/NM, March 1998
1997	Downhole geophysical surveying was conducted on 21 SNL/NM and USAF monitoring wells near Tijeras Arroyo.	SNL/NM, March 1998
1998	Installed groundwater monitoring wells TA1-W-02, TA1-W-03, TA1-W-04, TA1-W-05, TA1-W-06, TA1-W-07, TA2-W-24, TA2-W-26, TA2-W-27, TJA-3, TJA-4, and TJA-5.	SNL/NM, June 2000
1998	Revision of the 1995 comprehensive study of the geologic and hydrogeologic setting for SNL/NM and KAFB area was completed.	SNL/NM, February 1998
1999	Colloidal borescope investigation was performed on 18 Perched Groundwater System monitoring wells.	AquaVISION, July 1999
1999	Structural interpretation was conducted using USGS aeromagnetic survey.	Van Hart et al., October 1999
2000	Project name at SNL/NM was changed from the “Sandia North Groundwater Investigation” to the “Tijeras Arroyo Groundwater” or TAG Investigation.	Collins, December 2000
2000	At NMED direction, the TAG High Performing Team (HPT) held its first meeting in October 2000.	SNL/NM, June 2003
2001	Installed groundwater monitoring wells TA1-W-08, TJA-6, and TJA-7.	SNL/NM, November 2002
2001	Installed soil-vapor monitoring wells 46-VW-01, 46-VW-02, and 227-VW-01.	SNL/NM, November 2002
2001	Geologic model of the Perched Groundwater System was updated.	Van Hart, June 2001
2001	Geochemical modeling of the Perched Groundwater System was conducted.	Brady and Domski, 2001
2001	Capture zone analysis conducted for production wells located outside the TAG Investigation area.	SNL/NM, February 2001
2001	Pressure transducer study was conducted using 19 monitoring wells (11 wells are screened in Perched Groundwater System and 8 wells are screened in Regional Aquifer).	SNL/NM, August 2001
2001	Installed replacement groundwater monitoring wells WYO-3 and WYO-4. Plugged and abandoned wells WYO-1 and WYO-2.	SNL/NM, June 2003
2002	Completed the calibration of the three-dimensional groundwater flow modeling of the TAG vicinity using the numerical code FEMWATER.	BGW, September 2002
2002	TAG Continuing Investigation Report was submitted to the NMED.	SNL/NM, November 2002
2003	Updated the interpretation of the subsurface geology at KAFB, including the TAG area.	Van Hart, June 2003
2003	TAG Investigation Work Plan submitted to the NMED. The plan discussed the tasks that SNL/NM personnel proposed to conduct.	SNL/NM, June 2003
2003	TAG Investigation Work Plan was approved by the NMED.	NMED, September 2003
2003	Installed soil-vapor monitoring wells 159-VW-01, 165-VW-01, 1004-VW-01, and 1052-VW-01.	SNL/NM, October 2003
2003	Final meeting of TAG HPT was held in October 2003. Twenty meetings were held during the three-year period (2000 to 2003). Personnel from SNL/NM, DOE/NNSA, KAFB Installation Restoration Program, NMED Groundwater Quality Bureau, NMED Hazardous Waste Bureau, NMED Oversight Bureau, U.S. Environmental Protection Agency Region 6, Bernalillo County, and the City of Albuquerque Environmental Health Department participated.	Copland and Skelly, October 2003
2004	Slug testing was conducted at five Perched Groundwater System monitoring wells and five Regional Aquifer monitoring wells.	Skelly et al., May 2004
2004	The Compliance Order on Consent identified the TAG Investigation as an AOC and required the preparation of a CME report for the TAG AOC.	NMED, April 2004

See notes at end of table.

Table 6A-1 (continued)
Historical Timeline of the Tijeras Arroyo Groundwater Area of Concern

Year	Event	Reference
2004	TAG CME Work Plan was submitted to the NMED.	SNL/NM, July 2004
2004	Installed soil-vapor monitoring wells TAG-SV-01, TAG-SV-02, TAG-SV-03, TAG-SV-04, and TAG-SV-05.	SNL/NM, November 2005
2004	Stable isotope ($\delta^{15}N$) analyses conducted for five Perched Groundwater System monitoring wells.	SNL/NM, November 2004
2004	TAG CME Work Plan was approved by the NMED.	NMED, October 2004
2005	TAG CME Report was submitted to the NMED. SNL/NM did not receive any NMED comments concerning the report.	SNL/NM, August 2005
2005	TAG Investigation Report (analogous to a CCM) was submitted to the NMED.	SNL/NM, November 2005
2006	Plugged and abandoned soil-vapor monitoring well TAG-SV-03.	Skelly, November 2006
2008	NMED issued a NOD on the TAG Investigation Report.	NMED, August 2008
2009	Response to the August 2008 NOD for the TAG Investigation Report submitted to the NMED.	SNL/NM, February 2009
2009	NMED issued a second NOD concerning the TAG Investigation Report.	NMED, August 2009
2010	Response to the second NOD concerning the TAG Investigation Report submitted to the NMED.	SNL/NM, January 2010
2010	NMED issued a Notice of Approval for the TAG Investigation Report.	NMED, February 2010
2012	Plugged and abandoned soil-vapor monitoring wells 159-VW-01, 165-VW-01, 227-VW-01, 1004-VW-01, and 1052-VW-01.	SNL/NM, March 2013
2012	Groundwater samples for dual isotopes analyses ($\delta^{15}N$ versus $\delta^{18}O$) were collected from five Regional Aquifer monitoring wells.	Madrid et al., June 2013
2014	Installed replacement groundwater monitoring well TA2-W-28. Plugged and abandoned nearby groundwater monitoring well TA2-SW1-320.	SNL/NM, April 2015
2015	Meeting was held between personnel from SNL/NM, DOE/NNSA, and NMED for discussing the schedule (milestones) for report submittals concerning the TAG AOC, the TA-V Groundwater AOC, and the Burn Site Groundwater AOC.	DOE, March 2016
2016	NMED milestones letter required that an "Updated CCM and CME Report" for the TAG AOC be submitted in December 2016.	NMED, April 2016
2016	A combined and updated TAG CCM/CME Report (dated December 2016) was submitted to the NMED. The transmittal letter was dated November 23, 2016. The sole constituent of concern was nitrate.	SNL/NM, December 2016, DOE, November 2016
2017	NMED issued a disapproval letter for the TAG CCM/CME Report. NMED requested submittal of a revised report before November 30, 2017.	NMED, May 2017
2017	The USGS collected groundwater samples from 33 monitoring wells located on KAFB including 7 wells in the TAG AOC.	Linhoff, July 2022
2017	Requested a time extension for submittal of the Revised TAG CCM/CME Report.	DOE, September 2017
2017	NMED approved the time extension request. Submittal date for the Revised TAG CCM/CME Report was set for February 15, 2018.	NMED, October 2017
2017	Responsibility for well WYO-4 was transferred to the KAFB ERP.	DOE, September 2017; NMED December 2018
2018	The Revised TAG CCM/CME Report was submitted to the NMED. The sole constituent of concern was nitrate.	SNL/NM, February 2018
2018	Slug testing was conducted at replacement monitoring well TA2-W-28 to determine the hydraulic conductivity of the screened sediments.	Skelly et al., August 2018
2018	Status and locations of KAFB production wells were evaluated. More accurate coordinates were determined using field inspections and ortho-rectified aerial photography.	Copland, July 2018
2019	BaroBall (passive venting device) installed at well TJA-2 on April 26, 2019.	SNL/NM, June 2020
2019	Conducted extensive review of potential nitrate-release sites located in the north-central portion of KAFB and adjacent Albuquerque.	SNL/NM, December 2019

See notes at end of table.

Table 6A-1 (continued)
Historical Timeline of the Tijeras Arroyo Groundwater Area of Concern

Year	Event	Reference
2020	Personnel from DOE/NNSA, SNL/NM, and NMED met virtually to discuss NMED's ongoing review of the Revised TAG CCM/CME Report (SNL/NM, February 2018) on September 23, 2020.	SNL/NM, June 2021
2020	Video logging at well TA2-W-26 was conducted on December 18, 2020. BaroBall installed at well TA2-W-26 on December 21, 2020.	SNL/NM, June 2021
2021	Personnel from DOE/NNSA, SNL/NM, and NMED met virtually on May 11, 2021 to discuss NMED's ongoing review of the Revised TAG CCM/CME Report (SNL/NM, February 2018).	SNL/NM, June 2022
2021	Collected soil-vapor samples from monitoring wells TAG-SV-04 and TAG-SV-05 on May 14, 2021.	SNL/NM, June 2022
2022	Virtual meeting between SNL/NM, DOE/NNSA, and NMED personnel on June 30, 2022.	SNL/NM, June 2023b
2022	NMED issued Public Notice No. 22-05 on August 5, 2022. The Public Notice approved the Revised TAG CCM/CME Report (SNL/NM, February 2018).	NMED, August 2022
2023	NMED issued the Final Remedy Decision for the TAG AOC on January 6, 2023. NMED selected monitored natural attenuation (MNA) as the final remedy for elevated nitrate concentrations in the Perched Groundwater System.	NMED, January 2023
2023	The Comprehensive Site-wide Groundwater Monitoring Plan CY 2024 was submitted. This is the first of a series.	SNL/NM, April 2023a
2023	TAG Corrective Measures Implementation (CMI) Plan submitted to the NMED on June 22, 2023.	SNL/NM, June 2023a
2023	The Comprehensive Site-wide Groundwater Monitoring Plan (Revised) CY 2024 was submitted.	SNL/NM, April 2023b
2023	NMED issued Approval with Modification on the TAG CMI Plan on October 26, 2023.	NMED, October 2023
2023	Video logging conducted on monitoring wells PGS-2, TA1-W-05, and TA1-W-08 in September 2023.	SNL/NM, July 2024
2023	Video logging conducted on monitoring wells TA1-W-06, TA2-W-01, TA2-W-24, TA2-W-25, TA2-W-26, TA2-W-28, TJA-5, and TJA-7 in October 2023.	SNL/NM, July 2024
2023	Video logging conducted on monitoring wells TA1-W-02, TA1-W-07, TA2-NW1-325, TA2-NW1-595, TA2-W-19, TA2-W-27, TJA-2, and TJA-3 in November 2023.	SNL/NM, July 2024
2023	Well-capacity tests conducted on monitoring wells TA1-W-07 and TA2-NW1-325 in November 2023.	SNL/NM, July 2024
2023	Virtual meeting held between DOE/NNSA, SNL/NM, and NMED personnel on December 13, 2023 to discuss the feasibility of sampling monitoring wells TA1-W-07 and TA2-NW1-325.	SNL/NM, July 2024
2024	The June 2023 TAG CMI Plan (Revised) June 2023 was submitted to NMED in January 2024.	SNL/NM, December 2023, DOE, January 2024
2024	NMED approval of the TAG CMI Plan (Revised).	NMED, March 2024
2024	Best management practices began in January for the MNA final remedy.	This report
2024	The Comprehensive Site-wide Groundwater Monitoring Plan CY 2025 was submitted.	SNL/NM, April 2024
2024	NMED approved the Comprehensive Site-wide Groundwater Monitoring Plan CY 2025.	NMED, July 2024
2024	Monitoring well PGS-2 was resurveyed for the top of casing measurement point.	This Report
2024	Continued to conduct groundwater monitoring at the TAG AOC.	This Report

See notes at end of table.

Table 6A-1 (concluded)
Historical Timeline of the Tijeras Arroyo Groundwater Area of Concern

Notes:

$\delta^{15}N$	= delta 15 nitrogen
$\delta^{18}O$	= delta 18 oxygen
µg/L	= microgram(s) per liter
AOC	= Area of Concern
BGW	= Balleau Groundwater Inc.
CCM	= Current Conceptual Model
CEARP	= Comprehensive Environmental Assessment and Response Program
CME	= Corrective Measures Evaluation
CY	= calendar year
DOE	= U.S. Department of Energy
ER	= Environmental Restoration
ERP	= Environmental Restoration Program
FEMWATER	= Finite Element Model of Water
GRAM	= GRAM, Inc.
HPT	= High Performing Team
IT	= IT Corporation
KAFB	= Kirtland Air Force Base
Lettis	= William Lettis & Associates, Inc.
MNA	= monitored natural attenuation
MCL	= maximum contaminant level
NMED	= New Mexico Environment Department
NNSA	= National Nuclear Security Administration
NOD	= Notice of Disapproval
PGS	= Parade Ground South
SNL/NM	= Sandia National Laboratories, New Mexico
SV	= Soil Vapor
SWMU	= Solid Waste Management Unit
TA	= Technical Area
TA1-W	= Technical Area-I well
TA2-NW	= Technical Area-II northwest well
TA2-SW	= Technical Area-II southwest well
TA2-W	= Technical Area-II well
TAG	= Tijeras Arroyo Groundwater
TCE	= trichloroethene
TJA	= Tijeras Arroyo Well
USAF	= U.S. Air Force
USGS	= U.S. Geological Survey
VW	= Vapor Well
WYO	= Wyoming Boulevard Well

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Attachment 6B
Tijeras Arroyo Groundwater Area of Concern Hydrographs

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Attachment 6B Hydrographs

Figure 6B-1 Hydrographs for Monitoring Wells TA1-W-01 and TA1-W-05 ..... 6B-5

Figure 6B-2 Hydrographs for Monitoring Wells TA1-W-02 and TA1-W-04 ..... 6B-6

Figure 6B-3 Hydrograph for Monitoring Well TA2-NW1-595 ..... 6B-7

Figure 6B-4 Hydrographs for Monitoring Wells PGS-2 and WYO-3 ..... 6B-8

Figure 6B-5 Hydrographs for Monitoring Wells TJA-3 and TJA-6 ..... 6B-9

Figure 6B-6 Hydrographs for Monitoring Wells TA2-W-01, TA2-W-19, TA2-W-26, and TA2-W-27 ..... 6B-10

Figure 6B-7 Hydrographs for Monitoring Wells TA2-W-28, TJA-2, and TJA-7 ..... 6B-11

Figure 6B-8 Hydrograph for Monitoring Well TJA-4 ..... 6B-12

Figure 6B-9 Hydrograph for Monitoring Wells TA1-W-06 and TA1-W-08 ..... 6B-13

Figure 6B-10 Hydrographs for Monitoring Wells TA1-W-03 and WYO-4 ..... 6B-14

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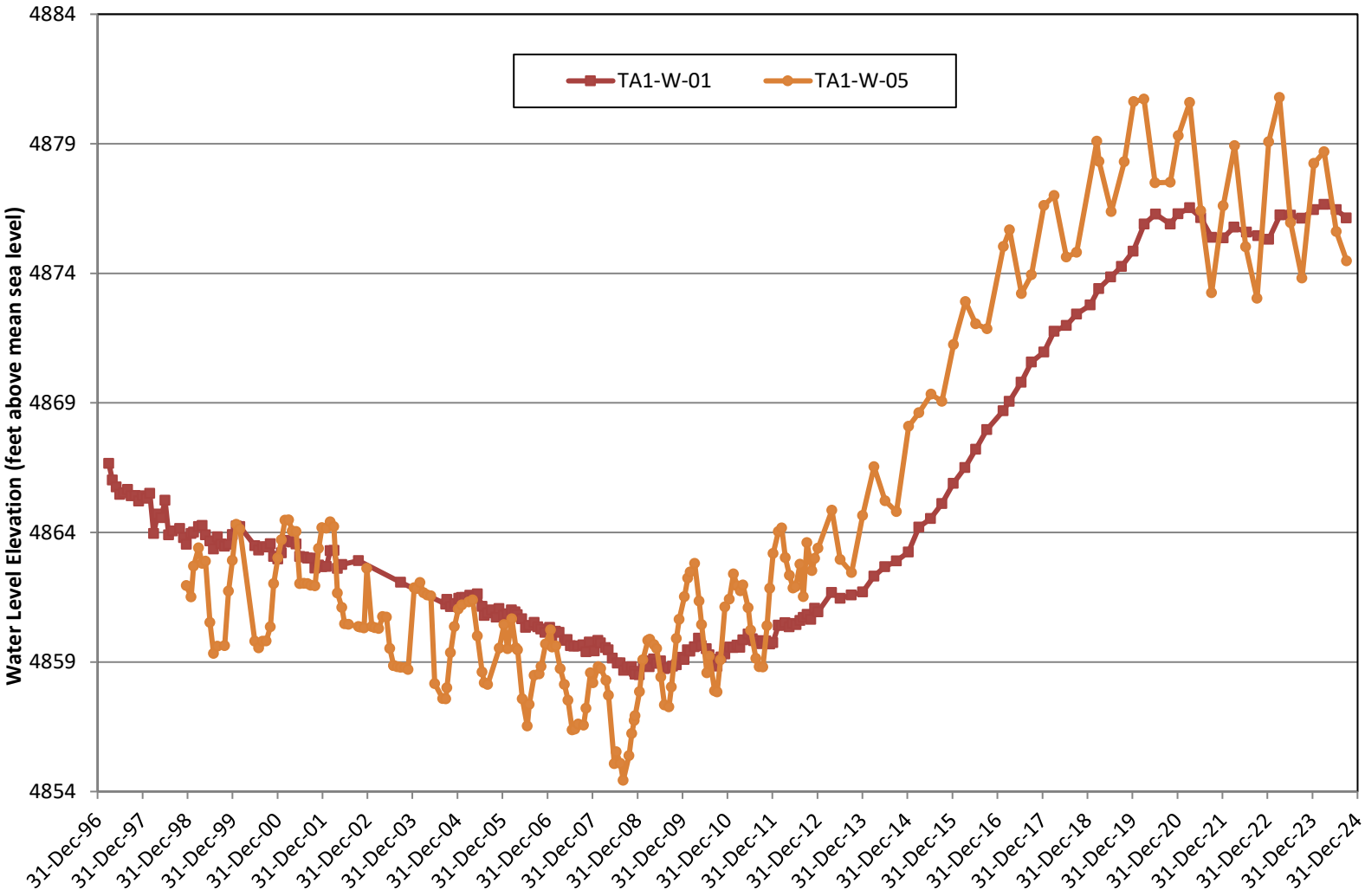


Figure 6B-1
Hydrographs for Monitoring Wells TA1-W-01 and TA1-W-05

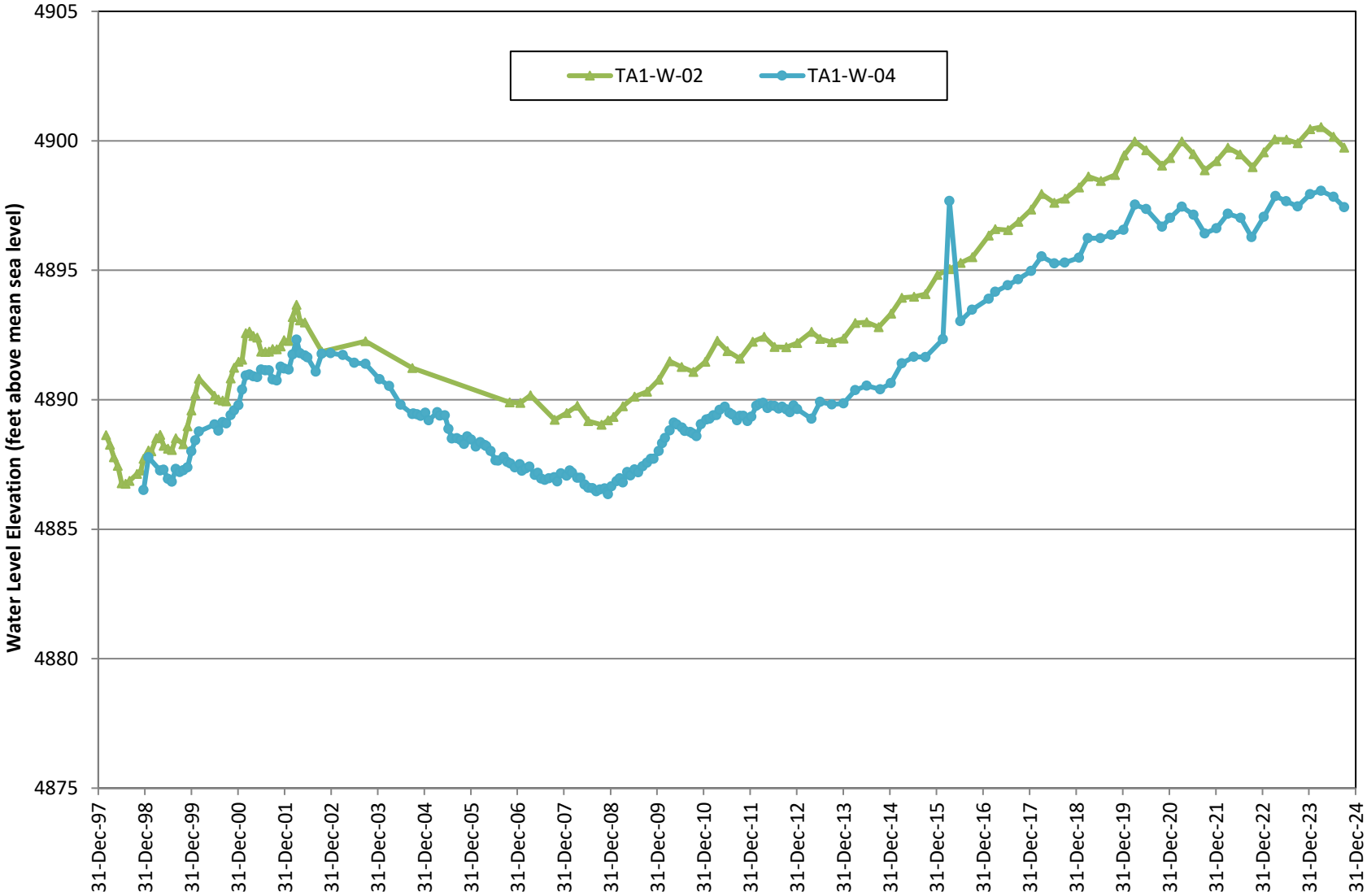


Figure 6B-2
Hydrographs for Monitoring Wells TA1-W-02 and TA1-W-04

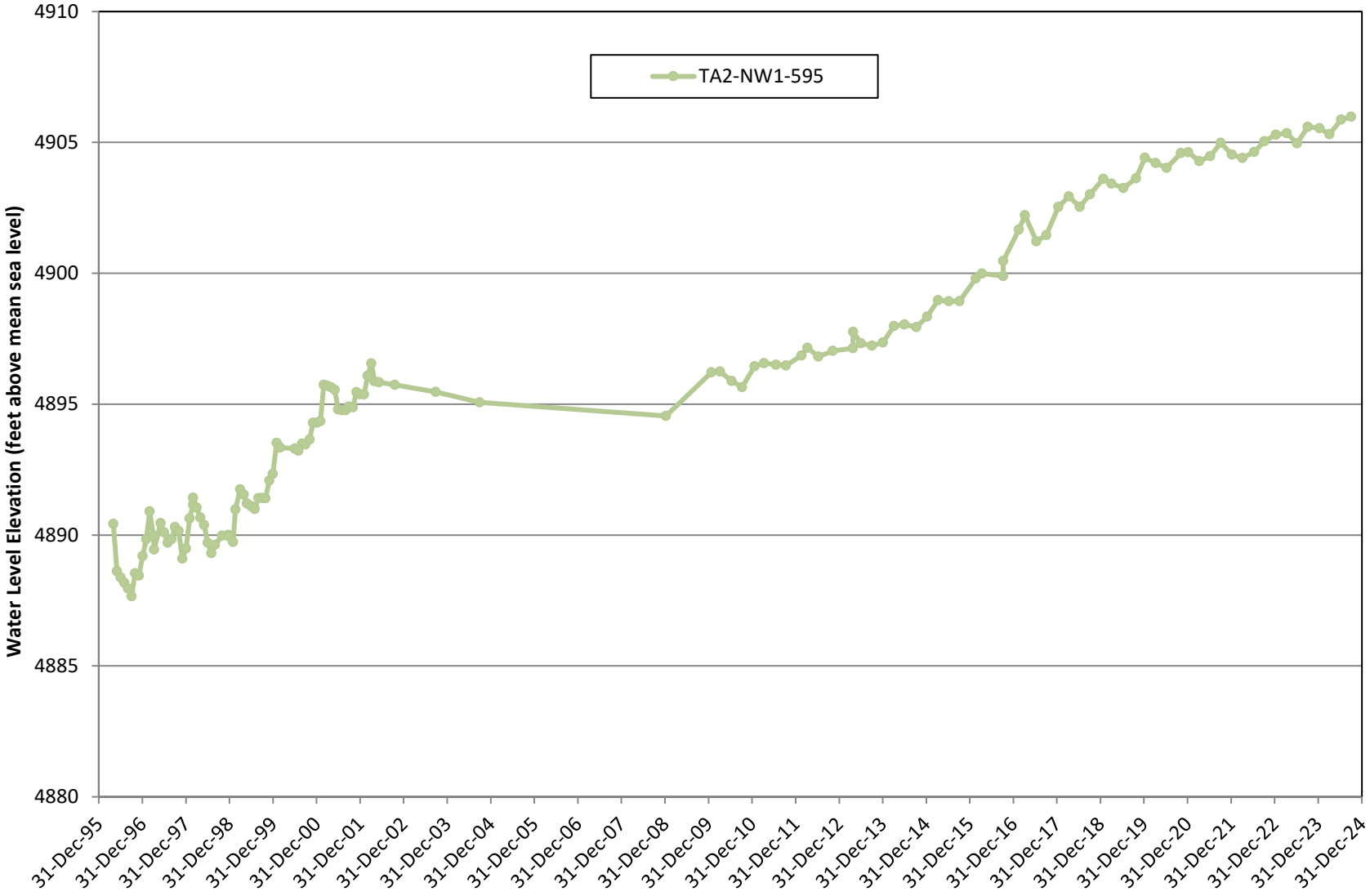


Figure 6B-3
Hydrograph for Monitoring Well TA2-NW1-595

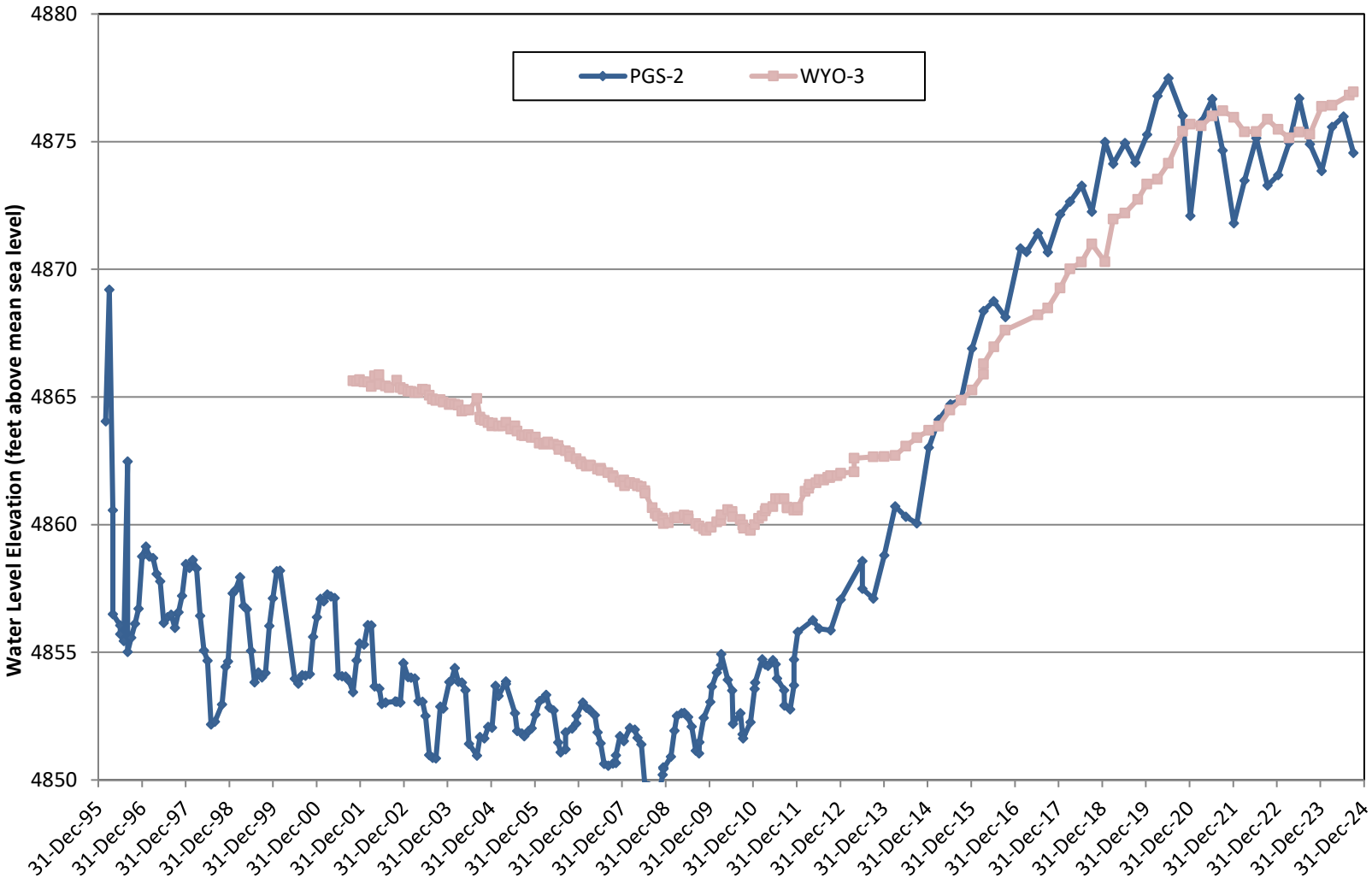


Figure 6B-4
Hydrographs for Monitoring Wells PGS-2 and WYO-3

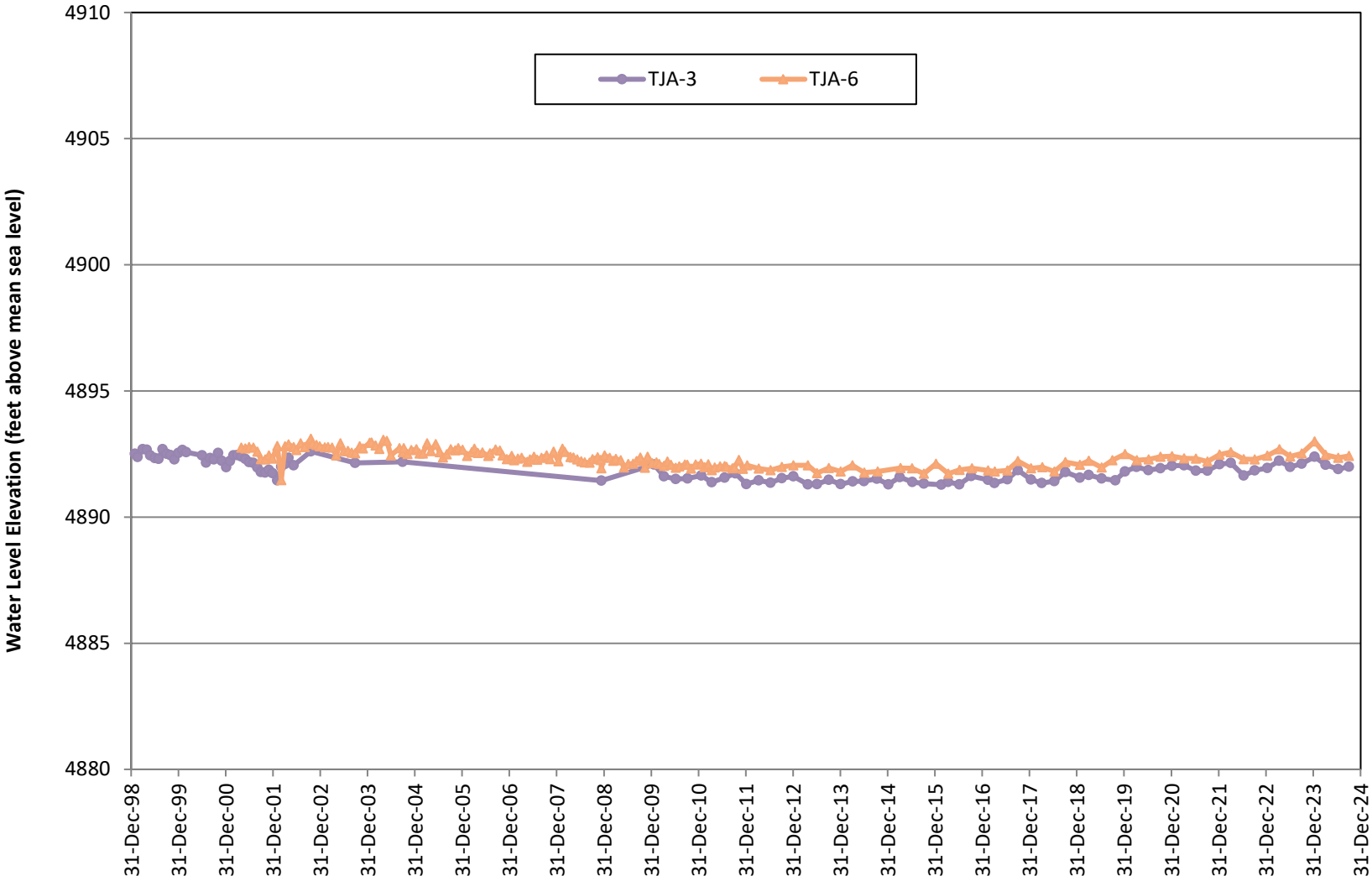


Figure 6B-5
Hydrographs for Monitoring Wells TJA-3 and TJA-6

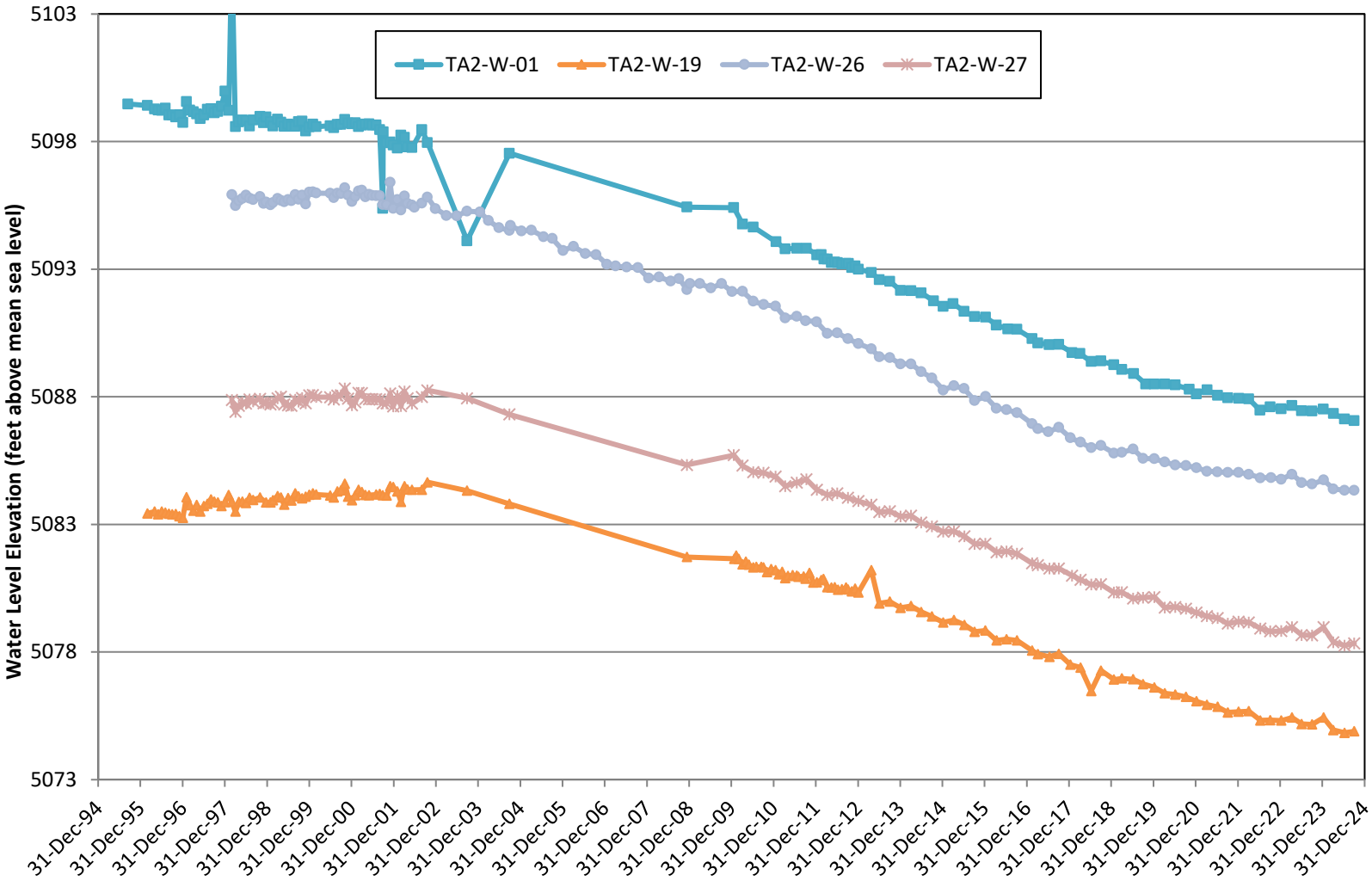


Figure 6B-6
Hydrographs for Monitoring Wells TA2-W-01, TA2-W-19, TA2-W-26, and TA2-W-27

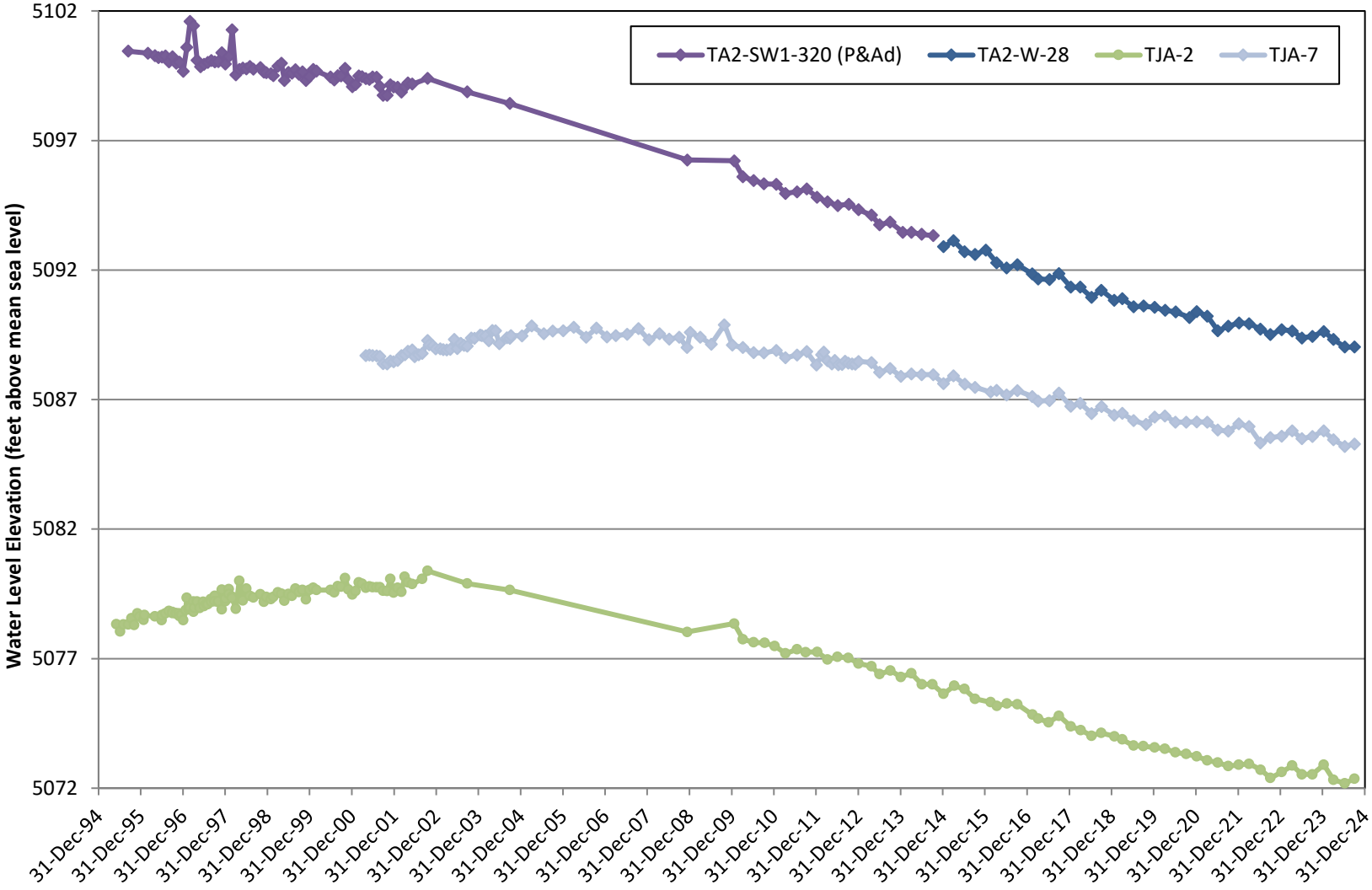


Figure 6B-7
Hydrographs for Monitoring Wells TA2-W-28, TJA-2, and TJA-7

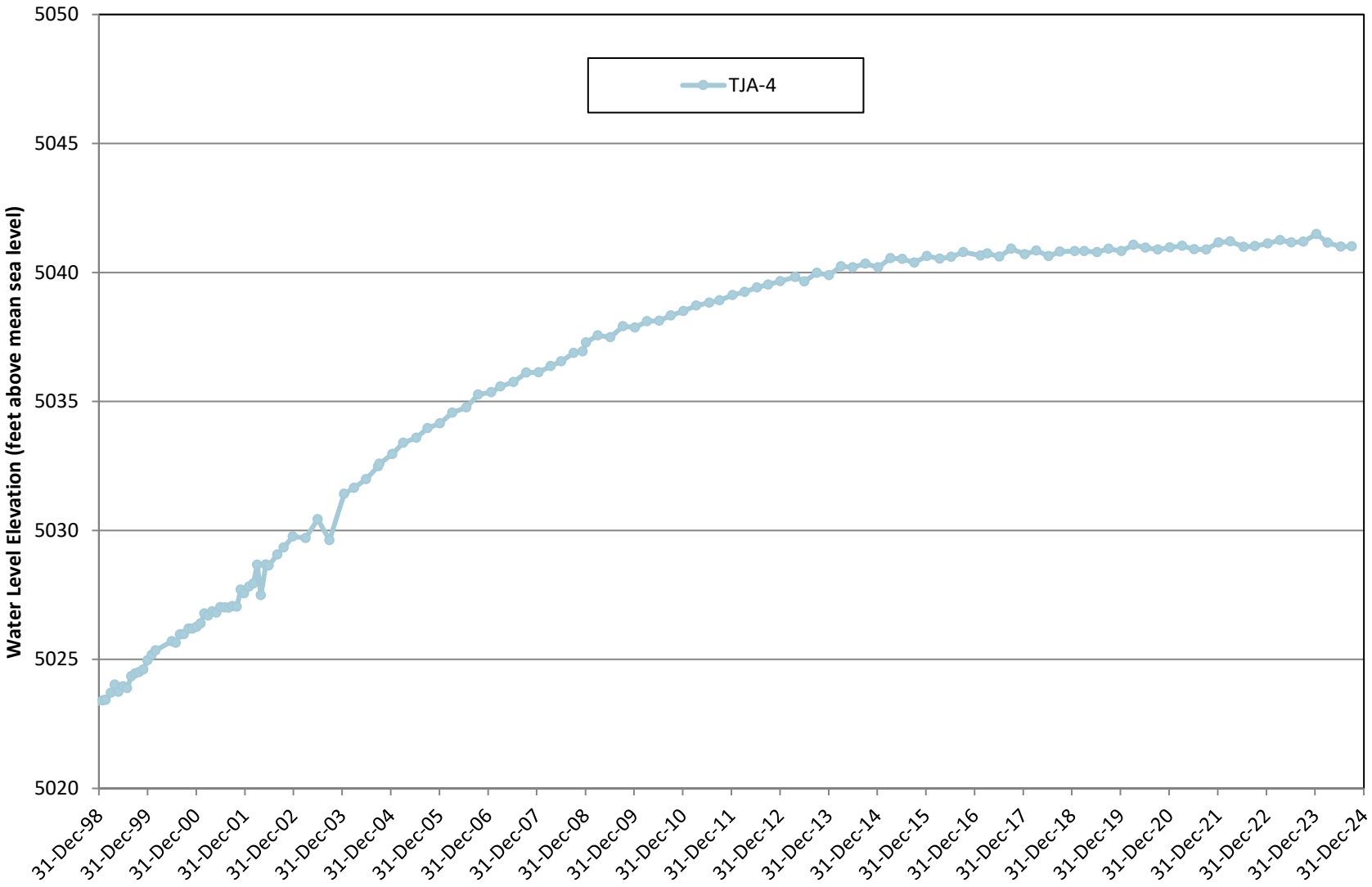


Figure 6B-8
Hydrograph for Monitoring Well TJA-4

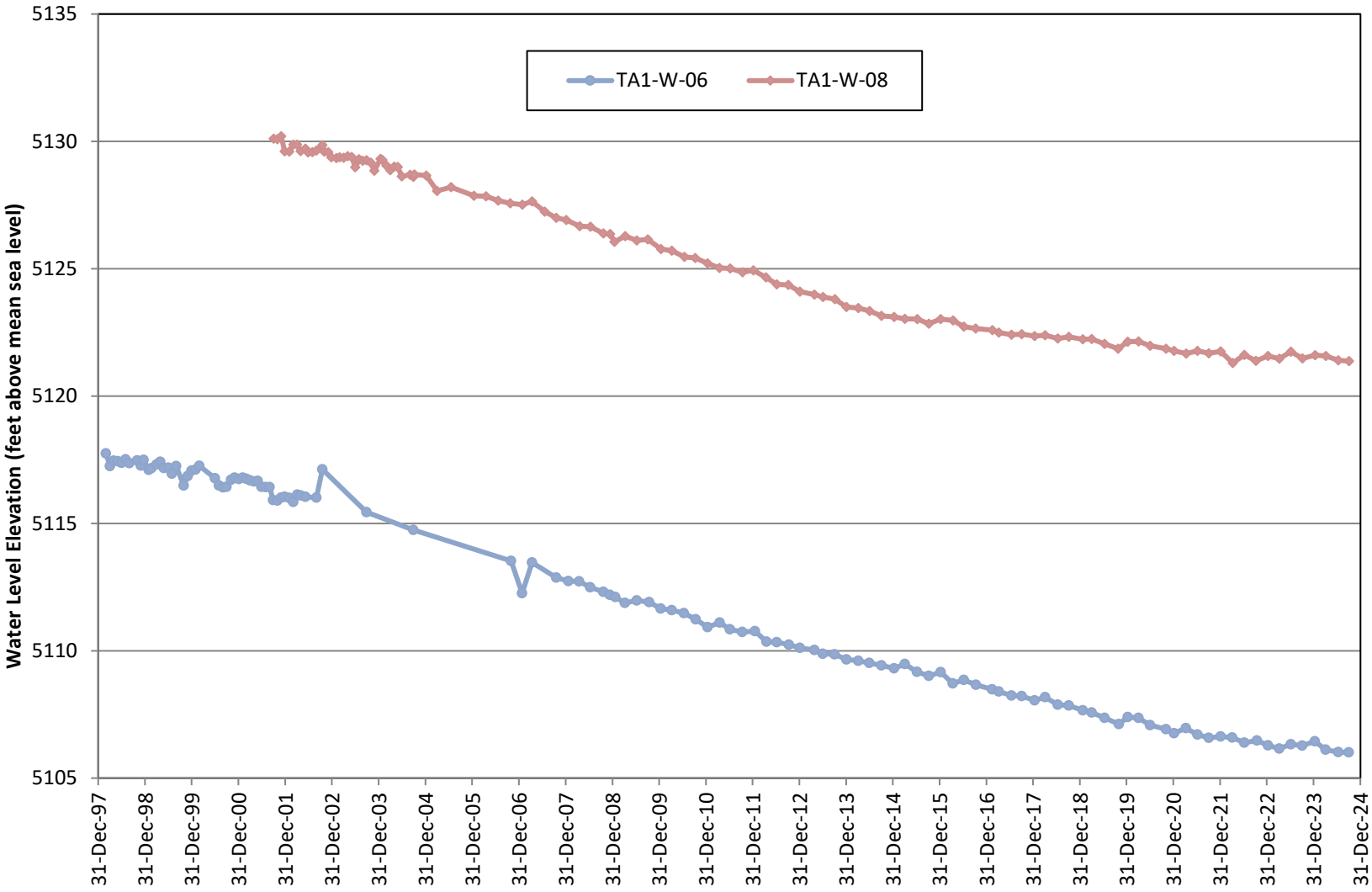


Figure 6B-9
Hydrographs for Monitoring Wells TA1-W-06 and TA1-W-08

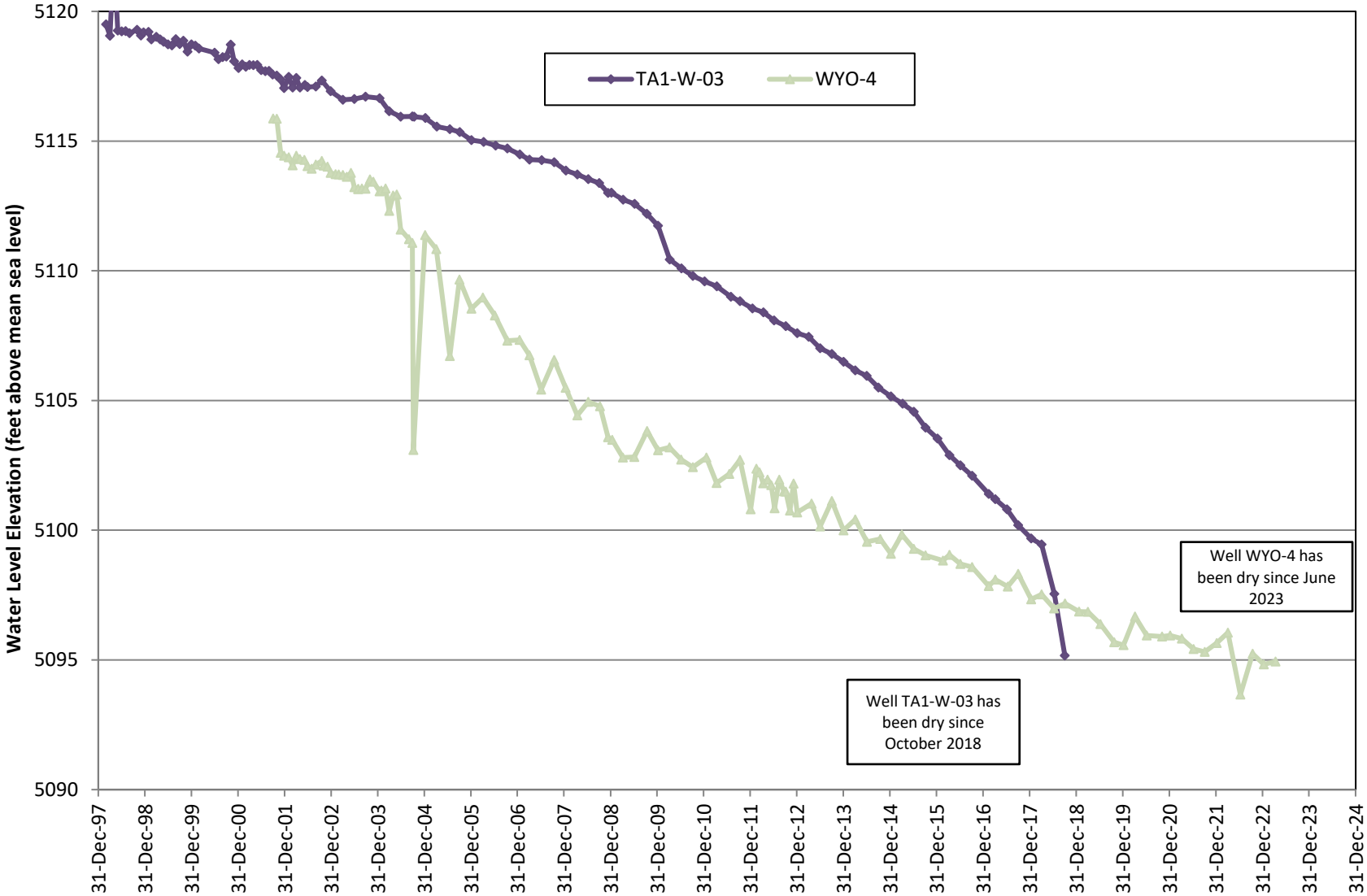


Figure 6B-10
Hydrographs for Monitoring Wells TA1-W-03 and WYO-4

Attachment 6C
Tijeras Arroyo Groundwater Area of Concern
Analytical Results Tables

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Attachment 6C Tables

Table 6C-1 Summary of Nitrate plus Nitrite Results for Environmental Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 6C-5

Table 6C-2 Summary of Detected Volatile Organic Compounds for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024..... 6C-8

Table 6C-3 Method Detection Limits for Volatile Organic Compounds for Waste Characterization Samples (EPA Method[g] 8260D), Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 6C-9

Table 6C-4 Summary of Major Anion and Alkalinity Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024..... 6C-10

Table 6C-5 Summary of TAL Metals and Total Uranium Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024..... 6C-14

Table 6C-6 Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, and Tritium Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024..... 6C-33

Table 6C-7 Summary of Field Water Quality Parameter Measurements, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 6C-37

Notes for Tijeras Arroyo Groundwater Area of Concern Analytical Results Tables 6C-38

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Table 6C-1
Summary of Nitrate plus Nitrite Results for Environmental Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result [a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL[d] (mg/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
TA1-W-06 20-Feb-24	Nitrate plus nitrite	3.68	0.170	0.500	10.0			121813-001	EPA 353.2
TA1-W-06 (Duplicate) 20-Feb-24	Nitrate plus nitrite	3.66	0.0850	0.250	10.0			121814-001	EPA 353.2
TA1-W-08 28-Feb-24	Nitrate plus nitrite	8.75	0.425	1.25	10.0			121819-001	EPA 353.2
TA1-W-08 (Duplicate) 28-Feb-24	Nitrate plus nitrite	8.75	0.425	1.25	10.0			121820-001	EPA 353.2
TA2-NW1-325 19-Feb-24	Nitrate plus nitrite	4.67	0.170	0.500	10.0			121810-001	EPA 353.2
TA2-NW1-325 (Duplicate) 19-Feb-24	Nitrate plus nitrite	4.66	0.170	0.500	10.0			121811-001	EPA 353.2
TA2-W-01 22-Feb-24	Nitrate plus nitrite	3.92	0.0850	0.250	10.0			121816-001	EPA 353.2
TA2-W-19 29-Feb-24	Nitrate plus nitrite	**12.3**	0.425	1.25	10.0			121821-001	EPA 353.2
TA2-W-26 27-Feb-24	Nitrate plus nitrite	5.13	0.425	1.25	10.0			121817-001	EPA 353.2
TA2-W-27 21-Feb-24	Nitrate plus nitrite	3.99	0.0850	0.250	10.0			121815-001	EPA 353.2
TA2-W-28 06-Mar-24	Nitrate plus nitrite	**17.4**	0.850	2.50	10.0			121823-001	EPA 353.2
TJA-2 04-Mar-24	Nitrate plus nitrite	**11.7**	0.850	2.50	10.0			121824-001	EPA 353.2
TJA-5 05-Mar-24	Nitrate plus nitrite	**12.6**	0.850	2.50	10.0			121825-001	EPA 353.2
TJA-7 07-Mar-24	Nitrate plus nitrite	**20.7**	0.850	2.50	10.0			121827-001	EPA 353.2
TJA-7 (Duplicate) 07-Mar-24	Nitrate plus nitrite	**20.6**	0.850	2.50	10.0			121828-001	EPA 353.2

See notes at end of tables.

Table 6C-1 (continued)
Summary of Nitrate plus Nitrite Results for Environmental Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result [a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL[d] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method [g]
TA1-W-02 22-Aug-24	Nitrate plus nitrite	1.23	0.0170	0.0500	10.0			122929-002	EPA 353.2
TA1-W-06 05-Sep-24	Nitrate plus nitrite	3.45	0.170	0.500	10.0			122965-002	EPA 353.2
TA1-W-08 11-Sep-24	Nitrate plus nitrite	8.72	0.170	0.500	10.0			122967-002	EPA 353.2
TA2-NW1-325 09-Sep-24	Nitrate plus nitrite	4.20	0.170	0.500	10.0			122961-002	EPA 353.2
TA2-NW1-595 27-Aug-24	Nitrate plus nitrite	3.79	0.170	0.500	10.0			122943-002	EPA 353.2
TA2-NW1-595 (Duplicate) 27-Aug-24	Nitrate plus nitrite	3.72	0.0850	0.250	10.0			122944-001	EPA 353.2
TA2-W-01 03-Sep-24	Nitrate plus nitrite	3.96	0.170	0.500	10.0			122955-002	EPA 353.2
TA2-W-01 (Duplicate) 03-Sep-24	Nitrate plus nitrite	4.15	0.170	0.500	10.0			122956-001	EPA 353.2
TA2-W-19 12-Sep-24	Nitrate plus nitrite	**13.5**	0.170	0.500	10.0			122971-002	EPA 353.2
TA2-W-24 21-Aug-24	Nitrate plus nitrite	2.23	0.0850	0.250	10.0			129926-002	EPA 353.2
TA2-W-24 (Duplicate) 21-Aug-24	Nitrate plus nitrite	2.31	0.0850	0.250	10.0			129927-001	EPA 353.2
TA2-W-25 26-Aug-24	Nitrate plus nitrite	3.34	0.0850	0.250	10.0			122939-002	EPA 353.2
TA2-W-26 19-Sep-24	Nitrate plus nitrite	5.05	0.850	2.50	10.0			122987-002	EPA 353.2
TA2-W-27 04-Sep-24	Nitrate plus nitrite	4.05	0.170	0.500	10.0			122959-002	EPA 353.2
TA2-W-28 16-Sep-24	Nitrate plus nitrite	**17.3**	0.340	1.00	10.0			122977-002	EPA 353.2
TJA-2 10-Sep-24	Nitrate plus nitrite	**13.0**	0.850	2.50	10.0			122969-002	EPA 353.2
TJA-3 28-Aug-24	Nitrate plus nitrite	2.39	0.0850	0.250	10.0			122946-002	EPA 353.2

See notes at end of tables.

Table 6C-1 (concluded)
Summary of Nitrate plus Nitrite Results for Environmental Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result [a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL[d] (mg/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
TJA-4 17-Sep-24	Nitrate plus nitrite	**32.1**	1.70	5.00	10.0			122982-002	EPA 353.2
TJA-4 (Duplicate) 17-Sep-24	Nitrate plus nitrite	**32.5**	1.70	5.00	10.0			122983-001	EPA 353.2
TJA-5 13-Sep-24	Nitrate plus nitrite	**14.2**	0.170	0.500	10.0			122974-002	EPA 353.2
TJA-6 23-Aug-24	Nitrate plus nitrite	2.74	0.0850	0.250	10.0			122936-002	EPA 353.2
TJA-7 18-Sep-24	Nitrate plus nitrite	**21.9**	0.850	2.50	10.0			122985-002	EPA 353.2
WYO-3 20-Sep-24	Nitrate plus nitrite	3.03	0.0850	0.250	10.0		J	122933-002	EPA 353.2
WYO-3 (Duplicate) 20-Sep-24	Nitrate plus nitrite	2.77	0.0850	0.250	10.0		J	122934-001	EPA 353.2

See notes at end of tables.

Table 6C-2
Summary of Detected Volatile Organic Compounds for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result [a] (µg/L)	MDL[b] (µg/L)	PQL[c] (µg/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
TA1-W-06	1,1-Dichloroethene	1.34	0.333	1.00			122965-001	SW846-8260D
05-Sep-24	Trichloroethene	0.480	0.333	1.00	J		122965-001	SW846-8260D
TA2-NW1-325	Chloroform	0.340	0.333	1.00	J		122961-001	SW846-8260D
09-Sep-24	Tetrachloroethene	0.580	0.333	1.00	J		122961-001	SW846-8260D
	Trichloroethene	0.940	0.333	1.00	J		122961-001	SW846-8260D
TA2-W-01 03-Sep-24	Trichloroethene	1.12	0.333	1.00			122955-001	SW846-8260D
TA2-W-19 12-Sep-24	Trichloroethene	2.21	0.333	1.00			122971-001	SW846-8260D
TA2-W-26	1,1-Dichloroethane	4.12	0.333	1.00			123497-001	SW846-8260D
06-Nov-24	1,1-Dichloroethene	1.97	0.333	1.00			123497-001	SW846-8260D
	Chloroform	0.490	0.333	1.00	J	J	123497-001	SW846-8260D
	Methylene chloride	0.660	0.500	5.00	B, J	5.00UJ	123497-001	SW846-8260D
	Tetrachloroethene	**11.6**	0.333	1.00			123497-001	SW846-8260D
	Trichloroethene	**18.5**	0.333	1.00			123497-001	SW846-8260D
	cis 1,2-Dichloroethene	5.36	0.333	1.00			123497-001	SW846-8260D
TA2-W-27	Tetrachloroethene	1.36	0.333	1.00			122959-001	SW846-8260D
04-Sep-24	Trichloroethene	1.00	0.333	1.00			122959-001	SW846-8260D
TJA-2	Methylene chloride	0.550	0.500	5.00	J	5.00UJ	122969-001	SW846-8260D
10-Sep-24	Trichloroethene	3.87	0.333	1.00			122969-001	SW846-8260D
TJA-3	Methylene chloride	1.33	0.500	5.00	J	5.00UJ	122946-001	SW846-8260D
28-Aug-24	Trichloroethene	0.650	0.333	1.00	J		122946-001	SW846-8260D
TJA-7 18-Sep-24	Trichloroethene	**5.29**	0.333	1.00			122985-001	SW846-8260D
WYO-3	Acetone	3.04	1.74	5.00	J	5.00UJ	123493-001	SW846-8260D
05-Nov-24	Methylene chloride	1.54	0.500	5.00	B, J	5.00UJ	123493-001	SW846-8260D

See notes at end of tables.

Table 6C-3
Method Detection Limits for Volatile Organic Compounds (EPA Method[g] SW846-8260D), Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Analyte	MDL[b] (µg/L)	Analyte	MDL[b] (µg/L)
1,1,1-Trichloroethane	0.333	Chlorobenzene	0.333
1,1,2,2-Tetrachloroethane	0.333	Chloroethane	0.333
1,1,2-Trichloroethane	0.333	Chloroform	0.333
1,1-Dichloroethane	0.333	Chloromethane	0.333
1,1-Dichloroethene	0.333	Cyclohexane	0.333
1,2,3-Trichlorobenzene	0.333	Dibromochloromethane	0.333
1,2,4-Trichlorobenzene	0.333	Dichlorodifluoromethane	0.355
1,2-Dibromo-3-chloropropane	0.333	Ethylbenzene	0.333
1,2-Dibromoethane	0.333	Isopropylbenzene	0.333
1,2-Dichlorobenzene	0.333	Methyl acetate	1.67
1,2-Dichloroethane	0.333	Methylcyclohexane	0.333
1,2-Dichloropropane	0.333	Methylene chloride	0.500
1,3-Dichlorobenzene	0.333	Styrene	0.333
1,4-Dichlorobenzene	0.333	Tert-butyl methyl ether	0.333
2,2-trifluoroethane, 1,1,2-Trichloro-1	1.67	Tetrachloroethene	0.333
2-Butanone	1.67	Toluene	0.333
2-Hexanone	1.67	Trichloroethene	0.333
4-methyl-, 2-Pentanone	1.67	Trichlorofluoromethane	0.333
Acetone	1.74	Vinyl chloride	0.333
Benzene	0.333	Xylene	1.00
Bromochloromethane	0.333	cis-1,2-Dichloroethene	0.333
Bromodichloromethane	0.333	cis-1,3-Dichloropropene	0.333
Bromoform	0.333	m-, p-Xylene	0.500
Bromomethane	0.337	o-Xylene	0.333
Carbon disulfide	1.67	trans-1,2-Dichloroethene	0.333
Carbon tetrachloride	0.333	trans-1,3-Dichloropropene	0.333

See notes at end of tables.

Table 6C-4
Summary of Major Anion and Alkalinity Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result [a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
TA1-W-02	Bromide	0.222	0.0670	0.200			122929-003	SW846-9056A
22-Aug-24	Chloride	15.6	0.335	1.00	B		122929-003	SW846-9056A
	Fluoride	0.457	0.0330	0.100			122929-003	SW846-9056A
	Sulfate	77.8	0.665	2.00			122929-003	SW846-9056A
	Bicarbonate Alkalinity	171	0.725	2.00			122929-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122929-004	SM 2320B
TA1-W-06	Bromide	1.50	0.0670	0.200			122965-003	SW846-9056A
05-Sep-24	Chloride	116	1.34	4.00			122965-003	SW846-9056A
	Fluoride	0.360	0.0330	0.100			122965-003	SW846-9056A
	Sulfate	213	2.66	8.00			122965-003	SW846-9056A
	Bicarbonate Alkalinity	88.3	0.725	2.00			122965-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122965-004	SM 2320B
TA1-W-08	Bromide	4.30	0.0670	0.200			122967-003	SW846-9056A
11-Sep-24	Chloride	221	6.70	20.0		J	122967-003	SW846-9056A
	Fluoride	0.262	0.0330	0.100			122967-003	SW846-9056A
	Sulfate	654	13.3	40.0		J	122967-003	SW846-9056A
	Bicarbonate Alkalinity	80.8	0.725	2.00			122967-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122967-004	SM 2320B
TA2-NW1-325	Bromide	1.49	0.0670	0.200			122961-003	SW846-9056A
09-Sep-24	Chloride	117	1.34	4.00			122961-003	SW846-9056A
	Fluoride	0.387	0.0330	0.100			122961-003	SW846-9056A
	Sulfate	82.3	2.66	8.00			122961-003	SW846-9056A
	Bicarbonate Alkalinity	94.5	0.725	2.00			122961-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122961-004	SM 2320B
TA2-NW1-595	Bromide	0.871	0.0670	0.200			122943-003	SW846-9056A
27-Aug-24	Chloride	66.1	0.670	2.00			122943-003	SW846-9056A
	Fluoride	0.307	0.0330	0.100			122943-003	SW846-9056A
	Sulfate	83.7	1.33	4.00			122943-003	SW846-9056A
	Bicarbonate Alkalinity	141	0.725	2.00			122943-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122943-004	SM 2320B
TA2-W-01	Bromide	1.47	0.0670	0.200			122955-003	SW846-9056A
03-Sep-24	Chloride	101	1.34	4.00			122955-003	SW846-9056A
	Fluoride	0.393	0.0330	0.100			122955-003	SW846-9056A
	Sulfate	67.9	2.66	8.00			122955-003	SW846-9056A
	Bicarbonate Alkalinity	99.7	0.725	2.00			122955-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122955-004	SM 2320B

See notes at end of tables.

Table 6C-4 (continued)
Summary of Major Anion and Alkalinity Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result [a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
TA2-W-19 12-Sep-24	Bromide	0.914	0.0670	0.200			122971-003	SW846-9056A
	Chloride	51.8	0.670	2.00			122971-003	SW846-9056A
	Fluoride	0.381	0.0330	0.100			122971-003	SW846-9056A
	Sulfate	52.6	1.33	4.00			122971-003	SW846-9056A
	Bicarbonate Alkalinity	112	0.725	2.00			122971-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122971-004	SM 2320B
TA2-W-24 21-Aug-24	Bromide	0.194	0.0670	0.200	J		129926-003	SW846-9056A
	Chloride	13.2	0.335	1.00	B		129926-003	SW846-9056A
	Fluoride	0.483	0.0330	0.100			129926-003	SW846-9056A
	Sulfate	45.7	0.665	2.00			129926-003	SW846-9056A
	Bicarbonate Alkalinity	167	0.725	2.00			129926-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		129926-004	SM 2320B
TA2-W-25 26-Aug-24	Bromide	0.249	0.0670	0.200			122939-003	SW846-9056A
	Chloride	16.3	0.335	1.00			122939-003	SW846-9056A
	Fluoride	0.315	0.0330	0.100			122939-003	SW846-9056A
	Sulfate	70.1	0.665	2.00			122939-003	SW846-9056A
	Bicarbonate Alkalinity	169	0.725	2.00			122939-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122939-004	SM 2320B
TA2-W-26 19-Sep-24	Bromide	0.973	0.0670	0.200			122987-003	SW846-9056A
	Chloride	61.7	0.670	2.00			122987-003	SW846-9056A
	Fluoride	0.296	0.0330	0.100			122987-003	SW846-9056A
	Sulfate	144	1.33	4.00			122987-003	SW846-9056A
	Bicarbonate Alkalinity	144	0.725	2.00			122987-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122987-004	SM 2320B
TA2-W-27 04-Sep-24	Bromide	1.60	0.0670	0.200			122959-003	SW846-9056A
	Chloride	112	1.34	4.00			122959-003	SW846-9056A
	Fluoride	0.363	0.0330	0.100			122959-003	SW846-9056A
	Sulfate	154	2.66	8.00			122959-003	SW846-9056A
	Bicarbonate Alkalinity	105	0.725	2.00			122959-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122959-004	SM 2320B
TA2-W-28 16-Sep-24	Bromide	0.830	0.0670	0.200			122977-003	SW846-9056A
	Chloride	45.5	0.670	2.00			122977-003	SW846-9056A
	Fluoride	0.420	0.0330	0.100			122977-003	SW846-9056A
	Sulfate	16.8	0.133	0.400		J	122977-003	SW846-9056A
	Bicarbonate Alkalinity	115	0.725	2.00			122977-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122977-004	SM 2320B

See notes at end of tables.

Table 6C-4 (continued)
Summary of Major Anion and Alkalinity Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result [a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
TJA-2	Bromide	1.06	0.0670	0.200			122969-003	SW846-9056A
10-Sep-24	Chloride	56.6	0.670	2.00			122969-003	SW846-9056A
	Fluoride	0.359	0.0330	0.100			122969-003	SW846-9056A
	Sulfate	49.2	1.33	4.00			122969-003	SW846-9056A
	Bicarbonate Alkalinity	119	0.725	2.00			122969-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122969-004	SM 2320B
TJA-3	Bromide	0.189	0.0670	0.200	J		122946-003	SW846-9056A
28-Aug-24	Chloride	12.9	0.335	1.00			122946-003	SW846-9056A
	Fluoride	0.322	0.0330	0.100			122946-003	SW846-9056A
	Sulfate	80.5	0.665	2.00			122946-003	SW846-9056A
	Bicarbonate Alkalinity	174	0.725	2.00			122946-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122946-004	SM 2320B
TJA-4	Bromide	0.415	0.0670	0.200			122982-003	SW846-9056A
17-Sep-24	Chloride	21.4	0.335	1.00			122982-003	SW846-9056A
	Fluoride	0.394	0.0330	0.100			122982-003	SW846-9056A
	Sulfate	16.9	0.133	0.400		J	122982-003	SW846-9056A
	Bicarbonate Alkalinity	135	0.725	2.00			122982-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122982-004	SM 2320B
TJA-5	Bromide	0.259	0.0670	0.200			122974-003	SW846-9056A
13-Sep-24	Chloride	15.7	0.670	2.00			122974-003	SW846-9056A
	Fluoride	0.368	0.0330	0.100			122974-003	SW846-9056A
	Sulfate	107	1.33	4.00			122974-003	SW846-9056A
	Bicarbonate Alkalinity	128	0.725	2.00			122974-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122974-004	SM 2320B
TJA-6	Bromide	0.194	0.0670	0.200	J		122936-003	SW846-9056A
23-Aug-24	Chloride	13.5	0.335	1.00	B		122936-003	SW846-9056A
	Fluoride	0.435	0.0330	0.100			122936-003	SW846-9056A
	Sulfate	58.7	0.665	2.00			122936-003	SW846-9056A
	Bicarbonate Alkalinity	162	0.725	2.00			122936-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122936-004	SM 2320B
TJA-7	Bromide	0.490	0.0670	0.200			122985-003	SW846-9056A
18-Sep-24	Chloride	23.6	0.335	1.00			122985-003	SW846-9056A
	Fluoride	0.392	0.0330	0.100			122985-003	SW846-9056A
	Sulfate	23.7	0.665	2.00			122985-003	SW846-9056A
	Bicarbonate Alkalinity	130	0.725	2.00			122985-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122985-004	SM 2320B

See notes at end of tables.

Table 6C-4 (concluded)
Summary of Major Anion and Alkalinity Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result [a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
WYO-3	Bromide	0.188	0.0670	0.200	J		122933-003	SW846-9056A
20-Sep-24	Chloride	13.2	0.670	2.00			122933-003	SW846-9056A
	Fluoride	0.470	0.0330	0.100			122933-003	SW846-9056A
	Sulfate	74.7	1.33	4.00			122933-003	SW846-9056A
	Bicarbonate Alkalinity	173	0.725	2.00			122933-004	SM 2320B
	Carbonate Alkalinity	ND	0.725	2.00	U		122933-004	SM 2320B

See notes at end of tables.

Table 6C-5
Summary of TAL Metals and Total Uranium Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result [a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
TA1-W-02	Aluminum	0.0199	0.0193	0.0500	J		122929-005	SW846-6020B
22-Aug-24	Antimony	ND	0.00100	0.00300	U		122929-005	SW846-6020B
	Arsenic	ND	0.00200	0.00500	U		122929-005	SW846-6020B
	Barium	0.0488	0.000670	0.00400			122929-005	SW846-6020B
	Beryllium	ND	0.000200	0.000500	U		122929-005	SW846-6020B
	Cadmium	ND	0.000300	0.00100	U		122929-005	SW846-6020B
	Calcium	70.6	0.800	2.00			122929-005	SW846-6020B
	Chromium	ND	0.00300	0.0100	U		122929-005	SW846-6020B
	Cobalt	ND	0.000300	0.00100	U		122929-005	SW846-6020B
	Copper	ND	0.000300	0.00200	U		122929-005	SW846-6020B
	Iron	0.0424	0.0330	0.100	J		122929-005	SW846-6020B
	Lead	ND	0.000500	0.00200	U		122929-005	SW846-6020B
	Magnesium	13.1	0.0100	0.0300			122929-005	SW846-6020B
	Manganese	ND	0.00100	0.00500	U		122929-005	SW846-6020B
	Mercury	ND	0.0000670	0.000200	U		122929-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122929-005	SW846-6020B
	Potassium	2.17	0.0800	0.300			122929-005	SW846-6020B
	Selenium	ND	0.00150	0.00500	U		122929-005	SW846-6020B
	Silver	ND	0.000300	0.00100	U		122929-005	SW846-6020B
	Sodium	23.1	0.0800	0.250			122929-005	SW846-6020B
	Thallium	ND	0.000600	0.00200	U		122929-005	SW846-6020B
	Uranium	0.00308	0.0000670	0.000200			122929-005	SW846-6020B
	Vanadium	0.00603	0.00330	0.0200	J		122929-005	SW846-6020B
	Zinc	ND	0.00330	0.0200	U		122929-005	SW846-6020B

See notes at end of tables.

Table 6C-5 (continued)
Summary of TAL Metals and Total Uranium Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result [a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
TA1-W-06	Aluminum	ND	0.0193	0.0500	U		122965-005	SW846-6020B
05-Sep-24	Antimony	ND	0.00100	0.00300	U		122965-005	SW846-6020B
	Arsenic	0.00227	0.00200	0.00500	J		122965-005	SW846-6020B
	Barium	0.0244	0.000670	0.00400			122965-005	SW846-6020B
	Beryllium	ND	0.000200	0.000500	U		122965-005	SW846-6020B
	Cadmium	ND	0.000300	0.00100	U	R	122965-005	SW846-6020B
	Calcium	132	0.800	2.00			122965-005	SW846-6020B
	Chromium	ND	0.00300	0.0100	U		122965-005	SW846-6020B
	Cobalt	ND	0.000300	0.00100	U		122965-005	SW846-6020B
	Copper	ND	0.000300	0.00200	U		122965-005	SW846-6020B
	Iron	ND	0.0330	0.100	U		122965-005	SW846-6020B
	Lead	ND	0.000500	0.00200	U		122965-005	SW846-6020B
	Magnesium	16.7	0.0100	0.0300			122965-005	SW846-6020B
	Manganese	ND	0.00100	0.00500	U	R	122965-005	SW846-6020B
	Mercury	ND	0.0000670	0.000200	U		122965-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122965-005	SW846-6020B
	Potassium	2.24	0.0800	0.300			122965-005	SW846-6020B
	Selenium	0.00835	0.00150	0.00500			122965-005	SW846-6020B
	Silver	ND	0.000300	0.00100	U		122965-005	SW846-6020B
	Sodium	31.9	0.0800	0.250			122965-005	SW846-6020B
	Thallium	ND	0.000600	0.00200	U		122965-005	SW846-6020B
	Uranium	0.00104	0.0000670	0.000200			122965-005	SW846-6020B
	Vanadium	0.00414	0.00330	0.0200	J		122965-005	SW846-6020B
	Zinc	ND	0.00330	0.0200	U		122965-005	SW846-6020B

See notes at end of tables.

Table 6C-5 (continued)
Summary of TAL Metals and Total Uranium Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result [a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
TA1-W-08	Aluminum	ND	0.0193	0.0500	U		122967-005	SW846-6020B
11-Sep-24	Antimony	ND	0.00100	0.00300	U		122967-005	SW846-6020B
	Arsenic	0.00315	0.00200	0.00500	J		122967-005	SW846-6020B
	Barium	0.0178	0.000670	0.00400			122967-005	SW846-6020B
	Beryllium	ND	0.000200	0.000500	U		122967-005	SW846-6020B
	Cadmium	ND	0.000300	0.00100	U		122967-005	SW846-6020B
	Calcium	329	0.800	2.00			122967-005	SW846-6020B
	Chromium	ND	0.00300	0.0100	U		122967-005	SW846-6020B
	Cobalt	ND	0.000300	0.00100	U		122967-005	SW846-6020B
	Copper	ND	0.000300	0.00200	U		122967-005	SW846-6020B
	Iron	0.103	0.0330	0.100			122967-005	SW846-6020B
	Lead	ND	0.000500	0.00200	U		122967-005	SW846-6020B
	Magnesium	41.2	0.0100	0.0300			122967-005	SW846-6020B
	Manganese	ND	0.00100	0.00500	U		122967-005	SW846-6020B
	Mercury	ND	0.0000670	0.000200	U		122967-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122967-005	SW846-6020B
	Potassium	3.09	0.0800	0.300			122967-005	SW846-6020B
	Selenium	0.0318	0.00150	0.00500			122967-005	SW846-6020B
	Silver	ND	0.000300	0.00100	U		122967-005	SW846-6020B
	Sodium	79.7	0.800	2.50			122967-005	SW846-6020B
	Thallium	ND	0.000600	0.00200	U		122967-005	SW846-6020B
	Uranium	0.00147	0.0000670	0.000200			122967-005	SW846-6020B
	Vanadium	0.00379	0.00330	0.0200	J	J-	122967-005	SW846-6020B
	Zinc	ND	0.00330	0.0200	U		122967-005	SW846-6020B

See notes at end of tables.

Table 6C-5 (continued)
Summary of TAL Metals and Total Uranium Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result [a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
TA2-NW1-325	Aluminum	ND	0.0193	0.0500	U		122961-005	SW846-6020B
09-Sep-24	Antimony	ND	0.00100	0.00300	U		122961-005	SW846-6020B
	Arsenic	ND	0.00200	0.00500	U		122961-005	SW846-6020B
	Barium	0.0543	0.000670	0.00400			122961-005	SW846-6020B
	Beryllium	ND	0.000200	0.000500	U		122961-005	SW846-6020B
	Cadmium	ND	0.000300	0.00100	U		122961-005	SW846-6020B
	Calcium	98.5	0.800	2.00			122961-005	SW846-6020B
	Chromium	ND	0.00300	0.0100	U		122961-005	SW846-6020B
	Cobalt	ND	0.000300	0.00100	U		122961-005	SW846-6020B
	Copper	0.000301	0.000300	0.00200	J		122961-005	SW846-6020B
	Iron	0.0425	0.0330	0.100	J		122961-005	SW846-6020B
	Lead	ND	0.000500	0.00200	U		122961-005	SW846-6020B
	Magnesium	13.5	0.0100	0.0300			122961-005	SW846-6020B
	Manganese	ND	0.00100	0.00500	U		122961-005	SW846-6020B
	Mercury	ND	0.0000670	0.000200	U		122961-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122961-005	SW846-6020B
	Potassium	1.87	0.0800	0.300			122961-005	SW846-6020B
	Selenium	0.00505	0.00150	0.00500			122961-005	SW846-6020B
	Silver	ND	0.000300	0.00100	U		122961-005	SW846-6020B
	Sodium	23.3	0.0800	0.250			122961-005	SW846-6020B
	Thallium	ND	0.000600	0.00200	U		122961-005	SW846-6020B
	Uranium	0.00103	0.0000670	0.000200			122961-005	SW846-6020B
	Vanadium	0.00366	0.00330	0.0200	J	J-	122961-005	SW846-6020B
	Zinc	ND	0.00330	0.0200	U		122961-005	SW846-6020B

See notes at end of tables.

Table 6C-5 (continued)
Summary of TAL Metals and Total Uranium Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result [a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
TA2-NW1-595	Aluminum	0.0219	0.0193	0.0500	J		122943-005	SW846-6020B
27-Aug-24	Antimony	ND	0.00100	0.00300	U		122943-005	SW846-6020B
	Arsenic	ND	0.00200	0.00500	U		122943-005	SW846-6020B
	Barium	0.0389	0.000670	0.00400			122943-005	SW846-6020B
	Beryllium	ND	0.000200	0.000500	U		122943-005	SW846-6020B
	Cadmium	ND	0.000300	0.00100	U		122943-005	SW846-6020B
	Calcium	89.9	0.800	2.00			122943-005	SW846-6020B
	Chromium	ND	0.00300	0.0100	U		122943-005	SW846-6020B
	Cobalt	ND	0.000300	0.00100	U		122943-005	SW846-6020B
	Copper	ND	0.000300	0.00200	U		122943-005	SW846-6020B
	Iron	ND	0.0330	0.100	U		122943-005	SW846-6020B
	Lead	ND	0.000500	0.00200	U		122943-005	SW846-6020B
	Magnesium	14.1	0.0100	0.0300			122943-005	SW846-6020B
	Manganese	ND	0.00100	0.00500	U		122943-005	SW846-6020B
	Mercury	ND	0.0000670	0.000200	U		122943-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122943-005	SW846-6020B
	Potassium	2.29	0.0800	0.300			122943-005	SW846-6020B
	Selenium	0.00539	0.00150	0.00500			122943-005	SW846-6020B
	Silver	ND	0.000300	0.00100	U		122943-005	SW846-6020B
	Sodium	27.1	0.0800	0.250			122943-005	SW846-6020B
	Thallium	ND	0.000600	0.00200	U		122943-005	SW846-6020B
	Uranium	0.00211	0.0000670	0.000200			122943-005	SW846-6020B
	Vanadium	0.00388	0.00330	0.0200	J		122943-005	SW846-6020B
	Zinc	ND	0.00330	0.0200	U		122943-005	SW846-6020B

See notes at end of tables.

Table 6C-5 (continued)
Summary of TAL Metals and Total Uranium Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result [a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
TA2-W-01	Aluminum	ND	0.0193	0.0500	U		122955-005	SW846-6020B
03-Sep-24	Antimony	ND	0.00100	0.00300	U		122955-005	SW846-6020B
	Arsenic	0.00224	0.00200	0.00500	J		122955-005	SW846-6020B
	Barium	0.0597	0.000670	0.00400			122955-005	SW846-6020B
	Beryllium	ND	0.000200	0.000500	U		122955-005	SW846-6020B
	Cadmium	ND	0.000300	0.00100	U		122955-005	SW846-6020B
	Calcium	88.9	0.800	2.00			122955-005	SW846-6020B
	Chromium	ND	0.00300	0.0100	U		122955-005	SW846-6020B
	Cobalt	ND	0.000300	0.00100	U		122955-005	SW846-6020B
	Copper	ND	0.000300	0.00200	U		122955-005	SW846-6020B
	Iron	ND	0.0330	0.100	U		122955-005	SW846-6020B
	Lead	ND	0.000500	0.00200	U		122955-005	SW846-6020B
	Magnesium	12.7	0.0100	0.0300			122955-005	SW846-6020B
	Manganese	ND	0.00100	0.00500	U		122955-005	SW846-6020B
	Mercury	ND	0.0000670	0.000200	U		122955-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122955-005	SW846-6020B
	Potassium	1.97	0.0800	0.300			122955-005	SW846-6020B
	Selenium	0.00656	0.00150	0.00500			122955-005	SW846-6020B
	Silver	ND	0.000300	0.00100	U		122955-005	SW846-6020B
	Sodium	21.8	0.0800	0.250			122955-005	SW846-6020B
	Thallium	ND	0.000600	0.00200	U		122955-005	SW846-6020B
	Uranium	0.00103	0.0000670	0.000200			122955-005	SW846-6020B
	Vanadium	0.00450	0.00330	0.0200	J		122955-005	SW846-6020B
	Zinc	ND	0.00330	0.0200	U		122955-005	SW846-6020B

See notes at end of tables.

Table 6C-5 (continued)
Summary of TAL Metals and Total Uranium Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result [a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
TA2-W-19	Aluminum	ND	0.0193	0.0500	U		122971-005	SW846-6020B
12-Sep-24	Antimony	ND	0.00100	0.00300	U		122971-005	SW846-6020B
	Arsenic	ND	0.00200	0.00500	U		122971-005	SW846-6020B
	Barium	0.0506	0.000670	0.00400			122971-005	SW846-6020B
	Beryllium	ND	0.000200	0.000500	U		122971-005	SW846-6020B
	Cadmium	ND	0.000300	0.00100	U		122971-005	SW846-6020B
	Calcium	74.6	0.400	1.00			122971-005	SW846-6020B
	Chromium	ND	0.00300	0.0100	U		122971-005	SW846-6020B
	Cobalt	ND	0.000300	0.00100	U		122971-005	SW846-6020B
	Copper	ND	0.000300	0.00200	U		122971-005	SW846-6020B
	Iron	ND	0.0330	0.100	U		122971-005	SW846-6020B
	Lead	ND	0.000500	0.00200	U		122971-005	SW846-6020B
	Magnesium	12.4	0.0100	0.0300			122971-005	SW846-6020B
	Manganese	ND	0.00100	0.00500	U		122971-005	SW846-6020B
	Mercury	ND	0.0000670	0.000200	U		122971-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122971-005	SW846-6020B
	Potassium	1.84	0.0800	0.300			122971-005	SW846-6020B
	Selenium	0.00425	0.00150	0.00500	J		122971-005	SW846-6020B
	Silver	ND	0.000300	0.00100	U		122971-005	SW846-6020B
	Sodium	23.5	0.0800	0.250			122971-005	SW846-6020B
	Thallium	ND	0.000600	0.00200	U		122971-005	SW846-6020B
	Uranium	0.00121	0.0000670	0.000200			122971-005	SW846-6020B
	Vanadium	0.00498	0.00330	0.0200	J	J-	122971-005	SW846-6020B
	Zinc	ND	0.00330	0.0200	U		122971-005	SW846-6020B

See notes at end of tables.

Table 6C-5 (continued)
Summary of TAL Metals and Total Uranium Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result [a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
TA2-W-24	Aluminum	ND	0.0193	0.0500	U		129926-005	SW846-6020B
21-Aug-24	Antimony	ND	0.00100	0.00300	U		129926-005	SW846-6020B
	Arsenic	ND	0.00200	0.00500	U		129926-005	SW846-6020B
	Barium	0.0931	0.000670	0.00400			129926-005	SW846-6020B
	Beryllium	ND	0.000200	0.000500	U		129926-005	SW846-6020B
	Cadmium	ND	0.000300	0.00100	U		129926-005	SW846-6020B
	Calcium	58.3	0.800	2.00			129926-005	SW846-6020B
	Chromium	ND	0.00300	0.0100	U		129926-005	SW846-6020B
	Cobalt	ND	0.000300	0.00100	U		129926-005	SW846-6020B
	Copper	ND	0.000300	0.00200	U		129926-005	SW846-6020B
	Iron	ND	0.0330	0.100	U		129926-005	SW846-6020B
	Lead	ND	0.000500	0.00200	U		129926-005	SW846-6020B
	Magnesium	10.7	0.0100	0.0300			129926-005	SW846-6020B
	Manganese	0.00189	0.00100	0.00500	J		129926-005	SW846-6020B
	Mercury	ND	0.0000670	0.000200	U		129926-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		129926-005	SW846-6020B
	Potassium	3.24	0.0800	0.300			129926-005	SW846-6020B
	Selenium	ND	0.00150	0.00500	U		129926-005	SW846-6020B
	Silver	ND	0.000300	0.00100	U		129926-005	SW846-6020B
	Sodium	22.2	0.0800	0.250			129926-005	SW846-6020B
	Thallium	ND	0.000600	0.00200	U		129926-005	SW846-6020B
	Uranium	0.00269	0.0000670	0.000200			129926-005	SW846-6020B
	Vanadium	0.00577	0.00330	0.0200	J		129926-005	SW846-6020B
	Zinc	ND	0.00330	0.0200	U		129926-005	SW846-6020B

See notes at end of tables.

Table 6C-5 (continued)
Summary of TAL Metals and Total Uranium Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result [a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
TA2-W-25	Aluminum	ND	0.0193	0.0500	U		122939-005	SW846-6020B
26-Aug-24	Antimony	ND	0.00100	0.00300	U		122939-005	SW846-6020B
	Arsenic	ND	0.00200	0.00500	U		122939-005	SW846-6020B
	Barium	0.0401	0.000670	0.00400			122939-005	SW846-6020B
	Beryllium	ND	0.000200	0.000500	U		122939-005	SW846-6020B
	Cadmium	ND	0.000300	0.00100	U		122939-005	SW846-6020B
	Calcium	70.3	0.800	2.00			122939-005	SW846-6020B
	Chromium	ND	0.00300	0.0100	U		122939-005	SW846-6020B
	Cobalt	ND	0.000300	0.00100	U		122939-005	SW846-6020B
	Copper	ND	0.000300	0.00200	U		122939-005	SW846-6020B
	Iron	ND	0.0330	0.100	U		122939-005	SW846-6020B
	Lead	ND	0.000500	0.00200	U		122939-005	SW846-6020B
	Magnesium	10.6	0.0100	0.0300			122939-005	SW846-6020B
	Manganese	ND	0.00100	0.00500	U		122939-005	SW846-6020B
	Mercury	ND	0.0000670	0.000200	U		122939-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122939-005	SW846-6020B
	Potassium	1.76	0.0800	0.300			122939-005	SW846-6020B
	Selenium	0.00205	0.00150	0.00500	J		122939-005	SW846-6020B
	Silver	ND	0.000300	0.00100	U		122939-005	SW846-6020B
	Sodium	25.9	0.0800	0.250			122939-005	SW846-6020B
	Thallium	ND	0.000600	0.00200	U		122939-005	SW846-6020B
	Uranium	0.00235	0.0000670	0.000200			122939-005	SW846-6020B
	Vanadium	0.00454	0.00330	0.0200	J		122939-005	SW846-6020B
	Zinc	ND	0.00330	0.0200	U		122939-005	SW846-6020B

See notes at end of tables.

Table 6C-5 (continued)
Summary of TAL Metals and Total Uranium Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result [a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
TA2-W-26	Aluminum	0.343	0.0193	0.0500			122987-005	SW846-6020B
19-Sep-24	Antimony	ND	0.00100	0.00300	U		122987-005	SW846-6020B
	Arsenic	ND	0.00200	0.00500	U		122987-005	SW846-6020B
	Barium	0.0596	0.000670	0.00400			122987-005	SW846-6020B
	Beryllium	ND	0.000200	0.000500	U		122987-005	SW846-6020B
	Cadmium	ND	0.000300	0.00100	U		122987-005	SW846-6020B
	Calcium	112	0.800	2.00			122987-005	SW846-6020B
	Chromium	ND	0.00300	0.0100	U		122987-005	SW846-6020B
	Cobalt	ND	0.000300	0.00100	U		122987-005	SW846-6020B
	Copper	0.000393	0.000300	0.00200	J		122987-005	SW846-6020B
	Iron	0.247	0.0330	0.100			122987-005	SW846-6020B
	Lead	ND	0.000500	0.00200	U		122987-005	SW846-6020B
	Magnesium	16.2	0.0100	0.0300			122987-005	SW846-6020B
	Manganese	0.00412	0.00100	0.00500	J	J+	122987-005	SW846-6020B
	Mercury	ND	0.0000670	0.000200	U		122987-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122987-005	SW846-6020B
	Potassium	2.09	0.0800	0.300			122987-005	SW846-6020B
	Selenium	0.00776	0.00150	0.00500			122987-005	SW846-6020B
	Silver	ND	0.000300	0.00100	U		122987-005	SW846-6020B
	Sodium	30.2	0.0800	0.250			122987-005	SW846-6020B
	Thallium	ND	0.000600	0.00200	U		122987-005	SW846-6020B
	Uranium	0.00201	0.0000670	0.000200			122987-005	SW846-6020B
	Vanadium	0.00561	0.00330	0.0200	J		122987-005	SW846-6020B
	Zinc	ND	0.00330	0.0200	U		122987-005	SW846-6020B

See notes at end of tables.

Table 6C-5 (continued)
Summary of TAL Metals and Total Uranium Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result [a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
TA2-W-27	Aluminum	ND	0.0193	0.0500	U		122959-005	SW846-6020B
04-Sep-24	Antimony	ND	0.00100	0.00300	U		122959-005	SW846-6020B
	Arsenic	0.00217	0.00200	0.00500	J		122959-005	SW846-6020B
	Barium	0.0569	0.000670	0.00400			122959-005	SW846-6020B
	Beryllium	ND	0.000200	0.000500	U		122959-005	SW846-6020B
	Cadmium	ND	0.000300	0.00100	U	R	122959-005	SW846-6020B
	Calcium	118	0.800	2.00			122959-005	SW846-6020B
	Chromium	ND	0.00300	0.0100	U		122959-005	SW846-6020B
	Cobalt	ND	0.000300	0.00100	U		122959-005	SW846-6020B
	Copper	ND	0.000300	0.00200	U		122959-005	SW846-6020B
	Iron	ND	0.0330	0.100	U		122959-005	SW846-6020B
	Lead	ND	0.000500	0.00200	U		122959-005	SW846-6020B
	Magnesium	15.8	0.0100	0.0300			122959-005	SW846-6020B
	Manganese	ND	0.00100	0.00500	U	R	122959-005	SW846-6020B
	Mercury	ND	0.0000670	0.000200	U		122959-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122959-005	SW846-6020B
	Potassium	2.17	0.0800	0.300			122959-005	SW846-6020B
	Selenium	0.00793	0.00150	0.00500			122959-005	SW846-6020B
	Silver	ND	0.000300	0.00100	U		122959-005	SW846-6020B
	Sodium	27.9	0.0800	0.250			122959-005	SW846-6020B
	Thallium	ND	0.000600	0.00200	U		122959-005	SW846-6020B
	Uranium	0.00109	0.0000670	0.000200			122959-005	SW846-6020B
	Vanadium	0.00418	0.00330	0.0200	J		122959-005	SW846-6020B
	Zinc	ND	0.00330	0.0200	U		122959-005	SW846-6020B

See notes at end of tables.

Table 6C-5 (continued)
Summary of TAL Metals and Total Uranium Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result [a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
TA2-W-28	Aluminum	ND	0.0193	0.0500	U		122977-005	SW846-6020B
16-Sep-24	Antimony	ND	0.00100	0.00300	U		122977-005	SW846-6020B
	Arsenic	ND	0.00200	0.00500	U		122977-005	SW846-6020B
	Barium	0.185	0.000670	0.00400			122977-005	SW846-6020B
	Beryllium	ND	0.000200	0.000500	U		122977-005	SW846-6020B
	Cadmium	ND	0.000300	0.00100	U		122977-005	SW846-6020B
	Calcium	67.7	0.800	2.00			122977-005	SW846-6020B
	Chromium	ND	0.00300	0.0100	U		122977-005	SW846-6020B
	Cobalt	ND	0.000300	0.00100	U		122977-005	SW846-6020B
	Copper	ND	0.000300	0.00200	U		122977-005	SW846-6020B
	Iron	ND	0.0330	0.100	U		122977-005	SW846-6020B
	Lead	ND	0.000500	0.00200	U		122977-005	SW846-6020B
	Magnesium	13.0	0.0100	0.0300			122977-005	SW846-6020B
	Manganese	ND	0.00100	0.00500	U		122977-005	SW846-6020B
	Mercury	ND	0.0000670	0.000200	U		122977-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122977-005	SW846-6020B
	Potassium	2.10	0.0800	0.300			122977-005	SW846-6020B
	Selenium	0.00365	0.00150	0.00500	J		122977-005	SW846-6020B
	Silver	ND	0.000300	0.00100	U		122977-005	SW846-6020B
	Sodium	20.3	0.0800	0.250			122977-005	SW846-6020B
	Thallium	ND	0.000600	0.00200	U		122977-005	SW846-6020B
	Uranium	0.00140	0.0000670	0.000200			122977-005	SW846-6020B
	Vanadium	0.00651	0.00330	0.0200	J		122977-005	SW846-6020B
	Zinc	ND	0.00330	0.0200	U		122977-005	SW846-6020B

See notes at end of tables.

Table 6C-5 (continued)
Summary of TAL Metals and Total Uranium Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result [a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
TJA-2	Aluminum	ND	0.0193	0.0500	U		122969-005	SW846-6020B
10-Sep-24	Antimony	ND	0.00100	0.00300	U		122969-005	SW846-6020B
	Arsenic	ND	0.00200	0.00500	U		122969-005	SW846-6020B
	Barium	0.0455	0.000670	0.00400			122969-005	SW846-6020B
	Beryllium	ND	0.000200	0.000500	U		122969-005	SW846-6020B
	Cadmium	ND	0.000300	0.00100	U		122969-005	SW846-6020B
	Calcium	77.3	0.800	2.00			122969-005	SW846-6020B
	Chromium	ND	0.00300	0.0100	U		122969-005	SW846-6020B
	Cobalt	ND	0.000300	0.00100	U		122969-005	SW846-6020B
	Copper	ND	0.000300	0.00200	U		122969-005	SW846-6020B
	Iron	ND	0.0330	0.100	U		122969-005	SW846-6020B
	Lead	ND	0.000500	0.00200	U		122969-005	SW846-6020B
	Magnesium	11.5	0.0100	0.0300			122969-005	SW846-6020B
	Manganese	ND	0.00100	0.00500	U		122969-005	SW846-6020B
	Mercury	ND	0.0000670	0.000200	U		122969-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122969-005	SW846-6020B
	Potassium	1.73	0.0800	0.300			122969-005	SW846-6020B
	Selenium	0.00391	0.00150	0.00500	J		122969-005	SW846-6020B
	Silver	ND	0.000300	0.00100	U		122969-005	SW846-6020B
	Sodium	21.9	0.0800	0.250			122969-005	SW846-6020B
	Thallium	ND	0.000600	0.00200	U		122969-005	SW846-6020B
	Uranium	0.00122	0.0000670	0.000200			122969-005	SW846-6020B
	Vanadium	0.00417	0.00330	0.0200	J	J-	122969-005	SW846-6020B
	Zinc	ND	0.00330	0.0200	U		122969-005	SW846-6020B

See notes at end of tables.

Table 6C-5 (continued)
Summary of TAL Metals and Total Uranium Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result [a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
TJA-3	Aluminum	ND	0.0193	0.0500	U		122946-005	SW846-6020B
28-Aug-24	Antimony	ND	0.00100	0.00300	U		122946-005	SW846-6020B
	Arsenic	ND	0.00200	0.00500	U		122946-005	SW846-6020B
	Barium	0.0421	0.000670	0.00400			122946-005	SW846-6020B
	Beryllium	ND	0.000200	0.000500	U		122946-005	SW846-6020B
	Cadmium	ND	0.000300	0.00100	U		122946-005	SW846-6020B
	Calcium	71.1	0.800	2.00			122946-005	SW846-6020B
	Chromium	ND	0.00300	0.0100	U		122946-005	SW846-6020B
	Cobalt	ND	0.000300	0.00100	U		122946-005	SW846-6020B
	Copper	ND	0.000300	0.00200	U		122946-005	SW846-6020B
	Iron	ND	0.0330	0.100	U		122946-005	SW846-6020B
	Lead	ND	0.000500	0.00200	U		122946-005	SW846-6020B
	Magnesium	11.3	0.0100	0.0300			122946-005	SW846-6020B
	Manganese	ND	0.00100	0.00500	U		122946-005	SW846-6020B
	Mercury	ND	0.0000670	0.000200	U		122946-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122946-005	SW846-6020B
	Potassium	1.92	0.0800	0.300			122946-005	SW846-6020B
	Selenium	ND	0.00150	0.00500	U		122946-005	SW846-6020B
	Silver	ND	0.000300	0.00100	U		122946-005	SW846-6020B
	Sodium	24.1	0.0800	0.250			122946-005	SW846-6020B
	Thallium	ND	0.000600	0.00200	U		122946-005	SW846-6020B
	Uranium	0.00237	0.0000670	0.000200			122946-005	SW846-6020B
	Vanadium	0.00409	0.00330	0.0200	J		122946-005	SW846-6020B
	Zinc	ND	0.00330	0.0200	U		122946-005	SW846-6020B

See notes at end of tables.

Table 6C-5 (continued)
Summary of TAL Metals and Total Uranium Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result [a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
TJA-4	Aluminum	ND	0.0193	0.0500	U		122982-005	SW846-6020B
17-Sep-24	Antimony	ND	0.00100	0.00300	U		122982-005	SW846-6020B
	Arsenic	ND	0.00200	0.00500	U		122982-005	SW846-6020B
	Barium	0.188	0.000670	0.00400			122982-005	SW846-6020B
	Beryllium	ND	0.000200	0.000500	U		122982-005	SW846-6020B
	Cadmium	ND	0.000300	0.00100	U		122982-005	SW846-6020B
	Calcium	71.6	0.800	2.00			122982-005	SW846-6020B
	Chromium	ND	0.00300	0.0100	U		122982-005	SW846-6020B
	Cobalt	ND	0.000300	0.00100	U		122982-005	SW846-6020B
	Copper	ND	0.000300	0.00200	U		122982-005	SW846-6020B
	Iron	ND	0.0330	0.100	U		122982-005	SW846-6020B
	Lead	ND	0.000500	0.00200	U		122982-005	SW846-6020B
	Magnesium	14.9	0.0100	0.0300			122982-005	SW846-6020B
	Manganese	ND	0.00100	0.00500	U		122982-005	SW846-6020B
	Mercury	ND	0.0000670	0.000200	U		122982-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122982-005	SW846-6020B
	Potassium	3.36	0.0800	0.300			122982-005	SW846-6020B
	Selenium	0.00318	0.00150	0.00500	J		122982-005	SW846-6020B
	Silver	ND	0.000300	0.00100	U		122982-005	SW846-6020B
	Sodium	27.3	0.0800	0.250			122982-005	SW846-6020B
	Thallium	ND	0.000600	0.00200	U		122982-005	SW846-6020B
	Uranium	0.00295	0.0000670	0.000200			122982-005	SW846-6020B
	Vanadium	0.00697	0.00330	0.0200	J		122982-005	SW846-6020B
	Zinc	ND	0.00330	0.0200	U		122982-005	SW846-6020B

See notes at end of tables.

Table 6C-5 (continued)
Summary of TAL Metals and Total Uranium Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result [a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
TJA-5	Aluminum	ND	0.0193	0.0500	U		122974-005	SW846-6020B
13-Sep-24	Antimony	ND	0.00100	0.00300	U		122974-005	SW846-6020B
	Arsenic	ND	0.00200	0.00500	U		122974-005	SW846-6020B
	Barium	0.0521	0.000670	0.00400			122974-005	SW846-6020B
	Beryllium	ND	0.000200	0.000500	U		122974-005	SW846-6020B
	Cadmium	ND	0.000300	0.00100	U		122974-005	SW846-6020B
	Calcium	84.5	0.800	2.00			122974-005	SW846-6020B
	Chromium	ND	0.00300	0.0100	U		122974-005	SW846-6020B
	Cobalt	ND	0.000300	0.00100	U		122974-005	SW846-6020B
	Copper	ND	0.000300	0.00200	U		122974-005	SW846-6020B
	Iron	ND	0.0330	0.100	U		122974-005	SW846-6020B
	Lead	ND	0.000500	0.00200	U		122974-005	SW846-6020B
	Magnesium	15.0	0.0100	0.0300			122974-005	SW846-6020B
	Manganese	ND	0.00100	0.00500	U		122974-005	SW846-6020B
	Mercury	ND	0.0000670	0.000200	U		122974-005	SW846-7470A
	Nickel	0.000731	0.000600	0.00200	J		122974-005	SW846-6020B
	Potassium	1.85	0.0800	0.300			122974-005	SW846-6020B
	Selenium	0.00424	0.00150	0.00500	J		122974-005	SW846-6020B
	Silver	ND	0.000300	0.00100	U		122974-005	SW846-6020B
	Sodium	23.0	0.0800	0.250			122974-005	SW846-6020B
	Thallium	ND	0.000600	0.00200	U		122974-005	SW846-6020B
	Uranium	0.00216	0.0000670	0.000200			122974-005	SW846-6020B
	Vanadium	0.00564	0.00330	0.0200	J	J-	122974-005	SW846-6020B
	Zinc	ND	0.00330	0.0200	U		122974-005	SW846-6020B

See notes at end of tables.

Table 6C-5 (continued)
Summary of TAL Metals and Total Uranium Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result [a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
TJA-6	Aluminum	ND	0.0193	0.0500	U		122936-005	SW846-6020B
23-Aug-24	Antimony	ND	0.00100	0.00300	U		122936-005	SW846-6020B
	Arsenic	ND	0.00200	0.00500	U		122936-005	SW846-6020B
	Barium	0.0652	0.000670	0.00400			122936-005	SW846-6020B
	Beryllium	ND	0.000200	0.000500	U		122936-005	SW846-6020B
	Cadmium	ND	0.000300	0.00100	U		122936-005	SW846-6020B
	Calcium	62.7	0.800	2.00			122936-005	SW846-6020B
	Chromium	ND	0.00300	0.0100	U		122936-005	SW846-6020B
	Cobalt	ND	0.000300	0.00100	U		122936-005	SW846-6020B
	Copper	ND	0.000300	0.00200	U		122936-005	SW846-6020B
	Iron	ND	0.0330	0.100	U		122936-005	SW846-6020B
	Lead	ND	0.000500	0.00200	U		122936-005	SW846-6020B
	Magnesium	11.7	0.0100	0.0300			122936-005	SW846-6020B
	Manganese	ND	0.00100	0.00500	U		122936-005	SW846-6020B
	Mercury	ND	0.0000670	0.000200	U		122936-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122936-005	SW846-6020B
	Potassium	2.18	0.0800	0.300			122936-005	SW846-6020B
	Selenium	ND	0.00150	0.00500	U		122936-005	SW846-6020B
	Silver	ND	0.000300	0.00100	U		122936-005	SW846-6020B
	Sodium	22.3	0.0800	0.250			122936-005	SW846-6020B
	Thallium	ND	0.000600	0.00200	U		122936-005	SW846-6020B
	Uranium	0.00286	0.0000670	0.000200			122936-005	SW846-6020B
	Vanadium	0.00688	0.00330	0.0200	J		122936-005	SW846-6020B
	Zinc	ND	0.00330	0.0200	U		122936-005	SW846-6020B

See notes at end of tables.

Table 6C-5 (continued)
Summary of TAL Metals and Total Uranium Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result [a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
TJA-7	Aluminum	ND	0.0193	0.0500	U		122985-005	SW846-6020B
18-Sep-24	Antimony	ND	0.00100	0.00300	U		122985-005	SW846-6020B
	Arsenic	ND	0.00200	0.00500	U		122985-005	SW846-6020B
	Barium	0.225	0.000670	0.00400			122985-005	SW846-6020B
	Beryllium	ND	0.000200	0.000500	U		122985-005	SW846-6020B
	Cadmium	ND	0.000300	0.00100	U		122985-005	SW846-6020B
	Calcium	66.4	0.800	2.00			122985-005	SW846-6020B
	Chromium	ND	0.00300	0.0100	U		122985-005	SW846-6020B
	Cobalt	0.00122	0.000300	0.00100			122985-005	SW846-6020B
	Copper	ND	0.000300	0.00200	U		122985-005	SW846-6020B
	Iron	ND	0.0330	0.100	U		122985-005	SW846-6020B
	Lead	ND	0.000500	0.00200	U		122985-005	SW846-6020B
	Magnesium	13.3	0.0100	0.0300			122985-005	SW846-6020B
	Manganese	ND	0.00100	0.00500	U		122985-005	SW846-6020B
	Mercury	ND	0.0000670	0.000200	U		122985-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122985-005	SW846-6020B
	Potassium	2.07	0.0800	0.300			122985-005	SW846-6020B
	Selenium	0.00438	0.00150	0.00500	J		122985-005	SW846-6020B
	Silver	ND	0.000300	0.00100	U		122985-005	SW846-6020B
	Sodium	20.3	0.0800	0.250			122985-005	SW846-6020B
	Thallium	ND	0.000600	0.00200	U		122985-005	SW846-6020B
	Uranium	0.00181	0.0000670	0.000200			122985-005	SW846-6020B
	Vanadium	0.00709	0.00330	0.0200	J		122985-005	SW846-6020B
	Zinc	ND	0.00330	0.0200	U		122985-005	SW846-6020B

See notes at end of tables.

Table 6C-5 (concluded)
Summary of TAL Metals and Total Uranium Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result [a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
WYO-3	Aluminum	ND	0.0193	0.0500	U		122933-005	SW846-6020B
20-Sep-24	Antimony	ND	0.00100	0.00300	U		122933-005	SW846-6020B
	Arsenic	0.00201	0.00200	0.00500	J		122933-005	SW846-6020B
	Barium	0.0481	0.000670	0.00400			122933-005	SW846-6020B
	Beryllium	ND	0.000200	0.000500	U		122933-005	SW846-6020B
	Cadmium	ND	0.000300	0.00100	U		122933-005	SW846-6020B
	Calcium	67.6	0.800	2.00			122933-005	SW846-6020B
	Chromium	ND	0.00300	0.0100	U		122933-005	SW846-6020B
	Cobalt	ND	0.000300	0.00100	U		122933-005	SW846-6020B
	Copper	ND	0.000300	0.00200	U		122933-005	SW846-6020B
	Iron	ND	0.0330	0.100	U		122933-005	SW846-6020B
	Lead	ND	0.000500	0.00200	U		122933-005	SW846-6020B
	Magnesium	13.7	0.0100	0.0300			122933-005	SW846-6020B
	Manganese	ND	0.00100	0.00500	U		122933-005	SW846-6020B
	Mercury	ND	0.0000670	0.000200	U		122933-005	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122933-005	SW846-6020B
	Potassium	2.42	0.0800	0.300			122933-005	SW846-6020B
	Selenium	0.00167	0.00150	0.00500	J		122933-005	SW846-6020B
	Silver	ND	0.000300	0.00100	U		122933-005	SW846-6020B
	Sodium	27.7	0.0800	0.250			122933-005	SW846-6020B
	Thallium	ND	0.000600	0.00200	U		122933-005	SW846-6020B
	Uranium	0.00390	0.0000670	0.000200			122933-005	SW846-6020B
	Vanadium	0.00735	0.00330	0.0200	J		122933-005	SW846-6020B
	Zinc	ND	0.00330	0.0200	U		122933-005	SW846-6020B

See notes at end of tables.

Table 6C-6
Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, and Tritium Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Activity [a] (pCi/L)	MDA [b] (pCi/L)	Critical Level [c] (pCi/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
TA1-W-02	Americium-241	0.0128 ± 15.0	26.9	12.9	U	BD	122929-006	EPA 901.1
22-Aug-24	Cesium-137	-1.29 ± 2.10	3.40	1.60	U	BD	122929-006	EPA 901.1
	Cobalt-60	-3.15 ± 4.44	5.17	2.42	U	BD	122929-006	EPA 901.1
	Potassium-40	14.6 ± 54.1	36.3	16.5	U	BD	122929-006	EPA 901.1
	Gross Alpha	1.12	NA	NA	NA	None	122929-007	EPA 900.0/SW846-9310
	Gross Beta	2.96 ± 0.821	1.25	0.605		J	122929-007	EPA 900.0/SW846-9310
	Tritium	-42.4 ± 101	182	86.6	U	BD	122929-008	EPA 906.0M
TA1-W-06	Americium-241	-2.66 ± 8.62	13.5	6.52	U	BD	122965-006	EPA 901.1
05-Sep-24	Cesium-137	0.412 ± 1.61	2.85	1.35	U	BD	122965-006	EPA 901.1
	Cobalt-60	-0.0558 ± 1.62	2.77	1.26	U	BD	122965-006	EPA 901.1
	Potassium-40	-20.3 ± 30.7	37.2	17.4	U	BD	122965-006	EPA 901.1
	Gross Alpha	0.71	NA	NA	NA	None	122965-007	EPA 900.0/SW846-9310
	Gross Beta	2.51 ± 0.966	1.49	0.716		J	122965-007	EPA 900.0/SW846-9310
	Tritium	-7.36 ± 56.3	106	47.9	U	BD	122965-008	EPA 906.0M
TA1-W-08	Americium-241	2.92 ± 15.2	27.2	13.1	U	BD	122967-006	EPA 901.1
11-Sep-24	Cesium-137	0.838 ± 2.13	3.64	1.72	U	BD	122967-006	EPA 901.1
	Cobalt-60	-3.64 ± 4.76	5.45	2.56	U	BD	122967-006	EPA 901.1
	Potassium-40	-42.9 ± 63.4	63.4	30.0	U	BD	122967-006	EPA 901.1
	Gross Alpha	1.11	NA	NA	NA	None	122967-007	EPA 900.0/SW846-9310
	Gross Beta	-2.16 ± 2.85	5.04	2.45	U, *	BD	122967-007	EPA 900.0/SW846-9310
	Tritium	-55.1 ± 77.7	161	71.7	U	BD	122967-008	EPA 906.0M
TA2-NW1-325	Americium-241	4.34 ± 9.12	14.6	7.10	U	BD	122961-006	EPA 901.1
09-Sep-24	Cesium-137	0.491 ± 4.03	2.99	1.41	U	BD	122961-006	EPA 901.1
	Cobalt-60	1.61 ± 1.94	3.52	1.63	U	BD	122961-006	EPA 901.1
	Potassium-40	67.7 ± 34.0	30.0	13.7		J	122961-006	EPA 901.1
	Gross Alpha	0.31	NA	NA	NA	None	122961-007	EPA 900.0/SW846-9310
	Gross Beta	2.91 ± 0.906	1.38	0.669	*	J	122961-007	EPA 900.0/SW846-9310
	Tritium	31.9 ± 85.7	157	67.0	U	BD	122961-008	EPA 906.0M
TA2-NW1-595	Americium-241	-4.96 ± 8.47	14.3	6.93	U	BD	122943-006	EPA 901.1
27-Aug-24	Cesium-137	0.117 ± 4.29	2.67	1.25	U	BD	122943-006	EPA 901.1
	Cobalt-60	0.813 ± 1.58	2.98	1.36	U	BD	122943-006	EPA 901.1
	Potassium-40	29.6 ± 49.6	29.6	13.5	U	BD	122943-006	EPA 901.1
	Gross Alpha	1.10	NA	NA	NA	None	122943-007	EPA 900.0/SW846-9310
	Gross Beta	2.42 ± 0.813	1.25	0.607		J	122943-007	EPA 900.0/SW846-9310
	Tritium	-60.1 ± 95.3	190	86.0	U	BD	122943-008	EPA 906.0M

See notes at end of tables.

Table 6C-6 (continued)
Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, and Tritium Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Activity [a] (pCi/L)	MDA [b] (pCi/L)	Critical Level [c] (pCi/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
TA2-W-01	Americium-241	1.38 ± 4.57	7.50	3.63	U	BD	122955-006	EPA 901.1
03-Sep-24	Cesium-137	-0.476 ± 1.66	2.77	1.31	U	BD	122955-006	EPA 901.1
	Cobalt-60	-2.28 ± 2.66	2.90	1.33	U	BD	122955-006	EPA 901.1
	Potassium-40	28.2 ± 44.0	29.2	13.4	U	BD	122955-006	EPA 901.1
	Gross Alpha	0.03	NA	NA	NA	None	122955-007	EPA 900.0/SW846-9310
	Gross Beta	2.76 ± 0.940	1.43	0.684		J	122955-007	EPA 900.0/SW846-9310
	Tritium	39.8 ± 109	187	89.3	U	BD	122955-008	EPA 906.0M
TA2-W-19	Americium-241	6.07 ± 8.95	14.4	6.97	U	BD	122971-006	EPA 901.1
12-Sep-24	Cesium-137	-0.766 ± 1.89	3.18	1.51	U	BD	122971-006	EPA 901.1
	Cobalt-60	0.409 ± 1.70	3.22	1.48	U	BD	122971-006	EPA 901.1
	Potassium-40	-24.7 ± 38.1	44.9	21.1	U	BD	122971-006	EPA 901.1
	Gross Alpha	0.75	NA	NA	NA	None	122971-007	EPA 900.0/SW846-9310
	Gross Beta	2.97 ± 0.864	1.32	0.640	*	J	122971-007	EPA 900.0/SW846-9310
	Tritium	-14.6 ± 83.1	161	71.4	U	BD	122971-008	EPA 906.0M
TA2-W-24	Americium-241	0.0688 ± 8.47	15.4	7.39	U	BD	129926-006	EPA 901.1
21-Aug-24	Cesium-137	0.929 ± 1.95	3.45	1.62	U	BD	129926-006	EPA 901.1
	Cobalt-60	-0.799 ± 2.31	3.93	1.80	U	BD	129926-006	EPA 901.1
	Potassium-40	16.0 ± 51.7	33.3	15.0	U	BD	129926-006	EPA 901.1
	Gross Alpha	0.46	NA	NA	NA	None	129926-007	EPA 900.0/SW846-9310
	Gross Beta	5.35 ± 0.719	0.937	0.453			129926-007	EPA 900.0/SW846-9310
	Tritium	-0.0862 ± 112	198	94.3	U	BD	129926-008	EPA 906.0M
TA2-W-25	Americium-241	3.15 ± 5.61	8.95	4.33	U	BD	122939-006	EPA 901.1
26-Aug-24	Cesium-137	0.809 ± 1.48	2.61	1.23	U	BD	122939-006	EPA 901.1
	Cobalt-60	0.848 ± 1.51	2.87	1.31	U	BD	122939-006	EPA 901.1
	Potassium-40	-19.0 ± 31.3	39.5	18.5	U	BD	122939-006	EPA 901.1
	Gross Alpha	0.48	NA	NA	NA	None	122939-007	EPA 900.0/SW846-9310
	Gross Beta	1.53 ± 0.860	1.40	0.680		J	122939-007	EPA 900.0/SW846-9310
	Tritium	28.1 ± 84.3	153	67.1	U	BD	122939-008	EPA 906.0M
TA2-W-26	Americium-241	2.68 ± 4.90	7.93	3.85	U	BD	122987-006	EPA 901.1
19-Sep-24	Cesium-137	1.31 ± 1.64	2.65	1.25	U	BD	122987-006	EPA 901.1
	Cobalt-60	-0.494 ± 1.55	2.66	1.21	U	BD	122987-006	EPA 901.1
	Potassium-40	19.9 ± 38.3	31.2	14.4	U	BD	122987-006	EPA 901.1
	Gross Alpha	0.05	NA	NA	NA	None	122987-007	EPA 900.0/SW846-9310
	Gross Beta	1.61 ± 0.594	0.898	0.429	*	J	122987-007	EPA 900.0/SW846-9310
	Tritium	76.0 ± 77.2	124	52.9	N, U	BD	122987-008	EPA 906.0M

See notes at end of tables.

Table 6C-6 (continued)
Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, and Tritium Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Activity [a] (pCi/L)	MDA [b] (pCi/L)	Critical Level [c] (pCi/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
TA2-W-27	Americium-241	5.41 ± 9.15	15.1	7.25	U	BD	122959-006	EPA 901.1
04-Sep-24	Cesium-137	2.38 ± 2.63	2.67	1.26	U	BD	122959-006	EPA 901.1
	Cobalt-60	1.19 ± 2.08	3.00	1.38	U	BD	122959-006	EPA 901.1
	Potassium-40	-23.5 ± 36.6	42.8	20.2	U	BD	122959-006	EPA 901.1
	Gross Alpha	1.02	NA	NA	NA	None	122959-007	EPA 900.0/SW846-9310
	Gross Beta	2.59 ± 0.984	1.52	0.730		J	122959-007	EPA 900.0/SW846-9310
	Tritium	-4.04 ± 79.2	148	66.9	U	BD	122959-008	EPA 906.0M
TA2-W-28	Americium-241	-1.12 ± 8.55	13.6	6.58	U	BD	122977-006	EPA 901.1
16-Sep-24	Cesium-137	1.93 ± 1.70	2.79	1.32	U	BD	122977-006	EPA 901.1
	Cobalt-60	-1.15 ± 1.54	2.45	1.11	U	BD	122977-006	EPA 901.1
	Potassium-40	5.52 ± 30.3	42.7	20.2	U	BD	122977-006	EPA 901.1
	Gross Alpha	0.56	NA	NA	NA	None	122977-007	EPA 900.0/SW846-9310
	Gross Beta	1.77 ± 0.776	1.23	0.594	*	J	122977-007	EPA 900.0/SW846-9310
	Tritium	-59.5 ± 89.9	182	81.7	U	BD	122977-008	EPA 906.0M
TJA-2	Americium-241	-9.10 ± 22.7	24.2	11.6	U	BD	122969-006	EPA 901.1
10-Sep-24	Cesium-137	2.14 ± 2.26	3.88	1.83	U	BD	122969-006	EPA 901.1
	Cobalt-60	2.03 ± 2.53	4.71	2.17	U	BD	122969-006	EPA 901.1
	Potassium-40	89.7 ± 54.9	44.3	20.4	X	R	122969-006	EPA 901.1
	Gross Alpha	0.29	NA	NA	NA	None	122969-007	EPA 900.0/SW846-9310
	Gross Beta	2.35 ± 0.916	1.45	0.705	*	J	122969-007	EPA 900.0/SW846-9310
	Tritium	16.0 ± 83.3	158	67.4	U	BD	122969-008	EPA 906.0M
TJA-3	Americium-241	-1.13 ± 10.5	18.8	8.87	U	BD	122946-006	EPA 901.1
28-Aug-24	Cesium-137	-2.08 ± 2.95	4.64	2.10	U	BD	122946-006	EPA 901.1
	Cobalt-60	2.81 ± 3.18	6.36	2.83	U	BD	122946-006	EPA 901.1
	Potassium-40	26.0 ± 58.1	47.7	20.3	U	BD	122946-006	EPA 901.1
	Gross Alpha	1.16	NA	NA	NA	None	122946-007	EPA 900.0/SW846-9310
	Gross Beta	2.47 ± 0.593	0.854	0.412		J	122946-007	EPA 900.0/SW846-9310
	Tritium	31.5 ± 79.3	142	62.7	U	BD	122946-008	EPA 906.0M
TJA-4	Americium-241	4.97 ± 11.2	19.8	9.59	U	BD	122982-006	EPA 901.1
17-Sep-24	Cesium-137	0.484 ± 4.10	4.61	2.21	U	BD	122982-006	EPA 901.1
	Cobalt-60	-0.762 ± 2.12	3.61	1.66	U	BD	122982-006	EPA 901.1
	Potassium-40	22.5 ± 65.0	32.8	14.9	U	BD	122982-006	EPA 901.1
	Gross Alpha	-0.26	NA	NA	NA	None	122982-007	EPA 900.0/SW846-9310
	Gross Beta	3.36 ± 0.729	1.05	0.510	*		122982-007	EPA 900.0/SW846-9310
	Tritium	32.0 ± 106	191	85.7	U	BD	122982-008	EPA 906.0M

See notes at end of tables.

Table 6C-6 (concluded)
Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, and Tritium Results for Waste Characterization Samples, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Activity [a] (pCi/L)	MDA [b] (pCi/L)	Critical Level [c] (pCi/L)	Laboratory Qualifier [e]	Validation Qualifier [f]	Sample No.	Analytical Method [g]
TJA-5	Americium-241	5.14 ± 6.00	9.23	4.47	U	BD	122974-006	EPA 901.1
13-Sep-24	Cesium-137	0.462 ± 1.63	2.86	1.35	U	BD	122974-006	EPA 901.1
	Cobalt-60	1.57 ± 1.88	3.41	1.58	U	BD	122974-006	EPA 901.1
	Potassium-40	11.0 ± 33.2	30.2	13.8	U	BD	122974-006	EPA 901.1
	Gross Alpha	1.04	NA	NA	NA	None	122974-007	EPA 900.0/SW846-9310
	Gross Beta	2.75 ± 0.957	1.50	0.727	*	J	122974-007	EPA 900.0/SW846-9310
	Tritium	-39.7 ± 73.2	135	63.6	U	BD	122974-008	EPA 906.0M
TJA-6	Americium-241	6.95 ± 9.31	15.3	7.41	U	BD	122936-006	EPA 901.1
23-Aug-24	Cesium-137	0.471 ± 1.88	3.26	1.55	U	BD	122936-006	EPA 901.1
	Cobalt-60	-0.319 ± 2.01	3.50	1.61	U	BD	122936-006	EPA 901.1
	Potassium-40	-42.5 ± 51.3	57.1	27.2	U	BD	122936-006	EPA 901.1
	Gross Alpha	0.45	NA	NA	NA	None	122936-007	EPA 900.0/SW846-9310
	Gross Beta	4.25 ± 0.755	0.979	0.469			122936-007	EPA 900.0/SW846-9310
	Tritium	2.51 ± 102	180	85.7	U	BD	122936-008	EPA 906.0M
TJA-7	Americium-241	-14.3 ± 19.0	28.6	13.9	U	BD	122985-006	EPA 901.1
18-Sep-24	Cesium-137	-0.186 ± 1.78	3.05	1.44	U	BD	122985-006	EPA 901.1
	Cobalt-60	0.302 ± 1.65	3.10	1.41	U	BD	122985-006	EPA 901.1
	Potassium-40	-33.2 ± 39.6	45.4	21.3	U	BD	122985-006	EPA 901.1
	Gross Alpha	0.03	NA	NA	NA	None	122985-007	EPA 900.0/SW846-9310
	Gross Beta	1.87 ± 0.970	1.58	0.772	*	J	122985-007	EPA 900.0/SW846-9310
	Tritium	23.0 ± 106	184	87.4	U	BD	122985-008	EPA 906.0M
WYO-3	Americium-241	-1.16 ± 6.48	10.5	5.09	U	BD	122933-006	EPA 901.1
20-Aug-24	Cesium-137	0.546 ± 1.50	2.67	1.26	U	BD	122933-006	EPA 901.1
	Cobalt-60	-0.0950 ± 1.50	2.75	1.26	U	BD	122933-006	EPA 901.1
	Potassium-40	-12.2 ± 30.8	40.8	19.2	U	BD	122933-006	EPA 901.1
	Gross Alpha	1.01	NA	NA	NA	None	122933-007	EPA 900.0/SW846-9310
	Gross Beta	3.43 ± 0.677	0.898	0.427	*	NJ+	122933-007	EPA 900.0/SW846-9310
	Tritium	104 ± 84.1	127	54.3	N, U	BD	122933-008	EPA 906.0M

See notes at end of tables.

Table 6C-7
Summary of Field Water Quality Parameter Measurements, Tijeras Arroyo Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Sample Date	Temperature [h] (^{0}C)	Specific Conductivity[h] (µmho/cm)	Oxidation Reduction Potential [h] (mV)	pH [h]	Turbidity [h] (NTU)	Dissolved Oxygen [h] (% Sat)	Dissolved Oxygen [h] (mg/L)
TA1-W-06	20-Feb-24	19.83	824.68	86.7	7.57	2.59	97.90	7.27
TA1-W-08	28-Feb-24	15.12	1657.8	158.9	7.47	0.23	91.76	7.48
TA2-NW1-325	19-Feb-24	15.19	575.61	89.7	7.52	1.75	93.30	7.61
TA2-W-01	22-Feb-24	18.73	576.23	108.9	7.59	0.61	99.03	7.50
TA2-W-19	29-Feb-24	17.81	503.75	100.3	7.67	0.40	110.81	8.53
TA2-W-26	27-Feb-24	16.30	561.52	179.8	7.55	5.01	96.48	7.60
TA2-W-27	21-Feb-24	17.27	710.86	79.9	7.61	0.35	96.14	7.48
TA2-W-28	06-Mar-24	18.86	473.14	108.6	7.61	0.02	104.33	7.86
TJA-2	04-Mar-24	17.49	510.85	98.8	7.66	0.39	102.21	8.00
TJA-5	05-Mar-24	18.26	521.60	108.8	7.63	0.18	104.71	8.08
TJA-7	07-Mar-24	19.98	476.92	107.6	7.60	0.45	102.10	7.45
TA1-W-02	22-Aug-24	21.48	541.54	68.6	7.41	1.24	74.85	5.44
TA1-W-06	05-Sep-24	20.64	973.41	101.1	7.58	0.97	90.98	6.89
TA1-W-08	11-Sep-24	19.75	2169.3	114.2	7.45	0.72	94.52	7.03
TA2-NW1-325	09-Sep-24	22.09	768.18	134.0	7.41	0.64	98.10	7.08
TA2-NW1-595	27-Aug-24	20.24	690.54	83.0	7.28	0.72	104.55	7.82
TA2-W-01	03-Sep-24	18.56	693.89	116.4	7.57	0.20	93.52	7.21
TA2-W-19	12-Sep-24	19.59	618.57	108.2	7.65	0.66	110.59	8.29
TA2-W-24	21-Aug-24	21.42	467.43	70.6	7.49	0.79	54.25	3.96
TA2-W-25	26-Aug-24	21.19	544.45	69.7	7.42	0.18	100.74	7.41
TA2-W-26	19-Sep-24	24.44	859.16	104.2	7.51	8.81	105.45	7.12
TA2-W-26	06-Nov-24	13.72	753.11	107.6	7.51	13.7	92.45	7.82
TA2-W-27	04-Sep-24	18.95	859.77	105.3	7.57	0.43	89.36	6.89
TA2-W-28	16-Sep-24	19.81	583.74	103.0	7.65	0.82	99.01	7.41
TJA-2	10-Sep-24	19.40	631.60	106.3	7.63	0.16	99.88	7.57
TJA-3	28-Aug-24	20.86	541.58	69.4	7.41	0.28	89.87	6.62
TJA-4	17-Sep-24	19.20	632.19	100.3	7.57	0.80	74.57	5.65
TJA-5	13-Sep-24	19.74	628.32	117.2	7.62	1.62	110.26	8.40
TJA-6	23-Aug-24	22.01	491.71	71.6	7.46	0.88	80.49	5.81
TJA-7	18-Sep-24	18.15	568.67	121.5	7.63	0.77	93.01	7.21
WYO-3	20-Aug-24	20.89	574.42	108.1	7.61	0.28	110.15	8.11
WYO-3	05-Nov-24	19.73	534.27	95.6	7.60	0.39	113.83	8.51

See notes at end of tables.

Notes for Tijeras Arroyo Groundwater Area of Concern Analytical Results Tables

%	= percent
CFR	= Code of Federal Regulations
EPA	= U.S. Environmental Protection Agency
ID	= Identifier
□g/L	= micrograms per liter
mg/L	= milligrams per liter
mrem/yr	= millirem per year
No.	= Number
pCi/L	= picocuries per liter
TAL	= Target Analyte List

[a]Result or Activity

Result applies to Tables 6C-1, 6C-2, 6C-4, and 6C-5. Activity applies to Table 6C-6.

Activity	= Gross alpha activity measurements were corrected by subtracting out the total uranium activity (40 CFR Part 141). Activities of zero or less are considered not detected.
Bold	= Value exceeded the established nitrate MCL/MAC.
ND	= not detected (at method detection limit).

[b]MDL or MDA

The MDL applies to Tables 6C-1 through 6C-5. MDA applies to Table 6C-6.

MDA	= The minimal detectable activity or minimum measured activity in a sample required to ensure a 95% probability that the measured activity is accurately quantified above the critical level.
MDL	= Method detection limit. The minimum concentration or activity that can be measured and reported with 99% confidence that the analyte is greater than zero, analyte is matrix specific.
NA	= Not applicable for gross alpha activities. The MDA could not be calculated as the gross alpha activity Was corrected by subtracting out the total uranium activity.

[c]PQL or Critical Level

The PQL applies to 6C-1, 6C-2, 6C-4, and 6C-5. Critical Level applies to Table 6C-6.

Critical Level	= The minimum activity that can be measured and reported with 99% confidence that the analyte is greater than zero, analyte is matrix specific.
NA	= Not applicable for gross alpha activities. The critical level could not be calculated as the gross alpha activity was corrected by subtracting out the total uranium activity.
PQL	= Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.

[d]MCL

MCL	= Maximum contaminant level. Established by the EPA (EPA, May 2018).

[e]Lab Qualifier

B	= The analyte was found in the blank above the effective MDL.
J	= Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL.
N	= Results associated with a spike analysis that was outside control limits.
NA	= Not applicable.
U	= Analyte is absent or below the method detection limit.
X	= Uncertain identification for gamma spectroscopy.
*	= Recovery or %RPD not within acceptance limits and/or spike amount not compatible with the sample or the duplicate RPD's are not applicable where the concentration falls below the effective PQL.

[f]Validation Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

BD	= Below detection limit as used in radiochemistry to identify results that are not statistically different from zero.
J	= The associated value is an estimated quantity.
J+	= The associated numerical value is an estimated quantity with a suspected positive bias.
J-	= The associated numerical value is an estimated quantity with a suspected negative bias.
None	= No data validation for corrected gross alpha activity.
NJ+	= Presumptive evidence of the presence of the material at an estimated quantity with a suspected positive bias.
UJ	= The analyte was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	= The data are unusable, and resampling or reanalysis are necessary for verification.

Notes for Tijeras Arroyo Groundwater Area of Concern Analytical Results Tables (concluded)

[g]Analytical Method

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HASL	= Health and Safety Laboratory
SM	= Standard Method
SW	= Solid Waste

[h]Field Water Quality Parameter Measurements

Field measurements collected prior to sampling.

OC	= degrees Celsius
% sat	= percent saturation
mho/cm	= micromhos per centimeter
mg/L	= milligrams per liter
mV	= millivolts
NTU	= nephelometric turbidity units
pH	= potential of hydrogen (negative logarithm of the hydrogen ion concentration)

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Attachment 6D
Tijeras Arroyo Groundwater Area of Concern Plots

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Attachment 6D Plots

Figure 6D-1 Nitrate plus Nitrite Concentrations Trend Plot, PGWS Monitoring Well TA2-W-19 ..... 6D-5

Figure 6D-2 Nitrate plus Nitrite Concentrations, PGWS Monitoring Wells TA2-W-28 and TA2-SW1-320 ..... 6D-6

Figure 6D-3 Nitrate plus Nitrite Concentrations Trend Plot, PGWS Monitoring Well TJA-2 ..... 6D-7

Figure 6D-4 Nitrate plus Nitrite Concentrations Trend Plot, PGWS Monitoring Well TJA-5 ..... 6D-8

Figure 6D-5 Nitrate plus Nitrite Concentrations Trend Plot, PGWS Monitoring Well TJA-7 ..... 6D-9

Figure 6D-6 Nitrate plus Nitrite Concentrations Trend Plot, Merging Zone Monitoring Well TJA-4 ..... 6D-10

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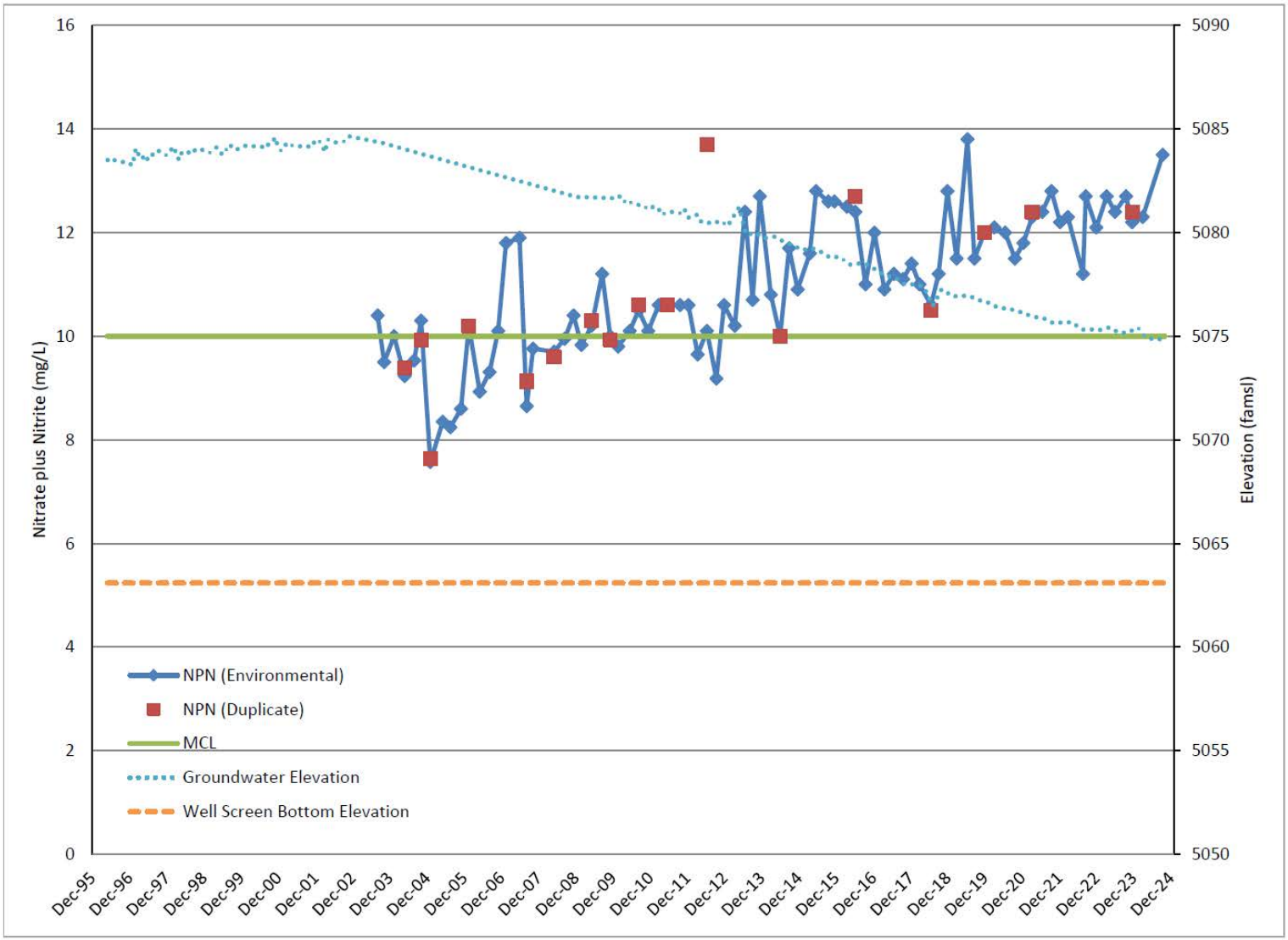


Figure 6D-1
Nitrate plus Nitrite Concentrations Trend Plot, PGWS Monitoring Well TA2-W-19

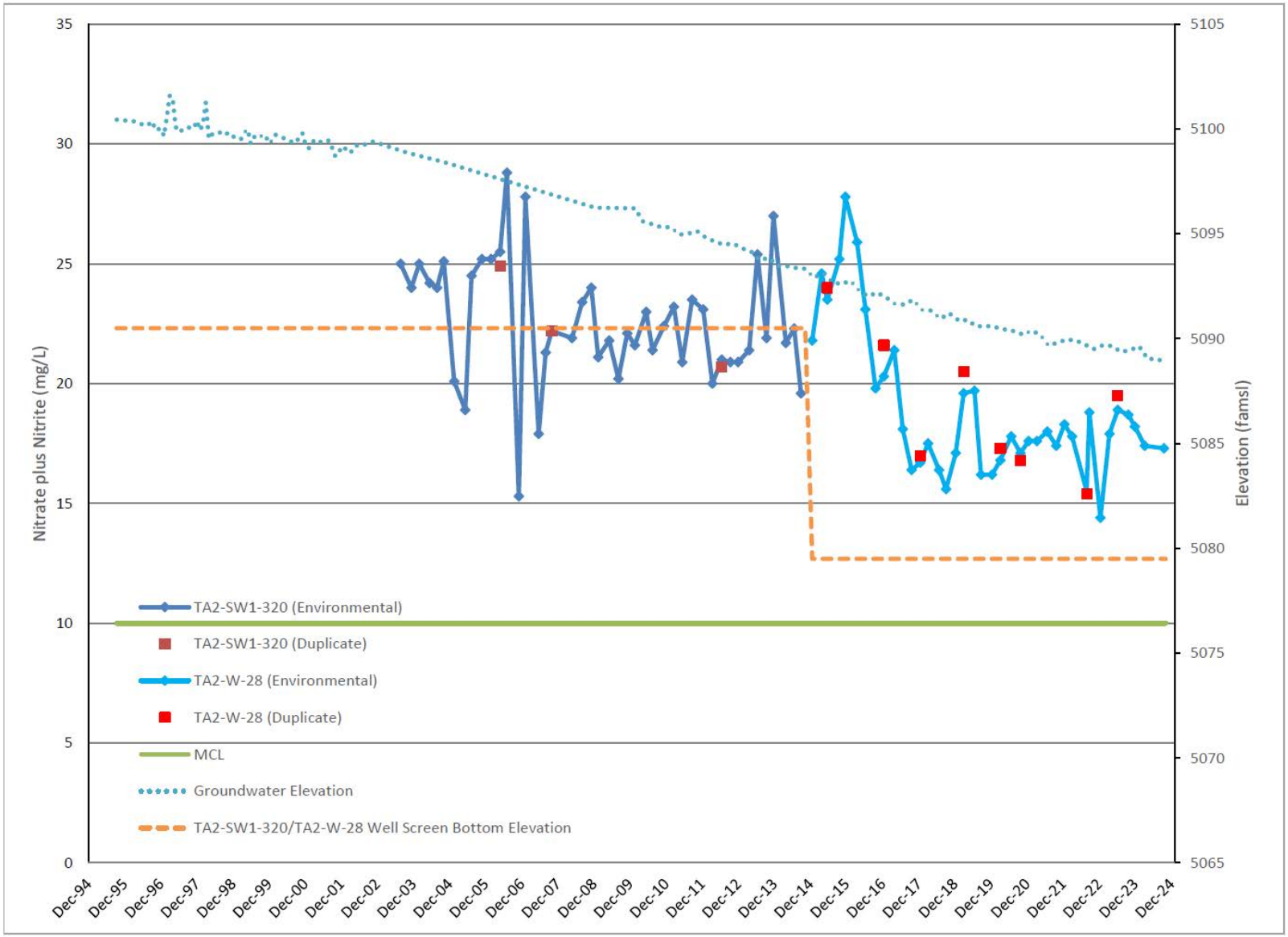


Figure 6D-2
Nitrate plus Nitrite Concentrations, PGWS Monitoring Wells TA2-W-28 and TA2-SW1-320

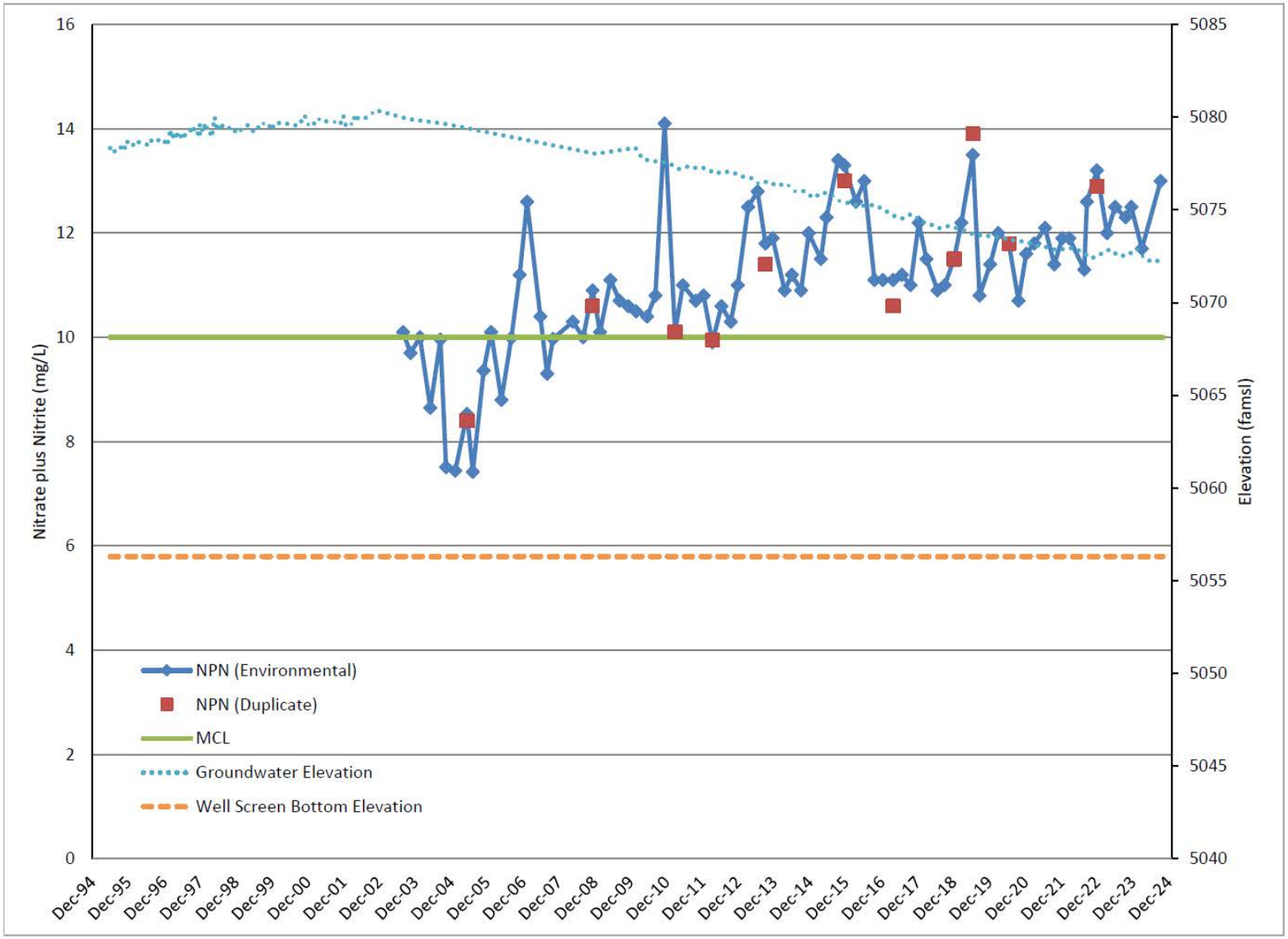


Figure 6D-3
Nitrate plus Nitrite Concentrations, PGWS Monitoring Well TJA-2

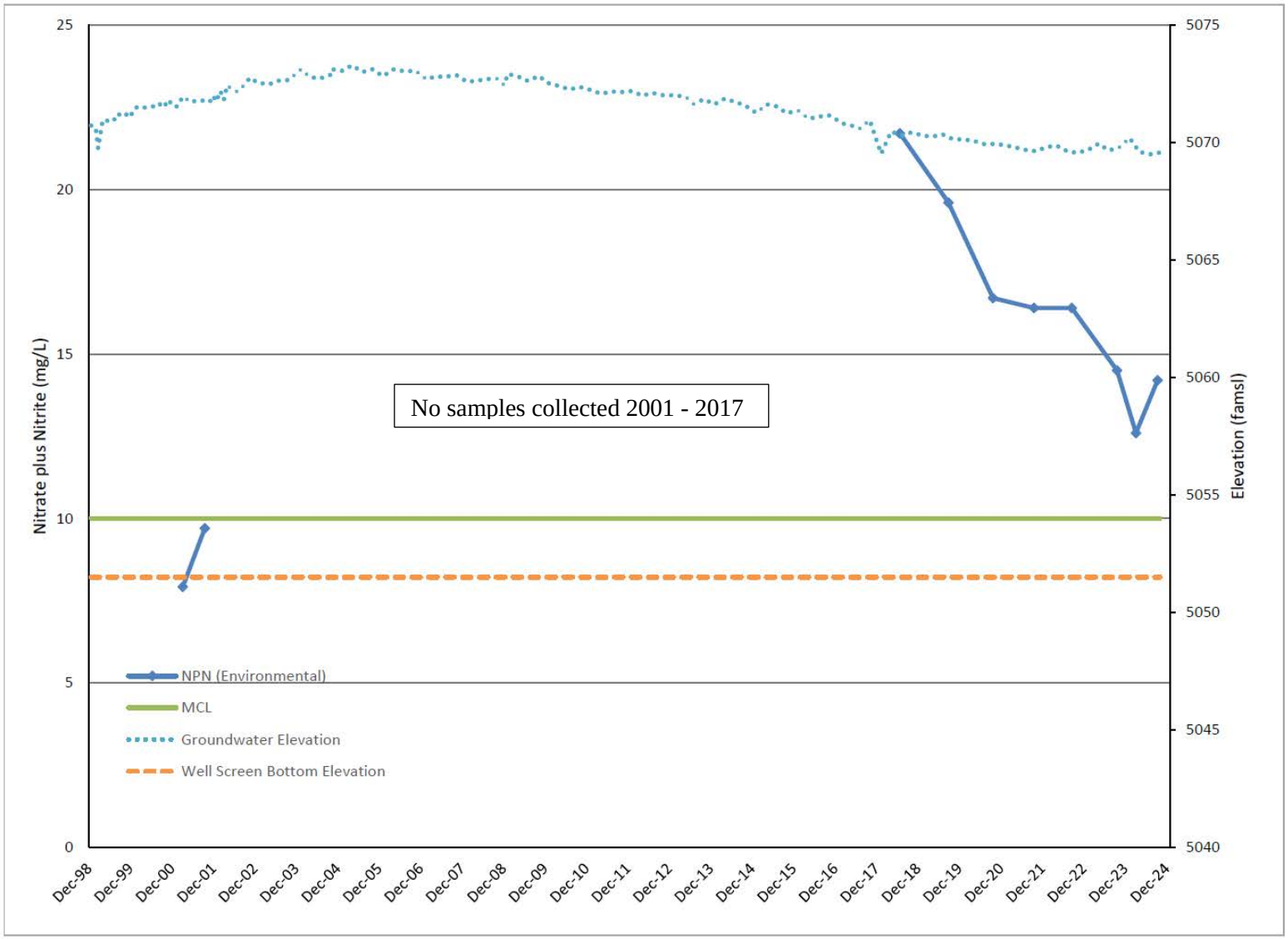


Figure 6D-4
Nitrate plus Nitrite Concentrations, PGWS Monitoring Well TJA-5

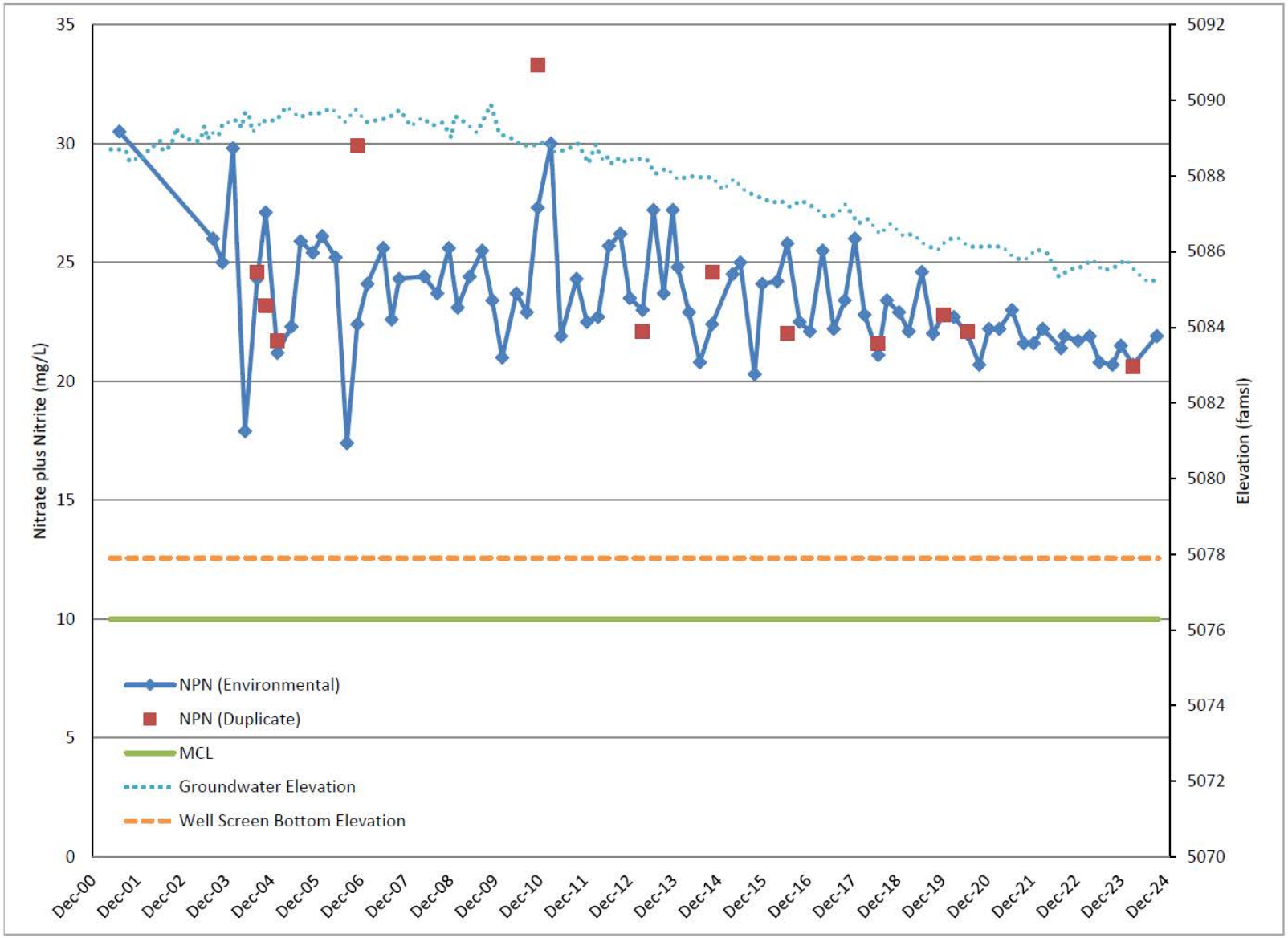


Figure 6D-5
Nitrate plus Nitrite Concentrations, PGWS Monitoring Well TJA-7

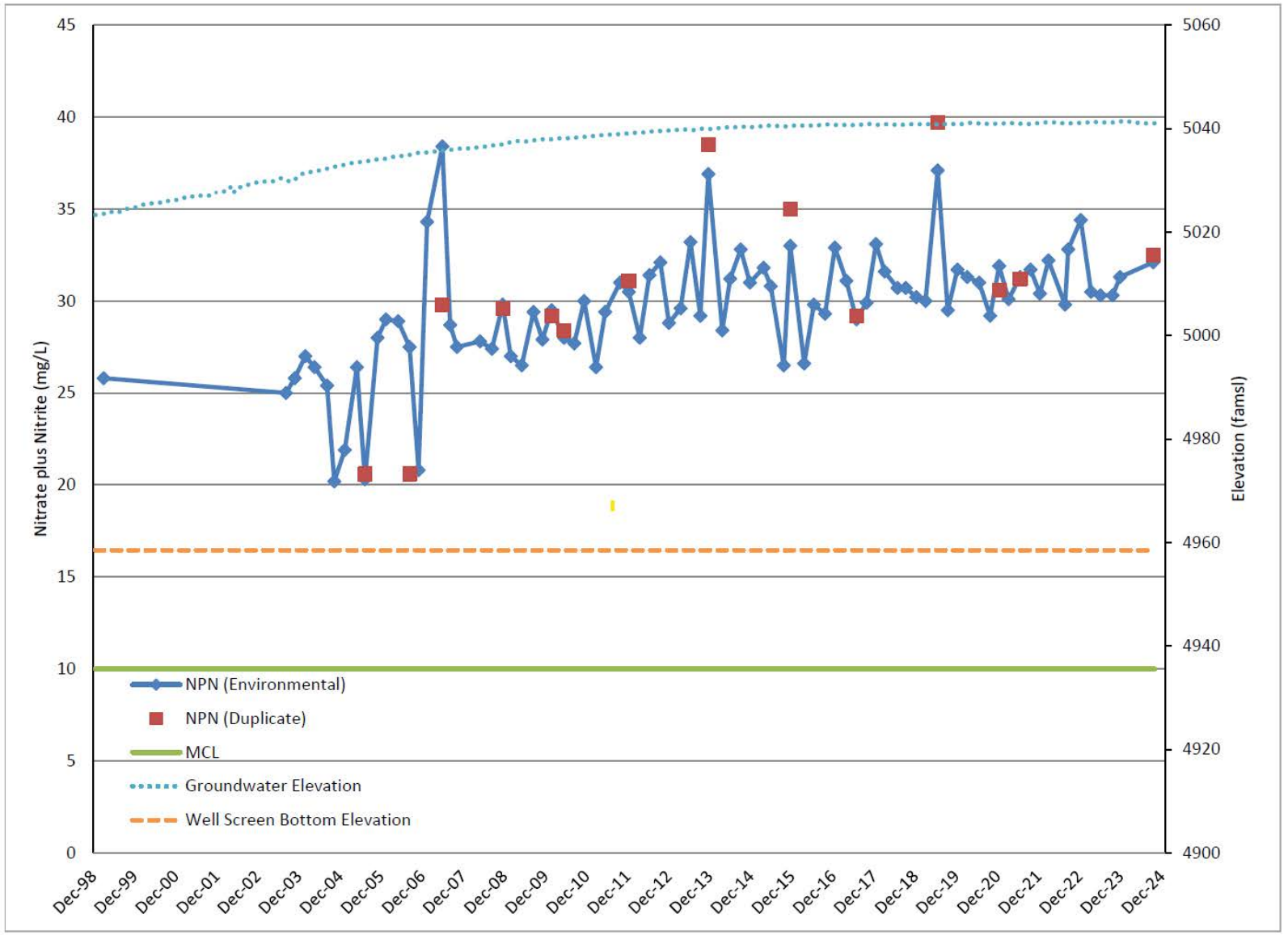


Figure 6D-6
Nitrate plus Nitrite Concentrations, Merging Zone Monitoring Well TJA-4

Chapter 6.0
Tijeras Arroyo Groundwater Area of Concern References

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7.0 Burn Site Groundwater Area of Concern

7.1 Introduction

This chapter summarizes the calendar year (CY) 2024 Burn Site Groundwater (BSG) Area of Concern (AOC) groundwater monitoring activities and results.

Located in the Manzanita Mountains (Figure 7-1), the BSG AOC is an area with low concentrations of nitrate in a fractured bedrock aquifer system. Nitrate has been identified as a constituent of concern (COC) in the groundwater based on detections above the U.S. Environmental Protection Agency maximum contaminant level (EPA MCL) in samples collected from several monitoring wells. Since August 1998, the maximum nitrate concentration detected has been 49.6 mg/L. The EPA MCL and the New Mexico Water Quality Control Commission maximum allowable concentration (MAC) for nitrate is 10 mg/L (EPA, March 2018; NMWQCC, December 2018).

Because the EPA MCL and MAC for nitrate are the same, the term EPA MCL is used in this chapter and its attachments for both regulatory standards.

7.1.1 Location

The Coyote Canyon Test Area is located along the eastern part of Kirtland Air Force Base (KAFB). The Burn Site is in Lurance Canyon, one of three canyons located on the eastern edge of the Coyote Canyon Test Area and in the Manzanita Mountains. Two other canyons, Madera Canyon and Sol se Mete Canyon, intersect Lurance Canyon immediately west of the Burn Site. These three canyons are the headwaters of Arroyo del Coyote, which is a tributary to Tijeras Arroyo. Testing activities at the Lurance Canyon Burn Site Testing Facility, which includes the Burn Site, began in 1967.

The BSG AOC is located along the eastern margin of the Albuquerque Basin. The terrain is characterized by large topographic relief exceeding 500 ft. Lurance Canyon, deeply incised into Paleozoic and Precambrian rocks, provides local westward drainage of ephemeral surface water flows to Arroyo del Coyote.

7.1.2 Site History

Groundwater issues at the BSG AOC are primarily associated with two Solid Waste Management Units (SWMUs) that have completed corrective action. The Lurance Canyon Burn Site (SWMU 94) and the nearby Lurance Canyon Explosive Test Site (SWMU 65) have been used since 1967. Most of the operational activities have involved testing the fire survivability of transportation containers, weapons components, simulated weapons, and satellite components. Historical operations (Attachment 7A, Table 7A-1) included open detonation of high explosive (HE) compounds and ammonium-nitrate slurry, along with open burning of HE compounds, liquid-slurry propellants, and solid propellants. Most HE tests occurred between 1967 and 1975 and were completely phased out by the 1980s.

Burn testing began in the early 1970s and has continued to the present. Early burn testing was conducted in unlined pits excavated in native soil and alluvium. By 1975, portable steel burn pans were used for open burning, mostly using jet propellant, fuel grade 4 (JP-4). Several engineered structures, such as the Light Air Transport Accident Resistant Container Unit, were used at the Burn Site. The structures mostly used JP-4 and occasionally used diesel fuel and gasoline to create the high temperatures associated with transportation accidents. In the mid-1990s, jet propellant fuel grade 8 replaced JP-4 as the petroleum fuel used for burn tests. Most test structures have been dismantled. Over the past decade, the amount of testing at the Lurance Canyon Burn Site Testing Facility has been significantly reduced, with most burn tests conducted at the Thermal Test Complex in Technical Area-III. The only remaining test cell is the Fire Laboratory for Accreditation of Modeling by Experiment. Portable burn pans up to 25 ft in diameter are occasionally used.

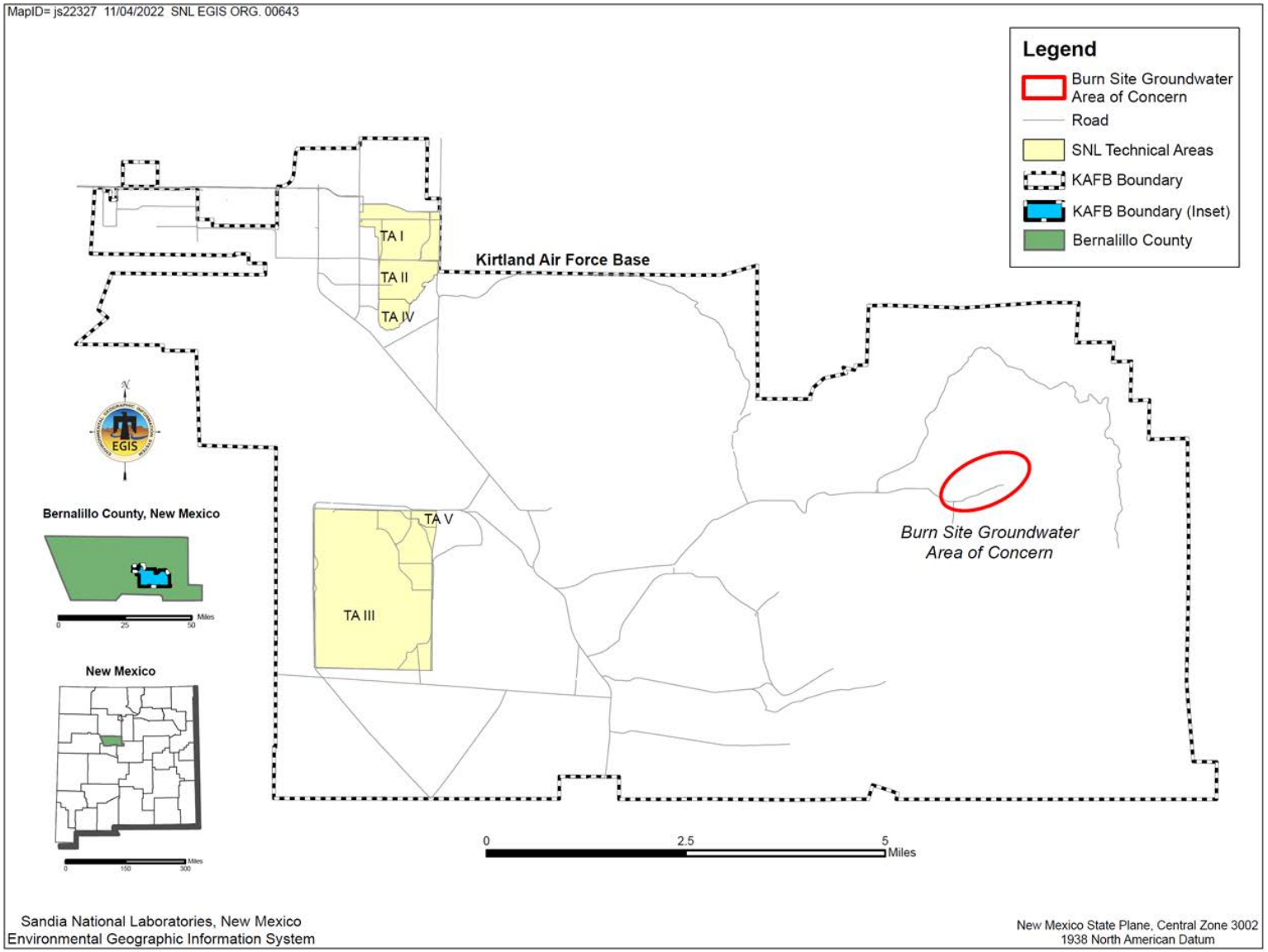


Figure 7-1
Location of the Burn Site Groundwater Area of Concern

7.1.3 Monitoring History

BSG AOC groundwater monitoring began in 1996. Groundwater samples collected in 1996 from the Burn Site Well (a non-potable production well used for fire suppression) contained elevated nitrate concentrations (maximum of 27 mg/L in August 1996). In 1997, New Mexico Environment Department (NMED), U.S. Department of Energy National Nuclear Security Administration (DOE/NNSA), and Sandia National Laboratories, New Mexico (SNL/NM) personnel agreed to investigate the source of this contamination. Later in 1997, monitoring wells CYN-MW1D and CYN-MW2S were installed downgradient of the Burn Site Well (Table 7-1). Samples from CYN-MW1D contained elevated nitrate concentrations. Two more monitoring wells, CYN-MW3 and CYN-MW4, were installed in 1999 to further characterize the study area. Based on regulatory requirements, monitoring wells CYN-MW6, CYN-MW7, and CYN-MW8 were installed from 2005 through 2006. Figure 7-2 shows the current BSG AOC monitoring well network.

Previous monitoring reports include analytical results for monitoring well CYN-MW5, which is located approximately 1.7 mi west of the BSG AOC. CYN-MW5 was installed at SWMU 49 in 2001 as part of the investigation of drain and septic system sites. CYN-MW5 was sampled for eight quarters as part of the drain and septic system investigation and was incorporated into the BSG AOC investigation as a downgradient well. However, in a February 2005 letter, the NMED stated that it would not consider CYN-MW5 a downgradient well because it was located over 2 mi from the Burn Site (NMED, February 2005). Based on the NMED determination, CYN-MW5 has not been sampled as part of the BSG AOC investigation since the third quarter of fiscal year 2005. CYN-MW5 was added to the Groundwater Monitoring Program annual sampling event in CY 2019, and current monitoring data from this well is discussed in Chapter 2.0.

Since the initial discovery of nitrate at the BSG AOC, numerous characterization activities have been performed. These activities are summarized in a timeline (Attachment 7A, Table 7A-1). The results of earlier characterization activities are summarized in the *Current Conceptual Model of Groundwater Flow and Contaminant Transport at Sandia National Laboratories/New Mexico Burn Site* (SNL/NM, June 2004a) and subsequent update (SNL/NM, April 2008a).

In April 2004, the *Compliance Order on Consent Pursuant to the New Mexico Hazardous Waste Act 74-4-10: Sandia National Laboratories Consent Order* (Consent Order) (NMED, April 2004) took effect and identified the Burn Site as an area of groundwater contamination. In response to the Consent Order, DOE/NNSA and SNL/NM personnel submitted the *Corrective Measures Evaluation Work Plan for Sandia National Laboratories/New Mexico Burn Site* (June 2004 CME Work Plan) (SNL/NM, June 2004b) and the *Interim Measures Work Plan, Burn Site Groundwater* (IMWP) (SNL/NM, May 2005) to the NMED in June 2004 and May 2005, respectively. As required by the IMWP, three monitoring wells (CYN-MW6, CYN-MW7, and CYN-MW8) were installed near the Burn Site in December 2005 and January 2006. Quarterly sampling of these three monitoring wells for eight quarters began in March 2006 and was completed in December 2007. Groundwater samples from the two monitoring wells (CYN-MW7 and CYN-MW8) located downgradient of monitoring well CYN-MW1D were analyzed for nitrate and other analytes. Groundwater samples from CYN-MW6 (adjacent to SWMU 94F) were analyzed for nitrate, total petroleum hydrocarbons as gasoline range organics (GRO) and diesel range organics (DRO), and other analytes.

Table 7-1
Groundwater Monitoring Wells in the Burn Site Groundwater Area of Concern

Well ID	Installation Year	WQ	WL	Comments
12AUP01	1996	NA	NA	Alluvial-underflow monitoring well, P&A in November 2012
Burn Site Well	1986	NA	✓	Non-potable bedrock production well, inactive since 2003
CYN-MW1D	1997	NA	NA	Bedrock groundwater well, P&A in November 2012
CYN-MW2S	1997	NA	NA	Alluvial-underflow monitoring well, P&A in November 2012
CYN-MW3	1999	NA	✓	Bedrock groundwater well, dry since 2019
CYN-MW4	1999	✓	✓	Bedrock groundwater well
CYN-MW6	2005	NA	✓	Bedrock groundwater well, did not produce adequate volume for sample collection
CYN-MW7	2005	✓	✓	Bedrock groundwater well
CYN-MW8	2006	✓	✓	Bedrock groundwater well
CYN-MW9	2010	✓	✓	Bedrock groundwater well
CYN-MW10	2010	✓	✓	Bedrock groundwater well
CYN-MW11	2010	✓	✓	Bedrock groundwater well
CYN-MW12	2010	✓	✓	Bedrock groundwater well
CYN-MW13	2012	✓	✓	Bedrock groundwater well, replaced CYN-MW1D
CYN-MW14A	2014	✓	✓	Bedrock groundwater well
CYN-MW15	2014	NA	✓	Bedrock groundwater well, replaced CYN-MW6, did not produce adequate volume for sample collection
CYN-MW16	2019	✓	✓	Bedrock groundwater well
CYN-MW17	2019	✓	✓	Bedrock groundwater well
CYN-MW18	2019	✓	✓	Bedrock groundwater well
CYN-MW19	2019	✓	✓	Bedrock groundwater well
Total	----	13	17	Total for AGMR reporting

Notes:
Check marks (✓) in the WQ and WL columns indicate that samples and measurements were obtained in CY 2024.
Water level checks in CYN-MW3 confirm that the groundwater elevation is below the bottom of the screen (dry).
AGMR = annual groundwater monitoring report
CYN = Canyons
ID = identifier
MW = Monitoring Well
NA = not applicable
P&A = plugged and abandoned (decommissioned)
WL = water level
WQ = water quality

Based on a letter from the NMED (NMED, April 2009), DOE/NNSA and SNL/NM personnel were required to further characterize the nature and extent of the perchlorate contamination at the BSG AOC and therefore submitted the *Burn Site Groundwater Characterization Work Plan, Installation of Groundwater Monitoring Wells CYN-MW9, CYN-MW10, and CYN-MW11, Collection of Subsurface Soil Samples* (BSG Characterization Work Plan) to the NMED in November 2009 (SNL/NM, November 2009). The NMED conditionally approved the BSG Characterization Work Plan in February 2010 (NMED, February 2010). The work plan was implemented in July 2010 and four monitoring wells (CYN-MW9, CYN-MW10, CYN-MW11, and CYN-MW12) were installed to determine the extent of groundwater contamination. These four monitoring wells were sampled for the first time in September 2010.

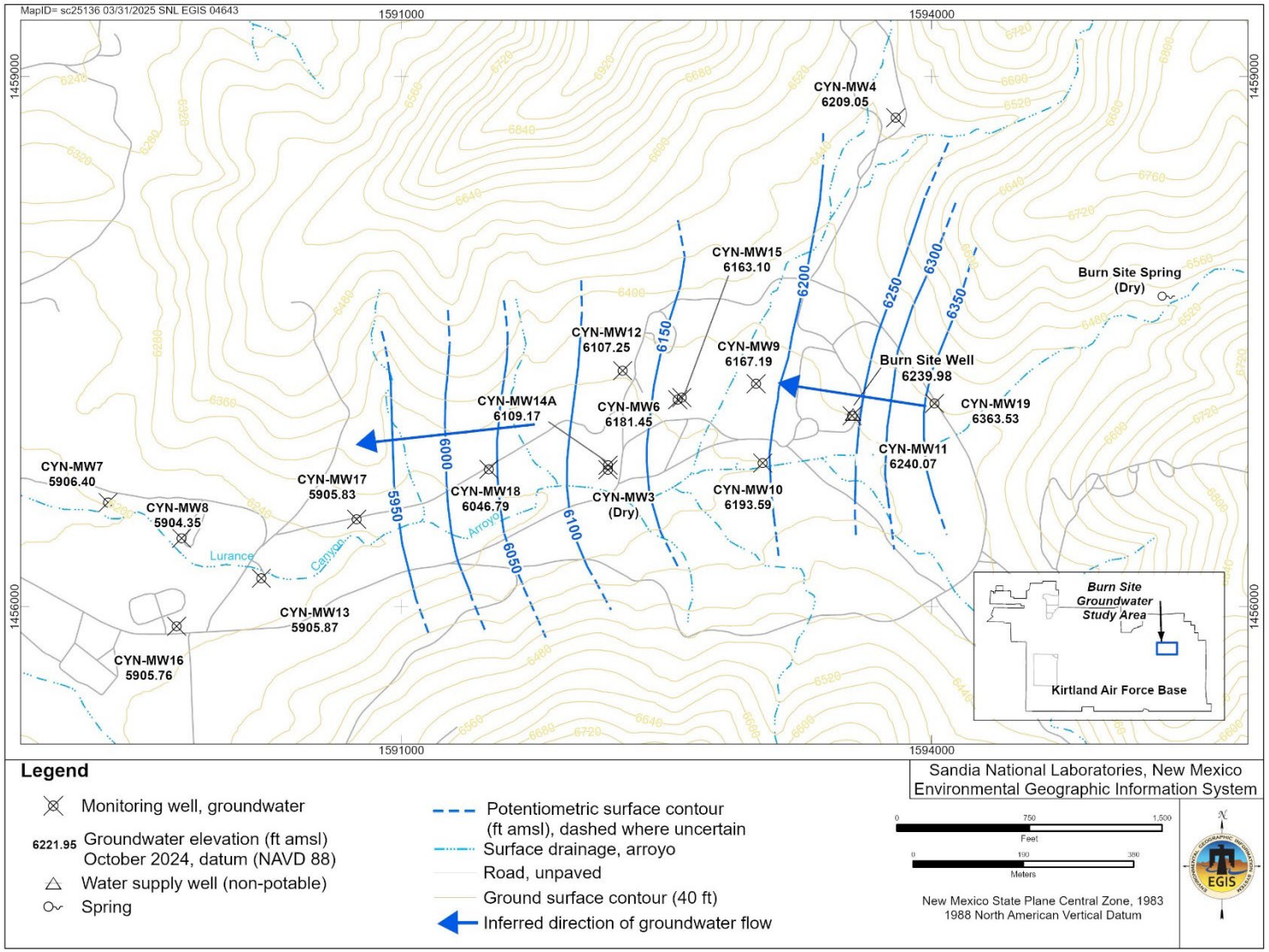


Figure 7-2
Localized Potentiometric Surface of the Burn Site Groundwater Area of Concern (October 2024)

In February 2012, DOE/NNSA and SNL/NM personnel submitted a work plan to decommission three obsolete monitoring wells (12AUP01, CYN-MW1D, and CYN-MW2S) and install a replacement monitoring well (CYN-MW13) (SNL/NM, February 2012). 12AUP01 and CYN-MW2S were screened at the contact of unconsolidated coarse sand and gravel (alluvium) and underlying bedrock. Although alluvium at this contact was dry during drilling, these monitoring wells were installed in anticipation of recharge occurring after rainfall events; however, they were consistently dry. CYN-MW1D was constructed with a nonstandard completion (low carbon steel screen and riser pipe), had very turbid water, and exhibited inconsistent and potentially anomalous nitrate concentrations. A video log showed that it was heavily corroded. The NMED approved the work plan in April 2012 (NMED, April 2012). The three obsolete monitoring wells (12AUP01, CYN-MW1D, and CYN-MW2S) were decommissioned in November 2012, and the replacement monitoring well (CYN-MW13) was installed in December 2012 near CYN-MW1D.

In August 2013, DOE/NNSA and SNL/NM personnel submitted an extension request to the NMED for the BSG Corrective Measures Evaluation (CME), which was due at the NMED by March 31, 2014 (DOE, August 2013). DOE/NNSA and SNL/NM personnel requested the extension to consider recently collected groundwater sample analytical results from replacement monitoring well CYN-MW13 that could impact the CME.

In October 2013, the DOE Office of Environmental Management submitted the *Internal Remedy Review of the Burn Site Groundwater Area of Concern, Sandia National Laboratories, Albuquerque, New Mexico* (Internal Remedy Review) memorandum to the DOE/NNSA Sandia Field Office (DOE, October 2013). This memorandum stated that additional characterization activities should be conducted at the BSG AOC before the CME was prepared. The Internal Remedy Review recommended a weight-of-evidence approach to determine the source(s) of nitrate contamination.

In September 2013, DOE/NNSA and SNL/NM personnel submitted a work plan to install two monitoring wells (SNL/NM, September 2013a). The NMED approved the work plan in June 2014 (NMED, June 2014a). The work plan discussed the need to install two replacement monitoring wells (CYN-MW14 and CYN-MW15) because of declining water levels at the Burn Site. CYN-MW14 was planned to replace CYN-MW3, whereas CYN-MW15 was planned to replace CYN-MW6. In December 2014, CYN-MW14A (note the 'A' suffix, as multiple boreholes were needed to complete this monitoring well) and CYN-MW15 were installed (SNL/NM, April 2015). The installation of a direct replacement for CYN-MW3 was not possible because the shallow water-bearing fracture zone was not encountered by either of the two nearby boreholes. A deeper-than-planned monitoring well, CYN-MW14A, was installed near CYN-MW3. CYN-MW15 was installed as planned (at a similar water-bearing fracture depth) near CYN-MW6.

In January 2019, DOE/NNSA and SNL/NM personnel submitted a work plan to install up to eight monitoring wells (SNL/NM, January 2019). The NMED approved the work plan in February 2019 (NMED, February 2019). Based on NMED requirements (NMED, June 2018), the work plan discussed the need to install four monitoring wells (CYN-MW16, CYN-MW17, CYN-MW18, and CYN-MW19) to help define the extent of nitrate concentrations in the groundwater and refine the potentiometric surface. Specifically, these monitoring wells were required to define the upgradient and downgradient extent of the nitrate plume and provide information on the 2,000-ft data gap between existing monitoring wells CYN-MW3 and CYN-MW13. CYN-MW16, CYN-MW17, CYN-MW18, and CYN-MW19 were installed in CY 2019. The potential installation of up to four additional monitoring wells (SNL/NM, January 2019) was evaluated after the July 2021 sampling event when eight quarters of water level and validated analytical sample data were available. DOE/NNSA and SNL/NM personnel proposed to the NMED that the existing BSG AOC monitoring well network was sufficient to characterize the extent of nitrate contamination (DOE, November 2021), and the NMED agreed that the four additional monitoring wells were not required (NMED, December 2021).

7.1.4 Current Monitoring Well Network

Figure 7-2 shows the current BSG AOC monitoring well network. It consists of a non-potable production well (Burn Site Well) and 16 monitoring wells used to monitor water levels and water quality. The monitoring wells are CYN-MW3, CYN-MW4, CYN-MW6, CYN-MW7, CYN-MW8, CYN-MW9, CYN-MW10, CYN-MW11, CYN-MW12, CYN-MW13, CYN-MW14A, CYN-MW15, CYN-MW16, CYN-MW17, CYN-MW18, and CYN-MW19. During the CY 2024 sampling events, CYN-MW3 was dry and CYN-MW6 and CYN-MW15 had minimal water in the screened interval and did not produce sufficient volume for sample collection.

7.1.5 Conceptual Site Model

The following sections summarize the Conceptual Site Model for the BSG AOC. Groundwater flow in the BSG AOC is controlled by the local geologic framework and structural features described below and shown schematically on Figure 7-3.

7.1.5.1 Regional Hydrogeologic Conditions

The Manzanita Mountains are composed of a complex sequence of uplifted Precambrian metamorphic and granitic units that were subjected to several episodes of significant deformation. These units are capped by Paleozoic sandstones, shales, and limestones of the Sandia, Gray Mesa, and Atrasado Formations (the Gray Mesa and Atrasado Formations are part of the Madera Group) (Kues, 2001). The geologic history of the Manzanita Mountains is thoroughly described in *Groundwater Investigation, Canyons Test Area, Operable Unit 1333, Burn Site, Lurance Canyon* (SNL/NM, November 2001) and utilizes the model presented by Brown et al. (1999). The local geology is also summarized in the *Current Conceptual Model of Groundwater Flow and Contaminant Transport at Sandia National Laboratories/New Mexico Burn Site* (SNL/NM, April 2008a) and *Burn Site Groundwater Area of Concern Current Conceptual Model and Corrective Measures Evaluation Report* (BSG CCM/CME Report) (SNL/NM, January 2023).

Groundwater in the Manzanita Mountains predominantly occurs in fractured metamorphic and intrusive units that consist of metavolcanics, quartzite, metasediments (schists and phyllites), and the Manzanita Granite. The groundwater migrates through bedrock fractures in a generally westward direction. The only intermittent spring in the immediate area, the Burn Site Spring (Figure 7-2), is located upgradient and upslope of the testing facilities at a limestone outcrop. No flow has been observed at this spring since 2007.

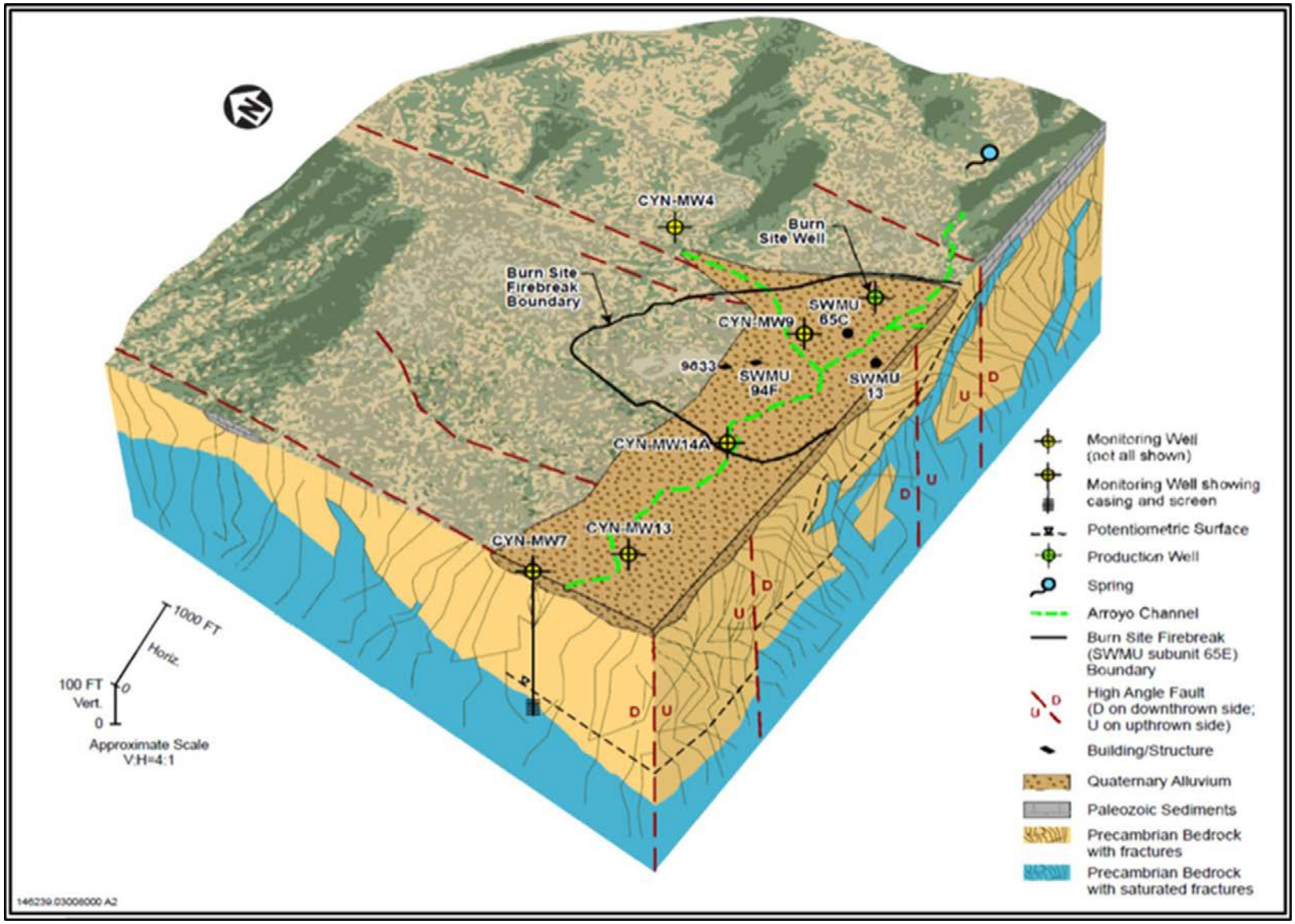


Figure 7-3
Conceptual Site Model for the Burn Site Groundwater Area of Concern

The matrix permeability of the fractured bedrock units is low, and most groundwater is produced from discontinuous water-bearing fracture zones. The groundwater discharges to small ephemeral springs located at the base of the Manzanita Mountains, approximately 3 mi west of the Burn Site. The groundwater from these springs at the base of the Manzanita Mountains is of a different geochemical character than that in the BSG AOC. Additionally, some groundwater may discharge as underflow to the Regional Aquifer in unconsolidated sedimentary deposits of the Albuquerque Basin after crossing the Tijeras Fault Zone.

The Precambrian metamorphic rocks (predominantly schists and phyllite) and the Precambrian intrusive rocks (predominantly granitic gneiss) are typically fractured as a result of the long and complex history of regional deformation. Drill core data, borehole video logging, and outcrop exposures indicate that some fractures in shallow bedrock are filled with chemical precipitates, such as calcium carbonate. The carbonate precipitation likely occurred when the water table was regionally elevated prior to the development of the Rio Grande. As chemical precipitates filled the fractures, permeability was effectively reduced, possibly creating a semiconfined unit above underlying bedrock with open fractures.

The Burn Site is bisected by a north-south trending fault system consisting locally of several high-angle normal and reverse faults that are mostly downfaulted to the east (Karlstrom et al., 2000). Faults (where exposed) are characterized by zones of crushing and brecciation. The Burn Site Fault trends north to south in the vicinity of the Burn Site Well and monitoring well CYN-MW4. Nearby outcrops indicate that the fault displacement is approximately 160 ft (SNL/NM, June 2004a). Based on water levels measured at the monitoring wells installed in 2019, current interpretations suggest that faults between monitoring wells CYN-MW17 and CYN-MW18 significantly control the potentiometric surface.

The BSG AOC canyon floor consists of unconsolidated deposits over bedrock. These deposits are typically sand and gravel derived from erosion of upslope colluvium and bedrock or aeolian deposits derived from the basin to the west. They range in thickness from 21 to 55 ft in boreholes drilled at the BSG AOC and pinch out against nearby bedrock outcrops along the steep canyon slopes.

7.1.5.2 Hydrogeologic Conditions at the Burn Site Groundwater Area of Concern

When the Burn Site Well was installed in 1986, the depth to the groundwater-bearing fracture zone was approximately 222 ft bgs. Following completion of the well in fractured bedrock, the water level rose approximately 154 ft above the fracture zone due to an upward hydraulic gradient. The fractured rocks of the Manzanita Mountains are recharged by infiltration of precipitation, largely resulting from summer thundershowers and, to a lesser degree, winter snowfall at the higher elevations. Groundwater recharge is restricted by high evapotranspiration rates (losses to the atmosphere by evaporation and plant transpiration), the low permeability of the bedrock matrix, and the discontinuous nature of the bedrock fractures.

Regionally, groundwater in the western Manzanita Mountains generally flows toward the west from a groundwater flow divide located east of the BSG AOC. Groundwater flow along Lurance Canyon discharges primarily as direct underflow to the unconsolidated basin fill deposits of the Albuquerque Basin. Based on field observations, some discharge also occurs at ephemeral and perennial springs along the mountain front. Much of the flow that discharges from these springs undergoes evapotranspiration. Some flow from the springs infiltrates nearby alluvial deposits.

Most precipitation falls between July and September, mainly in the form of brief heavy rain. The average annual precipitation in this drainage basin is estimated to range between 12 and 16 in. (SNL/NM, April 2008a). In 2019, a meteorological observation tower (LC1) was installed in Lurance Canyon west of the Burn Site (Chapter 1.0, Figure 1-4). A total of 10.32 in. of precipitation was measured at LC1 in CY 2024 (Chapter 2.0, Table 2-3). July, August, and November were the wettest months at this meteorological observation tower (Chapter 2.0, Attachment 2B, Figure 2B-11). There are no annual precipitation data for LC1 from years prior to 2020, but 10 years of data from other meteorological

observation towers in the vicinity show that CY 2024 was a drier year than normal (Chapter 2.0, Section 2.6.2.1). Potential evapotranspiration in the Albuquerque area greatly exceeds precipitation. Because much of the rainfall in the Lurance Canyon drainage occurs during the summer, losses to evapotranspiration are high. A small percentage of precipitation may infiltrate into the exposed bedrock or into alluvial deposits along the canyon floor.

Ephemeral surface water flow occurs in response to precipitation in the drainage basin. In 1997, two shallow monitoring wells (CYN-MW2S and 12AUP01) were constructed in Lurance Canyon to monitor groundwater potentially occurring within the channel deposits at the contact with underlying Precambrian bedrock. No groundwater was present in either shallow monitoring well until September 2, 2004. After a series of rain events, 1-2 in. of water were measured in 12AUP01. The water level remained constant for about one month. However, no water has been measured in 12AUP01 since 2005 and no groundwater has ever been measured in CYN-MW2S. Both monitoring wells were plugged and abandoned in 2012 (SNL/NM, March 2013). It is likely that saturation in the alluvium only occurs after a series of heavy rain events. Episodic accumulation of precipitation may provide a mechanism for recharging the brecciated fault zones and non-cemented fractures in the underlying bedrock.

7.1.5.3 Local Direction of Groundwater Flow

Figure 7-2 presents the October 2024 potentiometric surface map of the BSG AOC and Table 7-2 presents the groundwater elevation data used to construct the map. The general direction of groundwater flow in the BSG AOC is to the west, as inferred from the orientation of the potentiometric surface. With the addition of the four newest monitoring wells at the Burn Site, a more detailed interpretation of the potentiometric surface for the fractured bedrock aquifer system was possible. The interpretation of the potentiometric surface in the western part of the BSG AOC changed significantly between CY 2018 and CY 2019 based on the data from the newly installed monitoring wells. Most notably, a new interpretation of the potentiometric surface contour shifted the 6,000-ft contour eastward approximately 400 ft.

The CY 2024 potentiometric surface (Figure 7-2) depicts a steep groundwater gradient from easternmost monitoring well CYN-MW19 to monitoring well CYN-MW17 in the west, with nearly 457 ft of groundwater elevation difference over approximately 3,200 ft (0.6 mi), a gradient of 0.14. In contrast, the five westernmost monitoring wells (CYN-MW7, CYN-MW8, CYN-MW13, CYN-MW16, and CYN-MW17) spread along a down-canyon distance of approximately 1,200 ft have groundwater elevations within a narrow range of approximately 2 ft, essentially a zero gradient. The gradient between CYN-MW17 and CYN-MW7 has less than 1 ft of groundwater elevation difference over 1,400 ft (0.27 mi), and although it is located further west (presumably the downgradient direction), the groundwater elevation at CYN-MW7 is slightly higher than that at CYN-MW17. Of the five western monitoring wells, CYN-MW8 has the lowest groundwater elevation and is therefore the most downgradient well in the BSG AOC.

Table 7-2
Groundwater Elevation Data for Burn Site Groundwater Area of Concern Monitoring Wells Completed in the Fractured Bedrock Aquifer System, October 2024

Well ID	Measuring Point (ft amsl) NAVD 88	Date Measured	Depth to Water (ft btoc)	Water Elevation (ft amsl)
Burn Site Well	6374.66	01-Oct-2024	134.68	6239.98
CYN-MW3	6313.26	01-Oct-2024	--	--
CYN-MW4	6455.48	01-Oct-2024	246.43	6209.05
CYN-MW6	6343.37	01-Oct-2024	161.92	6181.45
CYN-MW7	6216.35	01-Oct-2024	309.95	5906.40
CYN-MW8	6230.11	01-Oct-2024	325.76	5904.35
CYN-MW9	6360.67	01-Oct-2024	193.48	6167.19
CYN-MW10	6345.45	01-Oct-2024	151.86	6193.59
CYN-MW11	6374.41	01-Oct-2024	134.34	6240.07
CYN-MW12	6345.16	01-Oct-2024	237.91	6107.25
CYN-MW13	6237.79	01-Oct-2024	331.92	5905.87
CYN-MW14A	6315.85	01-Oct-2024	206.68	6109.17
CYN-MW15	6344.44	01-Oct-2024	181.34	6163.10
CYN-MW16	6249.60	01-Oct-2024	343.84	5905.76
CYN-MW17	6268.95	01-Oct-2024	363.12	5905.83
CYN-MW18	6304.02	01-Oct-2024	257.23	6046.79
CYN-MW19	6410.43	01-Oct-2024	46.90	6363.53

Notes:
amsl = above mean sea level
btoc = below top of casing
CYN = Canyons
ft = feet
ID = identifier
MW = Monitoring Well
NAVD 88 = North American Vertical Datum of 1988
-- = No data, monitoring well dry during this measurement period

The flat gradient in the western part of the BSG AOC may be related to (or controlled by) several high-angle faults that offset Precambrian and Paleozoic bedrock in the area west of monitoring well CYN-MW18 (Karlstrom et al., 2000). Another explanation for the flat groundwater gradient is that the area is possibly influenced by localized groundwater flow emanating from Sol se Mete Canyon, a large surface drainage south of the BSG AOC that merges with Lurance Canyon just west of monitoring wells CYN-MW7 and CYN-MW16.

No production wells are located near the BSG AOC except the Burn Site Well, which was only rarely used for non-potable applications, such as fire suppression in testing structures and fuel pool tests. The Burn Site Well was last used in 2003. The submersible pump was removed from the well in December 2014 and has not been reinstalled. Water levels in the Paleozoic and Precambrian bedrock near the BSG AOC are not influenced by production well pumping of the basin fill deposits of the Albuquerque Basin (Regional Aquifer), which are located west of the Tijeras Fault Zone.

The variability of hydraulic gradients in Lurance Canyon indicates that localized controls are associated with brecciated fault zones in the low-permeability fractured bedrock at the BSG AOC. Limited groundwater flow velocity information is based on COC first arrival estimates. Based on petroleum fuel releases from SWMU 94F arriving at monitoring well CYN-MW1D, the minimum apparent velocity of the COCs was initially estimated to be approximately 160 ft/yr (SNL/NM, April 2008a). However, recent geochemical studies indicate that inferring such a groundwater velocity may not be valid because fracture connectivity may be limited. No information is available about vertical flow velocity within the fractured bedrock aquifer system at the BSG AOC. However, vertical movement of groundwater within the brecciated fault zones probably occurs as rapid, partially saturated to saturated flow.

Filled fractures within the upper portion of the metamorphic and intrusive rocks may act as a semiconfining unit restricting vertical flow. These concepts were corroborated by an aquifer pumping test conducted in March 2017. The test showed significant compartmentalization of groundwater into distinct hydraulic domains such that some portions of the fractured bedrock aquifer system are unconfined and respond to infiltration of precipitation, whereas other portions are semiconfined to confined. Some faults and fractures are sealed and act as barriers to groundwater flow (SNL/NM, December 2017).

Water levels at the Burn Site have been routinely monitored since 1999. The BSG AOC hydrographs (Attachment 7D, Figures 7D-1 through 7D-9) show the water levels for the monitoring wells completed in bedrock. There are no active production wells in the area or substantial seasonal variations in these water levels The wide range of hydraulic gradients in Lurance Canyon and the lack of correlation between water level fluctuations in these monitoring wells support the assessment that the BSG AOC low-permeability fractured bedrock aquifer system is poorly interconnected. Water level fluctuations may be the result of local heterogeneities in hydraulic properties related to the water-bearing fracture zones.

The five monitoring wells in the lower (western) part of the canyon (CYN-MW7, CYN-MW8, CYN-MW13, CYN-MW16, and CYN-MW17) have exhibited little variability over time, with a steady decline of approximately 0.75 ft/yr (Figure 7D-4). The monitoring wells in the upper part of the canyon, most notably CYN-MW6, CYN-MW9, CYN-MW10, CYN-MW11 (and Burn Site Well), and CYN-MW15, showed significant increases in water levels during a two-year interval starting in early 2014, apparently in response to intense thunderstorms in the 2014 and 2015 monsoon seasons. The water levels in these five monitoring wells rebounded by 14.79 to 19.65 ft between July 2014 and October 2015 (Figures 7D-3, 7D-6, and 7D-7). However, these five monitoring wells, and most of the remaining monitoring wells, currently show declining groundwater elevations of 3 or more ft/yr (Figures 7D-1 through 7D-3, 7D-6 through 7D-8).

7.1.5.4 Contaminant Sources

The nitrate in the BSG AOC may be derived from both natural and anthropogenic sources. The NMED-specified background concentration for nitrate in groundwater is 4 mg/L (NMED, September 1997). This value is based on an NMED study (NMED, January 1995). However, that study concluded that the background concentration was not reliably established due to the lack of suitable (convincingly uncontaminated) wells available at that time. Potential natural sources include weathering of rocks, atmospheric deposition, and grading of soils and alluvium. Evaporation and transpiration of rainwater that has infiltrated canyon alluvial sediments might have increased nitrate concentrations. Potential anthropogenic nitrate sources include the use of ammonium-nitrate slurry, wastewater discharges, and the degradation of HE compounds. SNL/NM personnel have conducted several soil sampling events at the BSG AOC to identify the nitrate source; however, no conclusive source has been identified, most likely because chemical releases ceased decades ago and precipitation has leached the nitrate from the soil.

Evidence indicates that evaporation and transpiration may concentrate nitrate in sediments beneath ephemeral drainages in the vicinity of the Manzanita Mountains. This evidence includes nitrate concentrations that exceed the EPA MCL in the groundwater beneath these drainages and a chloride-to-nitrate ratio in the groundwater that is similar to that of rainfall (McQuillan and Space, 1995). In more recent studies, the United States Geological Survey has attributed naturally occurring accumulations of geologic nitrate in unconsolidated sediments along Tijeras Arroyo to a similar evaporation and transpiration mechanism (Chapter 6.0).

SWMU 65 is located in the center of the BSG AOC and contained open-air detonation areas where nitrate-based explosives were used. The detonations dispersed explosive compounds across the ground surface, and subsequent degradation (weathering) of these explosive compounds most likely released some nitrate. Testing at SWMU 94 also involved burn tests involving large volumes of ammonium-nitrate slurry, HE compounds (both nitrate-based and plastic explosives), and rocket propellants. Nitrate is highly soluble in water and precipitation can enhance its migration to groundwater. In addition to nitrate, petroleum fuel products were detected in soil samples and potential impacts to groundwater were evaluated.

7.1.5.5 Contaminant Distribution and Transport in Groundwater

In October 1991, nitrate concentrations above the EPA MCL of 10 mg/L were first detected in groundwater samples collected from the Burn Site Well. Since the installation of the monitoring wells listed in Table 7-3, nitrate concentrations above the EPA MCL have consistently been detected in groundwater samples. Nitrate concentrations in groundwater samples collected from monitoring wells CYN-MW4, CYN-MW7, CYN-MW8, CYN-MW17, CYN-MW18, and CYN-MW19 have not exceeded the EPA MCL and are not included in Table 7-3.

Potential downgradient receptors of the nitrate plume are Coyote Springs, approximately 3 mi west of the BSG AOC, and the Albuquerque Bernalillo County Water Utility Authority (ABCWUA) and KAFB well fields, located approximately 7 to 12 mi west-northwest of the BSG AOC. Numerical simulations predict that the nitrate concentrations will decrease to below the EPA MCL at the Coyote Springs ecological receptor, and to below the method detection limits (MDLs) in the Regional Aquifer, through dispersion and dilution as the nitrate-impacted groundwater moves into the more hydraulically conductive alluvial-fan and ancestral Rio Grande deposits west of Coyote Springs. Numerical simulations also predict that groundwater travel times from the BSG AOC to the ABCWUA and KAFB well fields will exceed 600 years (SNL/NM, May 2005).

Table 7-3
Summary of Historical Nitrate Concentration Exceedances of the EPA MCL[a] at Burn Site Groundwater Area of Concern Monitoring Wells

Well ID	Historical Maximum NPN Concentration (mg/L)	Approximate Distance and Direction from Burn Site Well
Burn Site Well	27.0	Not applicable
CYN-MW1D	28.0	3,400 ft west-southwest
CYN-MW3	14.7	1,400 ft west
CYN-MW6	39.9	1,000 ft west
CYN-MW9	49.6	600 ft west-northwest
CYN-MW10	25.8	600 ft west-southwest
CYN-MW11	25.4	10 ft south
CYN-MW12	22.6	1,300 ft west-northwest
CYN-MW13	40.0	3,400 ft west-southwest
CYN-MW14A	15.7	1,400 ft west
CYN-MW15	29.8	1,000 ft west
CYN-MW16	11.7	4,000 ft west-southwest

Notes:
[a]EPA MCL for nitrate is 10 mg/L.
CYN = Canyons
EPA = U.S. Environmental Protection Agency
ft = feet
ID = identifier
MCL = maximum contaminant level
mg/L = milligrams per liter
MW = Monitoring Well
NPN = nitrate plus nitrite

7.2 Regulatory Requirements

BSG AOC groundwater monitoring is subject to the Consent Order and the comprehensive site-wide groundwater monitoring plan submitted to the NMED annually.

The NMED Hazardous Waste Bureau provides regulatory oversight of SNL/NM Environmental Restoration Operations and enforces regulations mandated by the Resource Conservation and Recovery Act. All SWMUs and AOCs at SNL/NM are listed in the *Resource Conservation and Recovery Act Facility Operating Permit for Sandia National Laboratories, EPA ID No. NM5890110518* (RCRA Permit) (NMED, January 2015, as modified).

The BSG AOC groundwater monitoring activities are not associated with a single SWMU but rather are more regional in nature. Initially, Burn Site groundwater monitoring was initiated to meet the RCRA Permit requirements to characterize numerous SWMUs located at the Lurance Canyon Burn Site Testing Facility. Before the Consent Order took effect, Burn Site groundwater investigations were conducted voluntarily by SNL/NM personnel. When the Consent Order took effect in April 2004, regulatory authority for corrective action requirements was transferred from the RCRA Permit to the Consent Order. The Consent order defines all BSG AOC corrective action requirements.

In November 2021, DOE/NNSA and SNL/NM personnel proposed to the NMED that the existing BSG AOC monitoring well network was sufficient to characterize the extent of nitrate contamination (DOE, November 2021) and the NMED agreed (NMED, December 2021). This decision allowed DOE/NNSA and SNL/NM personnel to prepare and submit the BSG CCM/CME Report.

On February 15, 2024, the NMED issued a public notice announcing a 60-day public comment period for the selected remedy for the BSG AOC. The NMED provided a fact sheet and statement of basis to the public and stakeholders for their review and comments (NMED, February 2024). The public comment period ended on April 15, 2024 with no comments received. The NMED subsequently selected long-term monitoring as the final remedy for the BSG AOC on May 6, 2024 (NMED, May 2024). Thereafter, DOE/NNSA and SNL/NM personnel submitted the *Burn Site Groundwater Corrective Measures Implementation Plan* (BSG CMI Plan) (SNL/NM, December 2024) to the NMED.

7.3 Scope of Activities

CY 2024 BSG AOC groundwater monitoring activities included:

- Quarterly water level measurements at 16 BSG AOC monitoring wells and the Burn Site Well.
- Semiannual collection and analysis of groundwater samples from 13 BSG AOC monitoring wells (CYN-MW4, CYN-MW7, CYN-MW8, CYN-MW9, CYN-MW10, CYN-MW11, CYN-MW12, CYN-MW13, CYN-MW14A, CYN-MW16, CYN-MW17, CYN-MW18, and CYN-MW19) in May/June and October/November 2024.
- Submittal of the BSG CMI Plan to the NMED.
- Submittal of the *Comprehensive Site-Wide Groundwater Monitoring Plan, Calendar Year 2025* (SNL/NM, April 2024) to the NMED.
- Preparation of analytical results tables (Attachment 7B), concentration trend plots (Attachment 7C), and hydrographs (Attachment 7D).

Table 7-4 summarizes both sampling events; Table 7-5 lists the analytes for each monitoring well for each sampling event. In accordance with the NMED-approved *Comprehensive Site-Wide Groundwater Monitoring Plan (Revised), Calendar Year 2024* (CY 2024 Comprehensive Site-Wide Plan) (SNL/NM, April 2023; NMED, October 2023), environmental samples were analyzed semiannually and waste characterization samples were analyzed annually.

Table 7-4
Burn Site Groundwater Area of Concern Monitoring Well Network and Sampling Dates, Calendar Year 2024

Date of Sampling Event	Wells Sampled	Monitoring Plan
May/June 2024	CYN-MW4, CYN-MW7, CYN-MW8, CYN-MW9, CYN-MW10, CYN-MW11, CYN-MW12, CYN-MW13, CYN-MW14A, CYN-MW16, CYN-MW17, CYN-MW18, CYN-MW19	CY 2024 Comprehensive Site-Wide Plan (SNL/NM, April 2023)
October/November 2024	CYN-MW4, CYN-MW7, CYN-MW8, CYN-MW9, CYN-MW10, CYN-MW11, CYN-MW12, CYN-MW13, CYN-MW14A, CYN-MW16, CYN-MW17, CYN-MW18, CYN-MW19	CY 2024 Comprehensive Site-Wide Plan (SNL/NM, April 2023)

Notes:
CYN = Canyons
MW = Monitoring Well
SNL/NM = Sandia National Laboratories, New Mexico

Table 7-5
Analytes for Burn Site Groundwater Area of Concern Monitoring Wells, Calendar Year 2024

Analytes	May/June 2024	
Alkalinity[a] Major Anions (Bromide, Chloride, Fluoride, Sulfate)[a] DRO Gamma Spectroscopy (short list[b])[a] GRO Gross Alpha/Beta Activity[a] HE Compounds[a] Isotopic Uranium[a] NPN TAL Metals[a] Tritium[a] VOCs[a]	CYN-MW4 CYN-MW7 CYN-MW8 CYN-MW8 (Duplicate) CYN-MW9 CYN-MW10 CYN-MW11 CYN-MW12	CYN-MW13 CYN-MW14A CYN-MW14A (Duplicate) CYN-MW16 CYN-MW17 CYN-MW17 (Duplicate) CYN-MW18 CYN-MW19
Analytes	**October/November 2024**	
DRO GRO NPN	CYN-MW4 CYN-MW4 (Duplicate) CYN-MW7 CYN-MW8 CYN-MW9 CYN-MW10 CYN-MW10 (Duplicate) CYN-MW11 CYN-MW12	CYN-MW12 (Duplicate) CYN-MW13 CYN-MW14A CYN-MW16 CYN-MW17 CYN-MW18 CYN-MW19 CYN-MW19 (Duplicate)

Notes:
[a]Analyses performed for waste characterization purposes.
[b]Gamma spectroscopy short list includes americium-241, cesium-137, cobalt-60, and potassium-40.
CYN = Canyons
DRO = diesel range organics
GRO = gasoline range organics
HE = high explosive
MW = Monitoring Well
NPN = nitrate plus nitrite
TAL = Target Analyte List
VOC = volatile organic compound

7.4 Field Procedures and Measurements

Chapter 1.0, Section 1.3 describes how the CY 2024 BSG AOC groundwater data were collected and analyzed.

7.5 Analytical Methods

The analytical laboratory analyzed the groundwater samples using the applicable EPA and DOE-specified methods and protocols identified in Chapter 1.0, Section 1.3.2 (Tables 1-5 and 1-6).

Nitrate concentrations were measured by a nitrate plus nitrite (NPN) as nitrogen analytical method. Historical BSG AOC groundwater analyses have demonstrated that nitrite concentrations do not contribute to the results of NPN analyses. Therefore, NPN results in this chapter and its attachments represent nitrate concentrations, which are also referred to as NPN concentrations.

7.6 Summary of Calendar Year 2024 Groundwater Monitoring Results

The following sections summarize the CY 2024 BSG AOC groundwater monitoring results. Attachment 7B (Tables 7B-1 through 7B-9) presents the analytical results and field water quality parameter measurements for both sampling events. The analytical results were reviewed and qualified during data validation and include the laboratory and validation qualifiers. Attachment 7C (Figures 7C-1 through 7C-5) presents concentration trend plots for the monitoring wells where NPN exceeded the EPA MCL. Attachment 7D (Figures 7D-1 through 7D-9) presents the BSG AOC hydrographs.

The analytical results are compared to the EPA MCLs, where established. The analytical results and analytical laboratory data packages (Data Package 6) were submitted to the SNL/NM Customer Funded Records Center for retention.

7.6.1 Analytical Results for Environmental Samples

The environmental samples (Table 7-5) were analyzed for NPN, DRO, and GRO.

Table 7B-1 presents the NPN results. Figure 7-4 presents the NPN concentration contours for the October/November 2024 sampling event. NPN exceeded the EPA MCL of 10 mg/L in the environmental samples collected from five monitoring wells (CYN-MW9, CYN-MW10, CYN-MW12, CYN-MW13, and CYN-MW14A), with a maximum concentration of 34.0 mg/L in the October 2024 CYN-MW9 environmental sample. NPN was detected in the environmental samples collected from the other monitoring wells, but the concentrations were below the EPA MCL. The NPN concentrations in the environmental samples collected from the four newest monitoring wells significantly changed the interpretation of the contaminant distribution in the central and western part of the BSG AOC starting in CY 2019. As currently depicted for CY 2024 (Figure 7-4), there are two distinct plumes with elevated NPN concentrations; it is unknown if the plumes are derived from the same source. NPN concentrations below the EPA MCL in the environmental samples collected from monitoring wells CYN-MW17 and CYN-MW18 demonstrate that the plumes are not contiguous and that the areal extent of NPN concentrations above the EPA MCL is much less than previously thought. NPN concentrations are currently below the EPA MCL at new monitoring wells CYN-MW16 and CYN-MW19, which delineate the western and eastern extents of the plumes, respectively.

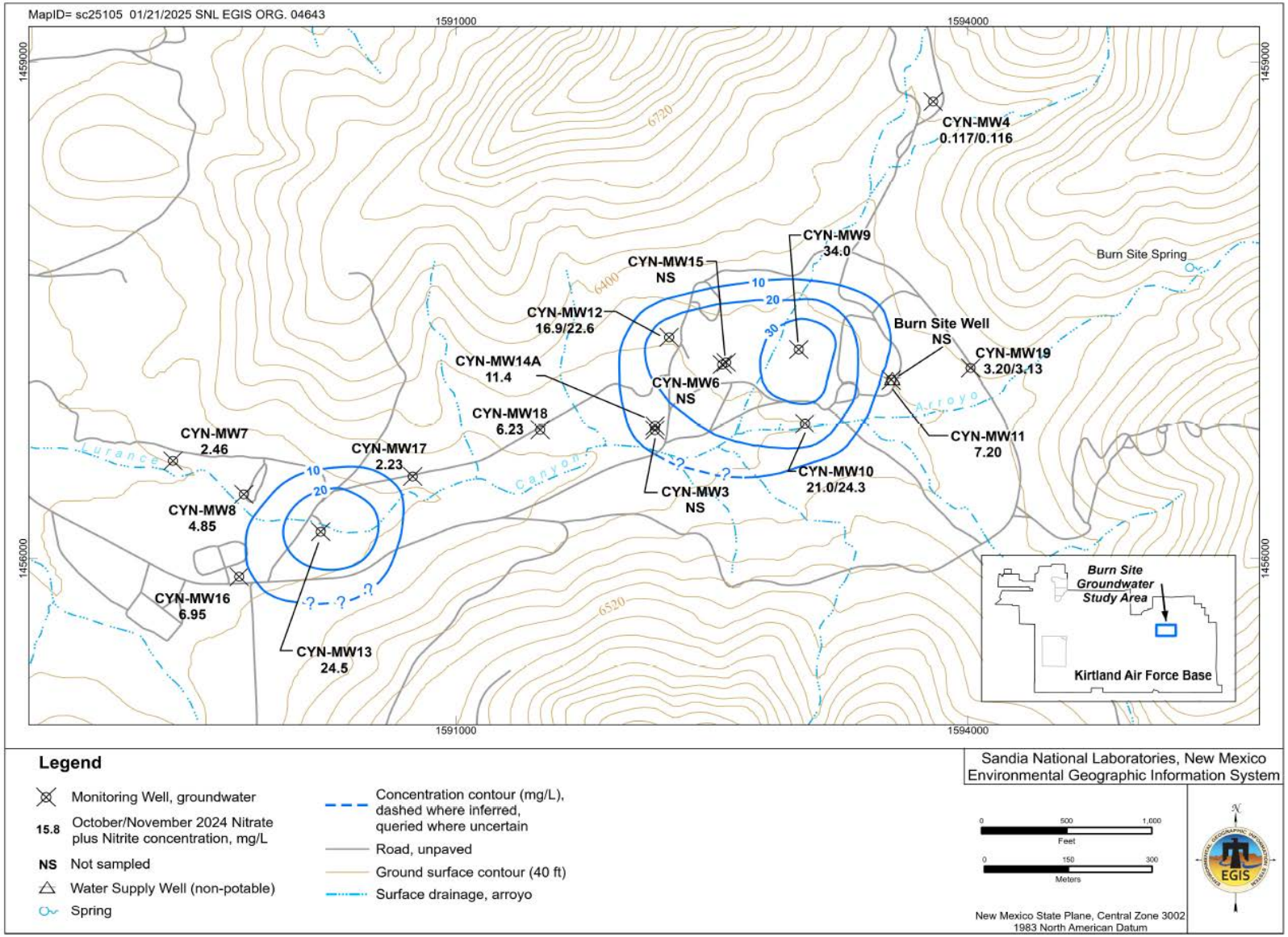


Figure 7-4
Nitrate Plus Nitrite Concentration Contour Map of the Burn Site Groundwater Area of Concern, October/November 2024

Figures 7C-1 through 7C-5 present the NPN concentration trend plots for the five monitoring wells. These plots show the following:

- CYN-MW9 (Figure 7C-1): The NPN concentrations were 33.5 mg/L (June 2024) and 34.0 mg/L (October 2024). The historical NPN concentrations for CYN-MW9 are all above the EPA MCL of 10 mg/L, and the range is approximately 29 to 50 mg/L, with an overall stable trend with high variability over the life of the well.
- CYN-MW10 (Figure 7C-2): The NPN concentrations were 23.9 mg/L (June 2024), 21.0 mg/L (October 2024), and 24.3 mg/L (October 2024, environmental duplicate sample). The historical range of NPN concentrations for CYN-MW10 is approximately 4 to 26 mg/L, with high variability over the life of the well.
- CYN-MW12 (Figure 7C-3): The NPN concentrations were 17.0 mg/L (June 2024), 16.9 mg/L (October 2024), and 22.6 mg/L (October 2024, environmental duplicate sample). The historical NPN concentrations for CYN-MW12 are all above the EPA MCL, and the range is approximately 11 to 23 mg/L, with an overall slightly increasing trend with high variability over the life of the well.
- CYN-MW13 (Figure 7C-4): The NPN concentrations were 23.8 mg/L (June 2024) and 24.5 mg/L (October 2024). The historical NPN concentrations for CYN-MW13 are all above the EPA MCL, and the range is approximately 24 to 40 mg/L, with an overall slightly decreasing trend over the life of the well.
- CYN-MW14A (Figure 7C-5): The NPN concentrations were 11.8 mg/L (June 2024), 11.9 mg/L (June 2024, environmental duplicate sample), and 11.4 mg/L (October 2024). The historical NPN concentrations for CYN-MW14A are all at or above the EPA MCL, and the range is approximately 10 to 16 mg/L, with an overall slightly decreasing trend over the life of the well.

Table 7B-2 presents the DRO and GRO results. EPA MCLs for DRO and GRO have not been established. GRO was not detected in any sample collected during either sampling event. DRO was detected in the June 2024 environmental sample collected from monitoring well CYN-MW9 at a concentration of 102 µg/L. DRO below the practical quantitation limit (PQL) (J-qualified) was detected in the October/November 2024 environmental samples collected from monitoring wells CYN-MW8, CYN-MW9, and CYN-MW18, with a concentration of 103 µg/L in the CYN-MW9 environmental sample. DRO in the CYN-MW8 and CYN-MW18 environmental samples was qualified as not detected at the PQL because the results were below the PQL in the environmental samples and associated method blank samples.

7.6.2 Analytical Results for Waste Characterization Samples

The waste characterization samples (Table 7-5) were analyzed for volatile organic compounds (VOCs), major anions (bromide, chloride, fluoride, and sulfate), alkalinity, Target Analyte List (TAL) metals, gamma spectroscopy short list (americium-241, cesium-137, cobalt-60, and potassium-40), gross alpha/beta activity, isotopic uranium, and tritium.

Table 7B-3 presents the VOC results; Tables 7B-4 and 7B-5 list the MDLs for the VOCs and HE compounds, respectively. No VOCs except for acetone and methylene chloride were detected. Acetone was reported for monitoring well CYN-MW7 at a concentration of 1.88 µg/L and methylene chloride was reported for monitoring wells CYN-MW4, CYN-MW10, CYN-MW11, CYN-MW13, CYN-MW16, CYN-MW17, and CYN-MW18 at a maximum concentration of 4.20 µg/L, below the EPA MCL of 5.00 µg/L. Acetone and methylene chloride were qualified during data validation as not detected at the PQL because the results were below the PQL in the waste characterization samples and associated trip blank samples. No HE compounds were detected.

Table 7B-6 presents the major anion and alkalinity results. Table 7B-7 presents the TAL metals results. Table 7B-8 presents the gamma spectroscopy short list, gross alpha/beta activity, isotopic uranium, and tritium results. Gross alpha activity was measured in accordance with 40 CFR Part 141 and used as a radiological screening tool. An SNL/NM health physicist reviewed the results to screen for radiological anomalies and to verify that levels were within acceptable limits.

7.6.3 Field Water Quality Parameter Measurements

Table 7B-9 presents the field water quality parameter measurements obtained at the end of purging and before sample collection (Chapter 1.0, Section 1.3.1.2) at each monitoring well during both sampling events. The field water quality parameters measured consisted of temperature, specific conductivity, oxidation-reduction potential, potential of hydrogen, turbidity, and dissolved oxygen. These parameters were measured to evaluate water chemistry stability and ensure the collection of representative groundwater samples.

7.7 Quality Control Results

This section summarizes the CY 2024 field quality control (QC) sample results and their impact on data quality. Chapter 1.0, Section 1.3 describes how the field QC samples were collected and prepared. Table 1-7 (Section 1.3.4) lists each field QC sample type and purpose.

The field QC samples included environmental duplicate, equipment blank, field blank, and trip blank samples.

The environmental duplicate samples (Table 7-5) were analyzed for NPN, DRO, and GRO. Relative percent differences (RPDs) were calculated for the analytes detected in both the duplicate and original environmental samples. The sample pairs for both sampling events showed good agreement based on the RPD of 29 or less for the analytes (i.e., less than the RPD goal of 35).

The equipment blank samples were analyzed for all analytes (Table 7-5). The equipment blank sample results are as follows:

- May/June 2024 Sampling Event: Three equipment blank samples associated with monitoring wells CYN-MW8, CYN-MW14A, and CYN-MW17 were collected before sampling of the wells began. Acetone, bromodichloromethane, bromoform, 2-butanone, chloride, chloroform, dibromochloromethane, fluoride, sodium, and sulfate were detected in the equipment blank samples; however, no corrective action was necessary because these analytes were either not detected in the associated waste characterization samples or were detected at concentrations less than 10 times the waste characterization sample result.
- October/November 2024 Sampling Event: Four equipment blank samples associated with monitoring wells CYN-MW4, CYN-MW10, CYN-MW12, and CYN-MW19 were collected before sampling of the wells began. Neither GRO nor NPN was detected in the equipment blank samples. DRO below the PQL was detected in the October 2024 CYN-MW12 equipment blank sample at a concentration of 340 µg/L; however, no corrective action was necessary because DRO was not detected in the associated environmental sample.

The field blank samples were analyzed for VOCs (May/June sampling event) and GRO (both sampling events). The field blank sample results are as follows:

- May/June 2024 Sampling Event: Three field blank samples were collected at monitoring wells CYN-MW9, CYN-MW11, and CYN-MW12. GRO was not detected in the field blank samples. Acetone, bromodichloromethane, chloroform, and dibromochloromethane were detected in the field blank samples; however, no corrective action was necessary because these analytes were not detected in the associated waste characterization samples.
- October/November 2024 Sampling Event: Four field blank samples were collected at monitoring wells CYN-MW9, CYN-MW10, CYN-MW11, and CYN-MW16. No analytes were detected in the field blank samples.

The trip blank samples were analyzed for VOCs (May/June sampling event) and GRO (both sampling events). The trip blank sample results are as follows:

- May/June 2024 Sampling Event: A total of 17 trip blank samples were submitted and analyzed. GRO was not detected in the trip blank samples. Acetone and methylene chloride were detected in the trip blank samples. Acetone for monitoring well CYN-MW7 and methylene chloride for monitoring wells CYN-MW4, CYN-MW10, CYN MW13, CYN-MW16, CYN-MW17, and CYN-MW18 were qualified during data validation as not detected at the PQL because the results were below the PQL in the trip blank samples and associated waste characterization samples.
- October/November 2024 Sampling Event: A total of 18 trip blank samples were analyzed. GRO was not detected in the trip blank samples.

7.8 Variances and Nonconformances

All CY 2024 BSG AOC groundwater monitoring activities were performed and documented in accordance with the Consent Order and the CY 2024 Comprehensive Site-Wide Plan.

Groundwater sampling at monitoring well CYN-MW15 has become problematic. During the May/June and October/November 2024 sampling events, the well purged dry and did not recover sufficient volume for sample collection. The well's status was fully documented in the *Environmental Restoration Operations Consolidated Quarterly Report, January 2024* (SNL/NM, January 2024). SNL/NM personnel will continue to monitor the water level at the well and will evaluate the possibility of redeveloping the well. The Environmental Restoration Operations Program will continue to update the NMED on the well's status through consolidated quarterly reports and annual groundwater monitoring reports.

7.9 Summary and Conclusions

The BSG AOC is located in the vicinity of the active Lurance Canyon Burn Site Testing Facility. Groundwater investigations were initiated in 1997 at the NMED's request after elevated nitrate concentrations were discovered in the Burn Site Well (non-potable production well).

Groundwater samples were collected from 13 BSG AOC monitoring wells in May/June and October/November 2024 and were analyzed for NPN, DRO, GRO, VOCs, HE compounds, major anions, alkalinity, TAL metals, gamma spectroscopy short list, gross alpha/beta activity, isotopic uranium, and tritium.

In CY 2024, NPN was the only analyte detected at concentrations exceeding the EPA MCL. NPN exceeded the EPA MCL of 10 mg/L in the environmental samples collected from five monitoring wells (CYN-MW9, CYN-MW10, CYN-MW12, CYN-MW13, and CYN-MW14A), with a maximum concentration of 34.0 mg/L in the October 2024 CYN-MW9 environmental sample. As Figure 7-4 shows, two distinct NPN plumes exceeding the EPA MCL of 10 mg/L have been identified. The areal extent of NPN contamination has been fully delineated by the current BSG AOC monitoring well network.

7.10 Summary of Future Activities

CY 2025 BSG AOC groundwater monitoring activities will include:

- Quarterly water level measurements at 16 BSG AOC monitoring wells and the Burn Site Well.
- Semiannual collection and analysis of groundwater samples from 14 BSG AOC monitoring wells (CYN-MW4, CYN-MW7, CYN-MW8, CYN-MW9, CYN-MW10, CYN-MW11, CYN-MW12, CYN-MW13, CYN-MW14A, CYN-MW15 [if water levels recover], CYN-MW16, CYN-MW17, CYN-MW18, and CYN-MW19) during the second and fourth quarters of CY 2025 (SNL/NM, April 2024).
- Annual reporting of the monitoring activities and results in the CY 2025 annual groundwater monitoring report.
- Submittal of the CY 2026 comprehensive site-wide groundwater monitoring plan to the NMED in April 2025.

Attachment 7A
Historical Timeline of the Burn Site Groundwater Area of Concern

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Table 7A-1
Historical Timeline of the Burn Site Groundwater Area of Concern

Month	Year	Event	Reference
	1967-early 1980s	HE outdoor testing conducted at the BSG AOC until early 1980s. Burn testing began in 1970s using excavation pits and portable burn pans with JP-4. Open detonations of HE materials conducted. Wastewater discharged into unlined pits.	SNL/NM, November 2001
	1987	Eighteen potential SWMUs were identified in the area during the Comprehensive Environmental Assessment and Response Program investigation. HE compounds, nitrate, and diesel range organics identified as potential COCs.	DOE, September 1987
February	1996	Burn Site Well (a non-potable production well) was installed at the eastern edge of the HE testing area.	SNL/NM, April 2008a
November	1996	Groundwater sample from Burn Site Well yielded a nitrate concentration of 25 mg/L.	SNL/NM, January 2005
July	1997	NMED/DOE OB, DOE, and SNL/NM personnel agreed on installation of deep and shallow monitoring wells and one year of quarterly sampling.	SNL/NM, July 1997
November	1997	Monitoring wells CYN-MW2S and 12AUP01 were installed to serve as piezometers. Piezometers are constructed of narrow-diameter casing and not used for collecting groundwater samples.	SNL/NM, June 1998
December	1997	Monitoring well CYN-MW1D installed.	SNL/NM, June 1998
February	1998	Site-Wide Hydrogeologic Characterization Project, Calendar Year 1995 Annual Report containing description of BSG hydrogeology submitted to the NMED.	SNL/NM, February 1998
March	1999	GWPP Fiscal Year 1998 Annual Groundwater Monitoring Report provided BSG analytical data.	SNL/NM, March 1999
June	1999	Monitoring wells CYN-MW3 and CYN-MW4 installed.	SNL/NM, November 2001
	Various (e.g., 1994)	SWMUs 94 and 65 located at BSG AOC proposed and approved for NFA/CAC.	Numerous references, for example: SNL/NM, February 2004
March	2000	GWPP Fiscal Year 1999 Annual Groundwater Monitoring Report provided BSG analytical data.	SNL/NM, March 2000
April	2001	GWPP Fiscal Year 2000 Annual Groundwater Monitoring Report provided BSG analytical data.	SNL/NM, April 2001
August	2001	Monitoring well CYN-MW5 installed 1.7 miles west of the BSG AOC.	SNL/NM, June 2005
November	2001	Comprehensive BSG Investigation Report documenting hydrogeologic characteristics of the study area prepared.	SNL/NM, November 2001
March	2002	GWPP Fiscal Year 2001 Annual Groundwater Monitoring Report provided BSG analytical data.	SNL/NM, March 2002
March	2003	GWPP Fiscal Year 2002 Annual Groundwater Monitoring Report provided BSG analytical data.	SNL/NM, March 2003
June	2003	Further refinements of the hydrogeologic setting of the BSG AOC were presented.	Van Hart, June 2003
	2003	Burn Site Well (non-potable production well) removed from use.	None
March	2004	GWPP Fiscal Year 2003 Annual Groundwater Monitoring Report provided BSG analytical data.	SNL/NM, March 2004
April	2004	Compliance Order on Consent lists BSG as an AOC that requires a CME.	NMED, April 2004
June	2004	A CCM of the BSG AOC prepared.	SNL/NM, June 2004a
June	2004	A CME Work Plan for the BSG AOC prepared.	SNL/NM, June 2004b
January	2005	Nitrate source evaluation of deep soil in the BSG AOC performed.	SNL/NM, January 2005
February	2005	NMED required additional site characterization and the preparation of an Interim Measures Work Plan.	NMED, February 2005

See notes at end of table.

Table 7A-1 (continued)
Historical Timeline of the Burn Site Groundwater Area of Concern

Month	Year	Event	Reference
May	2005	BSG Interim Measures Work Plan submitted to the NMED.	SNL/NM, May 2005
July	2005	NMED sent an RSI for the Interim Measures Work Plan.	NMED, July 2005
August	2005	Response for RSI is submitted to the NMED.	SNL/NM, August 2005
October	2005	GWPP Fiscal Year 2004 Annual Groundwater Monitoring Report provided BSG analytical data.	SNL/NM, October 2005
December	2005	Monitoring wells CYN-MW6 and CYN-MW7 installed.	SNL/NM, October 2006
January	2006	Monitoring well CYN-MW8 installed.	SNL/NM, October 2006
March	2007	GWPP Fiscal Year 2006 Annual Groundwater Monitoring Report provided BSG analytical data.	SNL/NM, March 2007
March	2008	GWPP Fiscal Year 2007 Annual Groundwater Monitoring Report provided BSG analytical data.	SNL/NM, March 2008
April	2008	BSG CCM resubmitted to the NMED.	SNL/NM, April 2008a
April	2008	BSG CME Work Plan resubmitted to the NMED.	SNL/NM, April 2008b
April	2009	NMED required supplemental characterization of soil and groundwater in the BSG AOC.	NMED, April 2009
June	2009	GWPP Calendar Year 2008 Annual Groundwater Monitoring Report provided BSG analytical data.	SNL/NM, June 2009
November	2009	BSG Characterization Work Plan submitted to the NMED.	SNL/NM, November 2009
February	2010	Received notice of conditional approval for the November 2009 BSG Characterization Work Plan.	NMED, February 2010
July	2010	Completed subsurface soil sampling at 10 deep soil boring locations to determine contaminant sources.	SNL/NM, November 2009
July	2010	Installed four groundwater monitoring wells (CYN-MW9, CYN-MW10, CYN-MW11, and CYN-MW12) to determine extent of groundwater contamination.	SNL/NM, January 2012
September	2010	An extension request for the BSG CME Report submitted to the NMED.	SNL/NM, September 2010
October	2010	Received approval of a time extension for submittal of the BSG CME Report.	NMED, October 2010
October	2010	GWPP Calendar Year 2009 Annual Groundwater Monitoring Report provided BSG analytical data.	SNL/NM, October 2010
August	2011	Received approval of the April 2008 CME Work Plan.	NMED, August 2011
September	2011	GWPP Calendar Year 2010 Annual Groundwater Monitoring Report provided BSG analytical data.	SNL/NM, September 2011
January	2012	Summary Report for BSG Characterization Field Program submitted to the NMED.	SNL/NM, January 2012
February	2012	Monitoring Well Plug and Abandonment Plan and Well Construction Plan for BSG wells and status of CYN-MW3 submitted to the NMED.	SNL/NM, February 2012
April	2012	Received notice of approval for the 2012 BSG Monitoring Well Plug and Abandonment Plan and Well Construction Plan.	NMED, April 2012
June	2012	Received notice of approval for the January 2012 Summary Report for the BSG Characterization Field Program.	NMED, June 2012
September	2012	GWPP Calendar Year 2011 Annual Groundwater Monitoring Report provided BSG analytical data.	SNL/NM, September 2012
December	2012	Completed field program to decommission BSG monitoring wells 12AUP01, CYN-MW1D, CYN-MW2S, and install monitoring well CYN-MW13.	SNL/NM, March 2013
August	2013	Submitted an Extension Request to the NMED for the BSG CME Report to March 31, 2014.	DOE, August 2013
September	2013	Groundwater sampling analytical results for BSG wells reported in the Calendar Year 2012 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, September 2013b

See notes at end of table.

Table 7A-1 (continued)
Historical Timeline of the Burn Site Groundwater Area of Concern

Month	Year	Event	Reference
September	2013	Monitoring Well Plug and Abandonment Plan and Well Construction Plan for Installation of Groundwater Monitoring Wells CYN-MW14 and CYN-MW15 submitted to the NMED.	SNL/NM, September 2013a
October	2013	DOE Office of Environmental Management submitted the first Internal Remedy Review of the BSG AOC to DOE/NNSA Sandia Field Office.	DOE, October 2013
January	2014	DOE/NNSA requested an extension to the delivery date of the BSG CME Report to March 31, 2016.	DOE, January 2014
June	2014	Received approval for the installation of groundwater monitoring wells CYN-MW14A and CYN-MW15.	NMED, June 2014a
June	2014	NMED approved the proposed extension request for the BSG CME Report to March 31, 2016.	NMED, June 2014b
June	2014	Groundwater sampling analytical results for BSG wells reported in the Calendar Year 2013 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, June 2014
November	2014	DOE Office of Environmental Management submitted the second Internal Remedy Review of the BSG AOC to DOE/NNSA Sandia Field Office.	DOE, November 2014
December	2014	Installed groundwater monitoring wells CYN-MW14A and CYN-MW15.	SNL/NM, April 2015
April	2015	Summary Report for Installation of Groundwater Monitoring Wells CYN-MW14A and CYN-MW15 submitted to the NMED.	SNL/NM, April 2015
May	2015	DOE Office of Environmental Management submitted the third Internal Remedy Review of the BSG AOC to DOE/NNSA Sandia Field Office.	DOE, May 2015
June	2015	Received approval for the Installation Report for CYN-MW14A and CYN-MW15.	NMED, June 2015
June	2015	Groundwater sampling analytical results for BSG wells reported in the Calendar Year 2014 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, June 2015
March	2016	Proposed weight-of-evidence activities and schedule milestones for implementation of the studies.	DOE, March 2016
April	2016	NMED approved the activities and milestones proposed by DOE/NNSA for the weight-of-evidence activities.	NMED, April 2016
June	2016	Aquifer Pumping Test Work Plan submitted to the NMED.	SNL/NM, June 2016a
June	2016	Groundwater sampling analytical results for BSG wells reported in the Calendar Year 2015 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, June 2016b
June	2016	NMED approved the Aquifer Pumping Test Work Plan.	NMED, June 2016
July	2016	Prepared stable isotope denitrification and groundwater age dating report summary.	Madrid et. al., July 2016
March	2017	Field requirements of the Aquifer Pumping Test were completed, including long-term transducer study, step drawdown test, constant rate test, and groundwater interval sampling for nitrate.	SNL/NM, December 2017
May	2017	Preliminary results of the pumping test were shared with NMED on May 10, 2017 at the NMED District 1 office.	SNL/NM, December 2017
June	2017	Groundwater sampling analytical results for BSG wells reported in the Calendar Year 2016 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, July 2017
November	2017	Requested an extension for the submittal of recommendations for further characterization activities.	DOE, November 2017
November	2017	NMED approved the extension request.	NMED, November 2017
December	2017	Aquifer Pumping Test Report submitted to the NMED.	SNL/NM, December 2017

See notes at end of table.

Table 7A-1 (continued)
Historical Timeline of the Burn Site Groundwater Area of Concern

Month	Year	Event	Reference
January	2018	NMED approved the Aquifer Pumping Test Report.	NMED, January 2018
June	2018	Proposed recommendations for additional site characterization.	DOE, June 2018
June	2018	NMED disapproved the proposed recommendations and required the submittal of a Well Installation Work Plan.	NMED, June 2018
June	2018	Groundwater sampling analytical results for BSG wells reported in the Calendar Year 2017 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, June 2018
January	2019	Monitoring Well Installation Work Plan for CYN-MW16 through CYN-MW23 submitted to the NMED.	SNL/NM, January 2019
February	2019	NMED approved the Monitoring Well Installation Work Plan.	NMED, February 2019
June	2019	Groundwater sampling analytical results for BSG wells reported in the Calendar Year 2018 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, June 2019
September	2019	Monitoring well field program started.	SNL/NM, May 2020
December	2019	Monitoring well field program completed. Four monitoring wells (CYN-MW16, CYN-MW17, CYN-MW18, and CYN-MW19) were installed and sampled.	SNL/NM, May 2020
May	2020	Monitoring Well Installation Report for CYN-MW16 through CYN-MW19 submitted to the NMED.	SNL/NM, May 2020
June	2020	Extension request for CCM/CME submitted to the NMED.	SNL/NM, June 2020a
June	2020	Groundwater sampling analytical results for BSG wells reported in the Calendar Year 2019 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, June 2020b
July	2020	NMED approved the Monitoring Well Installation Report.	NMED, July 2020a
July	2020	NMED approved the CCM/CME extension request (new due date is January 31, 2023).	NMED, July 2020b
September	2020	Preliminary results from the first four quarterly sampling events at the four new monitoring wells were shared with the NMED on September 23, 2020.	SNL/NM, June 2021
November	2020	Final perchlorate sampling event at CYN-MW15 based on four consecutive non detections.	SNL/NM, April 2021
May	2021	Preliminary results from the first six quarterly sampling events at the four new monitoring wells were shared with the NMED on May 11, 2021.	SNL/NM, October 2021
June	2021	Groundwater sampling analytical results for BSG wells reported in the Calendar Year 2020 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, June 2021
November	2021	An evaluation of the groundwater monitoring well network was sent to the NMED on November 5, 2021.	DOE, November 2021
December	2021	NMED approved the evaluation of the groundwater monitoring well network.	NMED, December 2021
June	2022	Groundwater sampling analytical results for BSG wells reported in the Calendar Year 2021 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, June 2022
January	2023	Submitted the BSG AOC CCM/CME Report to the NMED.	SNL/NM, January 2023
May	2023	Email notification sent to the NMED regarding the status of monitoring well CYN-MW15.	SNL/NM, January 2024
June	2023	Groundwater sampling analytical results for BSG wells reported in the Calendar Year 2022 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, June 2023
February	2024	NMED issued a public notice and provided a fact sheet and statement of basis for the selected remedy to the public and stakeholders for their review and comments.	NMED, February 2024
May	2024	NMED approved the Final Remedy Selection for BSG AOC CME.	NMED, May 2024

See notes at end of table.

Table 7A-1 (concluded)
Historical Timeline of the Burn Site Groundwater Area of Concern

Month	Year	Event	Reference
July	2024	Groundwater sampling analytical results for BSG wells reported in the Calendar Year 2023 SNL/NM Annual Groundwater Monitoring Report.	SNL/NM, July 2024
December	2024	Submitted the BSG AOC Corrective Measures Implementation Plan to NMED.	SNL/NM, December 2024

Notes:
AOC = Area of Concern
BSG = Burn Site Groundwater
CAC = Corrective Action Complete
CCM = Current Conceptual Model
CME = Corrective Measures Evaluation
CYN = Canyons
COC = constituent of concern
DOE = U.S. Department of Energy
GWPP = Groundwater Protection Program
HE = high explosive
JP-4 = jet propellant, fuel grade 4
mg/L = milligram(s) per liter
MW = Monitoring Well
NFA = No Further Action
NMED = New Mexico Environment Department
NNSA = National Nuclear Security Administration
OB = Oversight Bureau
RSI = Request for Supplemental Information
SNL/NM = Sandia National Laboratories, New Mexico
SWMU = Solid Waste Management Unit

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Attachment 7B
Burn Site Groundwater Area of Concern Analytical Results Tables

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Attachment 7B Tables

Table 7B-1 Summary of Nitrate plus Nitrite Results for Environmental Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 7B-5

Table 7B-2 Summary of Diesel Range Organics and Gasoline Range Organics Results for Environmental Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024 ..... 7B-7

Table 7B-3 Summary of Detected Volatile Organic Compounds for Waste Characterization Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024..... 7B-9

Table 7B-4 Method Detection Limits for Volatile Organic Compounds (EPA Method SW846-8260D), Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024..... 7B-10

Table 7B-5 Method Detection Limits for High Explosive Compounds (EPA Method SW846-8330B), Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024..... 7B-11

Table 7B-6 Summary of Major Anion and Alkalinity Results for Waste Characterization Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024..... 7B-12

Table 7B-7 Summary of Target Analyte List Metals Results for Waste Characterization Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024..... 7B-14

Table 7B-8 Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, Isotopic Uranium, and Tritium Results for Waste Characterization Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024..... 7B-27

Table 7B-9 Summary of Field Water Quality Parameter Measurements, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024..... 7B-32

Notes for Burn Site Groundwater Area of Concern Analytical Results Tables..... 7B-33

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Table 7B-1
Summary of Nitrate plus Nitrite Results for Environmental Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL[d] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CYN-MW4 28-May-24	Nitrate plus nitrite	0.127	0.0170	0.0500	10.0			122326-005	EPA 353.2
CYN-MW7 30-May-24	Nitrate plus nitrite	2.58	0.170	0.500	10.0			122350-005	EPA 353.2
CYN-MW8 04-Jun-24	Nitrate plus nitrite	4.48	0.170	0.500	10.0			122364-005	EPA 353.2
CYN-MW8 (Duplicate) 04-Jun-24	Nitrate plus nitrite	4.70	0.170	0.500	10.0			122365-003	EPA 353.2
CYN-MW9 24-Jun-24	Nitrate plus nitrite	**33.5**	1.70	5.00	10.0			122415-005	EPA 353.2
CYN-MW10 13-Jun-24	Nitrate plus nitrite	**23.9**	0.425	1.25	10.0			122410-005	EPA 353.2
CYN-MW11 12-Jun-24	Nitrate plus nitrite	7.18	0.425	1.25	10.0			122381-005	EPA 353.2
CYN-MW12 10-Jun-24	Nitrate plus nitrite	**17.0**	0.850	2.50	10.0			122408-005	EPA 353.2
CYN-MW13 17-Jun-24	Nitrate plus nitrite	**23.8**	0.425	1.25	10.0			122412-005	EPA 353.2
CYN-MW14A 11-Jun-24	Nitrate plus nitrite	**11.8**	0.850	2.50	10.0			122401-005	EPA 353.2
CYN-MW14A (Duplicate) 11-Jun-24	Nitrate plus nitrite	**11.9**	0.850	2.50	10.0			122402-003	EPA 353.2
CYN-MW16 06-Jun-24	Nitrate plus nitrite	7.50	0.425	1.25	10.0			122375-005	EPA 353.2
CYN-MW17 29-May-24	Nitrate plus nitrite	2.35	0.170	0.500	10.0			122343-005	EPA 353.2
CYN-MW17 (Duplicate) 29-May-24	Nitrate plus nitrite	2.60	0.170	0.500	10.0			122344-003	EPA 353.2
CYN-MW18 05-Jun-24	Nitrate plus nitrite	6.80	0.850	2.50	10.0			122369-005	EPA 353.2
CYN-MW19 03-Jun-24	Nitrate plus nitrite	3.36	0.0850	0.250	10.0			122355-005	EPA 353.2

See notes at end of tables.

Table 7B-1 (concluded)
Summary of Nitrate plus Nitrite Results for Environmental Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	MCL[d] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CYN-MW4 29-Oct-24	Nitrate plus nitrite	0.117	0.0170	0.0500	10.0			123205-003	EPA 353.2
CYN-MW4 (Duplicate) 29-Oct-24	Nitrate plus nitrite	0.116	0.0170	0.0500	10.0			123206-003	EPA 353.2
CYN-MW7 25-Nov-24	Nitrate plus nitrite	2.46	0.0850	0.250	10.0			123211-003	EPA 353.2
CYN-MW8 14-Nov-24	Nitrate plus nitrite	4.85	0.170	0.500	10.0			123218-003	EPA 353.2
CYN-MW9 31-Oct-24	Nitrate plus nitrite	**34.0**	0.850	2.50	10.0			123247-003	EPA 353.2
CYN-MW10 30-Oct-24	Nitrate plus nitrite	**21.0**	0.850	2.50	10.0		J	123237-003	EPA 353.2
CYN-MW10 (Duplicate) 30-Oct-24	Nitrate plus nitrite	**24.3**	0.850	2.50	10.0		J	123238-003	EPA 353.2
CYN-MW11 12-Nov-24	Nitrate plus nitrite	7.20	0.0850	0.250	10.0			123226-003	EPA 353.2
CYN-MW12 28-Oct-24	Nitrate plus nitrite	**16.9**	0.425	1.25	10.0			123232-003	EPA 353.2
CYN-MW12 (Duplicate) 28-Oct-24	Nitrate plus nitrite	**22.6**	0.425	1.25	10.0			123233-003	EPA 353.2
CYN-MW13 30-Oct-24	Nitrate plus nitrite	**24.5**	0.850	2.50	10.0			123244-003	EPA 353.2
CYN-MW14A 23-Oct-24	Nitrate plus nitrite	**11.4**	0.170	0.500	10.0			123228-003	EPA 353.2
CYN-MW16 22-Oct-24	Nitrate plus nitrite	6.95	0.425	1.25	10.0			123223-003	EPA 353.2
CYN-MW17 29-Oct-24	Nitrate plus nitrite	2.23	0.0850	0.250	10.0			123208-003	EPA 353.2
CYN-MW18 13-Nov-24	Nitrate plus nitrite	6.23	0.170	0.500	10.0			123220-003	EPA 353.2
CYN-MW19 21-Oct-24	Nitrate plus nitrite	3.20	0.0850	0.250	10.0			123215-003	EPA 353.2
CYN-MW19 (Duplicate) 21-Oct-24	Nitrate plus nitrite	3.13	0.0850	0.250	10.0			123216-003	EPA 353.2

See notes at end of tables.

Table 7B-2
Summary of Diesel Range Organics and Gasoline Range Organics Results for Environmental Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (µg/L)	MDL[b] (µg/L)	PQL[c] (µg/L)	MCL[d] (µg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CYN-MW4	Diesel Range Organics	ND	75.0	200	NE	U		122326-003	SW846-3535A/8015D
28-May-24	Gasoline Range Organics	ND	16.7	100	NE	U		122326-004	SW846-8015D GRO
CYN-MW7	Diesel Range Organics	ND	71.0	189	NE	U,*	UJ	122350-003	SW846-3535A/8015D
30-May-24	Gasoline Range Organics	ND	16.7	100	NE	U		122350-004	SW846-8015D GRO
CYN-MW8	Diesel Range Organics	ND	80.8	216	NE	U		122364-003	SW846-3535A/8015D
04-Jun-24	Gasoline Range Organics	ND	16.7	100	NE	U		122364-004	SW846-8015D GRO
CYN-MW8 (Duplicate)	Diesel Range Organics	ND	80.2	214	NE	U		122365-001	SW846-3535A/8015D
04-Juny-24	Gasoline Range Organics	ND	16.7	100	NE	U		122365-002	SW846-8015D GRO
CYN-MW9	Diesel Range Organics	102	75.0	200	NE	J	J+	122415-003	SW846-3535A/8015D
24-Jun-24	Gasoline Range Organics	ND	16.7	100	NE	U		122415-004	SW846-8015D GRO
CYN-MW10	Diesel Range Organics	ND	77.3	206	NE	U, *	UJ	122410-003	SW846-3535A/8015D
13-Jun-24	Gasoline Range Organics	ND	16.7	100	NE	U		122410-004	SW846-8015D GRO
CYN-MW11	Diesel Range Organics	ND	75.0	200	NE	U, *	UJ	122381-003	SW846-3535A/8015D
12-Jun-24	Gasoline Range Organics	ND	16.7	100	NE	U		122381-004	SW846-8015D GRO
CYN-MW12	Diesel Range Organics	ND	80.0	213	NE	U		122408-003	SW846-3535A/8015D
10-Jun-24	Gasoline Range Organics	ND	16.7	100	NE	U		122408-004	SW846-8015D GRO
CYN-MW13	Diesel Range Organics	ND	75.0	200	NE	U		122412-003	SW846-3535A/8015D
17-Jun-24	Gasoline Range Organics	ND	16.7	100	NE	U		122412-004	SW846-8015D GRO
CYN-MW14A	Diesel Range Organics	ND	75.0	200	NE	U		122401-003	SW846-3535A/8015D
11-Jun-24	Gasoline Range Organics	ND	16.7	100	NE	U		122401-004	SW846-8015D GRO
CYN-MW14A (Duplicate)	Diesel Range Organics	ND	78.9	210	NE	U		122402-001	SW846-3535A/8015D
11-Jun-24	Gasoline Range Organics	ND	16.7	100	NE	U		122402-002	SW846-8015D GRO
CYN-MW16	Diesel Range Organics	ND	82.9	221	NE	h, U	UJ	122375-003	SW846-3535A/8015D
06-Jun-24	Gasoline Range Organics	ND	16.7	100	NE	U		122375-004	SW846-8015D GRO
CYN-MW17	Diesel Range Organics	ND	75.0	200	NE	U		122343-003	SW846-3535A/8015D
29-May-24	Gasoline Range Organics	ND	16.7	100	NE	U		122343-004	SW846-8015D GRO
CYN-MW17 (Duplicate)	Diesel Range Organics	ND	79.8	213	NE	U		122344-001	SW846-3535A/8015D
29-May-24	Gasoline Range Organics	ND	16.7	100	NE	U		122344-002	SW846-8015D GRO
CYN-MW18	Diesel Range Organics	ND	80.3	214	NE	h, U	UJ	122369-003	SW846-3535A/8015D
05-Jun-24	Gasoline Range Organics	ND	16.7	100	NE	U		122369-004	SW846-8015D GRO
CYN-MW19	Diesel Range Organics	ND	75.0	200	NE	U		122355-003	SW846-3535A/8015D
03-Jun-24	Gasoline Range Organics	ND	16.7	100	NE	U		122355-004	SW846-8015D GRO

See notes at end of tables.

Table 7B-2 (concluded)
Summary of Diesel Range Organics and Gasoline Range Organics Results for Environmental Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (µg/L)	MDL[b] (µg/L)	PQL[c] (µg/L)	MCL[d] (µg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CYN-MW4	Diesel Range Organics	ND	75.0	200	NE	U		123205-002	SW846-3535A/8015D
29-Oct-24	Gasoline Range Organics	ND	16.7	100	NE	U		123205-001	SW846-8015D GRO
CYN-MW4 (Duplicate)	Diesel Range Organics	ND	84.4	225	NE	U		123206-002	SW846-3535A/8015D
29-Oct-24	Gasoline Range Organics	ND	16.7	100	NE	U		123206-001	SW846-8015D GRO
CYN-MW7	Diesel Range Organics	ND	75.0	200	NE	U		123211-002	SW846-3535A/8015D
25-Nov-24	Gasoline Range Organics	ND	16.7	100	NE	U		123211-001	SW846-8015D GRO
CYN-MW8	Diesel Range Organics	94.2	76.5	204	NE	B, J, N, *	204UJ	123218-002	SW846-3535A/8015D
14-Nov-24	Gasoline Range Organics	ND	16.7	100	NE	U		123218-001	SW846-8015D GRO
CYN-MW9	Diesel Range Organics	103	81.2	217	NE	J		123247-002	SW846-3535A/8015D
31-Oct-24	Gasoline Range Organics	ND	16.7	100	NE	U		123247-001	SW846-8015D GRO
CYN-MW10	Diesel Range Organics	ND	79.8	213	NE	U		123237-002	SW846-3535A/8015D
30-Oct-24	Gasoline Range Organics	ND	16.7	100	NE	U		123237-001	SW846-8015D GRO
CYN-MW10 (Duplicate)	Diesel Range Organics	ND	80.7	215	NE	U		123238-002	SW846-3535A/8015D
30-Oct-24	Gasoline Range Organics	ND	16.7	100	NE	U		123238-001	SW846-8015D GRO
CYN-MW11	Diesel Range Organics	ND	75.0	200	NE	U		123226-002	SW846-3535A/8015D
12-Nov-24	Gasoline Range Organics	ND	16.7	100	NE	U		123226-001	SW846-8015D GRO
CYN-MW12	Diesel Range Organics	ND	82.4	220	NE	U		123232-002	SW846-3535A/8015D
28-Oct-24	Gasoline Range Organics	ND	16.7	100	NE	U		123232-001	SW846-8015D GRO
CYN-MW12 (Duplicate)	Diesel Range Organics	ND	81.5	217	NE	U		123233-002	SW846-3535A/8015D
28-Oct-24	Gasoline Range Organics	ND	16.7	100	NE	U		123233-001	SW846-8015D GRO
CYN-MW13	Diesel Range Organics	ND	79.7	212	NE	U		123244-002	SW846-3535A/8015D
30-Oct-24	Gasoline Range Organics	ND	16.7	100	NE	U		123244-001	SW846-8015D GRO
CYN-MW14A	Diesel Range Organics	ND	75.0	200	NE	U		123228-002	SW846-3535A/8015D
23-Oct-24	Gasoline Range Organics	ND	16.7	100	NE	U		123228-001	SW846-8015D GRO
CYN-MW16	Diesel Range Organics	ND	75.0	200	NE	N, U		123223-002	SW846-3535A/8015D
22-Oct-24	Gasoline Range Organics	ND	16.7	100	NE	U		123223-001	SW846-8015D GRO
CYN-MW17	Diesel Range Organics	ND	75.0	200	NE	U		123208-002	SW846-3535A/8015D
29-Oct-24	Gasoline Range Organics	ND	16.7	100	NE	U		123208-001	SW846-8015D GRO
CYN-MW18	Diesel Range Organics	79.1	75.0	200	NE	B, J, N, *	200UJ	123220-002	SW846-3535A/8015D
13-Nov-24	Gasoline Range Organics	ND	16.7	100	NE	U		123220-001	SW846-8015D GRO
CYN-MW19	Diesel Range Organics	ND	75.0	200	NE	N, U		123215-002	SW846-3535A/8015D
21-Oct-24	Gasoline Range Organics	ND	16.7	100	NE	U		123215-001	SW846-8015D GRO
CYN-MW19 (Duplicate)	Diesel Range Organics	ND	80.1	214	NE	N, U		123216-002	SW846-3535A/8015D
21-Oct-24	Gasoline Range Organics	ND	16.7	100	NE	U		123216-001	SW846-8015D GRO

See notes at end of tables.

Table 7B-3
Summary of Detected Volatile Organic Compounds for Waste Characterization Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (µg/L)	MDL[b] (µg/L)	PQL[c] (µg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CYN-MW4 28-May-24	Methylene chloride	0.600	0.500	5.00	J	5.00UJ	122326-001	SW846-8260D
CYN-MW7 30-May-24	Acetone	1.88	1.74	5.00	J	5.00U	122350-001	SW846-8260D
CYN-MW10 13-Jun-24	Methylene chloride	4.11	0.500	5.00	J	5.00U	122410-001	SW846-8260D
CYN-MW11 12-Jun-24	Methylene chloride	4.20	0.500	5.00	J	5.00U	122381-001	SW846-8260D
CYN-MW13 17-Jun-24	Methylene chloride	3.89	0.500	5.00	J	5.00U	122412-001	SW846-8260D
CYN-MW16 06-Jun-24	Methylene chloride	0.770	0.500	5.00	J	5.00UJ	122375-001	SW846-8260D
CYN-MW17 29-May-24	Methylene chloride	0.660	0.500	5.00	J	5.00UJ	122343-001	SW846-8260D
CYN-MW18 05-Jun-24	Methylene chloride	0.800	0.500	5.00	J	5.00UJ	122369-001	SW846-8260D

See notes at end of tables.

Table 7B-4
Method Detection Limits for Volatile Organic Compounds (EPA Method[g] SW846-8260D), Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Analyte	MDL[b] (µg/L)	Analyte	MDL[b] (µg/L)
1,1,1-Trichloroethane	0.333	Chlorobenzene	0.333
1,1,2,2-Tetrachloroethane	0.333	Chloroethane	0.333
1,1,2-Trichloroethane	0.333	Chloroform	0.333
1,1-Dichloroethane	0.333	Chloromethane	0.333
1,1-Dichloroethene	0.333	Cyclohexane	0.333
1,2,3-Trichlorobenzene	0.333	Dibromochloromethane	0.333
1,2,4-Trichlorobenzene	0.333	Dichlorodifluoromethane	0.355
1,2-Dibromo-3-chloropropane	0.333	Ethylbenzene	0.333
1,2-Dibromoethane	0.333	Isopropylbenzene	0.333
1,2-Dichlorobenzene	0.333	Methyl acetate	1.67
1,2-Dichloroethane	0.333	Methylcyclohexane	0.333
1,2-Dichloropropane	0.333	Methylene chloride	0.500
1,3-Dichlorobenzene	0.333	Styrene	0.333
1,4-Dichlorobenzene	0.333	Tert-butyl methyl ether	0.333
2,2-trifluoroethane, 1,1,2-Trichloro-1	1.67	Tetrachloroethene	0.333
2-Butanone	1.67	Toluene	0.333
2-Hexanone	1.67	Trichloroethene	0.333
4-methyl-, 2-Pentanone	1.67	Trichlorofluoromethane	0.333
Acetone	1.74	Vinyl chloride	0.333
Benzene	0.333	Xylene	1.00
Bromochloromethane	0.333	cis-1,2-Dichloroethene	0.333
Bromodichloromethane	0.333	cis-1,3-Dichloropropene	0.333
Bromoform	0.333	m-,p-Xylene	0.500
Bromomethane	0.337	o-Xylene	0.333
Carbon disulfide	1.67	trans-1,2-Dichloroethene	0.333
Carbon tetrachloride	0.333	trans-1,3-Dichloropropene	0.333

See notes at end of tables.

Table 7B-5
Method Detection Limits for High Explosive Compounds (EPA Method[g] SW846-8330B), Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Analyte	MDL[b] (µg/L)
1,3,5-Trinitrobenzene	0.0818 – 0.0859
1,3-Dinitrobenzene	0.0818 – 0.0859
2,4,6-Trinitrotoluene	0.0818 – 0.0859
2,4-Dinitrotoluene	0.0818 – 0.0859
2,6-Dinitrotoluene	0.0818 – 0.0859
2-Amino-4,6-dinitrotoluene	0.0818 – 0.0859
2-Nitrotoluene	0.0838 – 0.0880
3-Nitrotoluene	0.0818 – 0.0859
4-Amino-2,6-dinitrotoluene	0.0818 – 0.0859
4-Nitrotoluene	0.153 – 0.161
HMX	0.0818 – 0.0859
Nitro-benzene	0.0818 – 0.0859
Pentaerythritol tetranitrate	0.102 – 0.107
RDX	0.0818 – 0.0859
Tetryl	0.0818 – 0.0859

See notes at end of tables.

Table 7B-6
Summary of Major Anion and Alkalinity Results for Waste Characterization Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CYN-MW4	Bromide	0.377	0.0670	0.200			122326-006	SW846-9056A
28-May-24	Chloride	24.4	0.670	2.00	B		122326-006	SW846-9056A
	Fluoride	0.745	0.0330	0.100			122326-006	SW846-9056A
	Sulfate	134	1.33	4.00			122326-006	SW846-9056A
	Total Alkalinity as $CaCO_3$	236	0.725	2.00			122326-007	SM 2320B
CYN-MW7	Bromide	0.629	0.0670	0.200			122350-006	SW846-9056A
30-May-24	Chloride	41.9	0.670	2.00			122350-006	SW846-9056A
	Fluoride	1.33	0.0330	0.100			122350-006	SW846-9056A
	Sulfate	84.4	1.33	4.00			122350-006	SW846-9056A
	Total Alkalinity as $CaCO_3$	280	0.725	2.00			122350-007	SM 2320B
CYN-MW8	Bromide	0.758	0.0670	0.200			122364-006	SW846-9056A
04-Jun-24	Chloride	54.2	1.34	4.00			122364-006	SW846-9056A
	Fluoride	1.45	0.0330	0.100			122364-006	SW846-9056A
	Sulfate	117	2.66	8.00			122364-006	SW846-9056A
	Total Alkalinity as $CaCO_3$	257	0.725	2.00			122364-007	SM 2320B
CYN-MW9	Bromide	0.744	0.0670	0.200			122415-006	SW846-9056A
24-Jun-24	Chloride	56.8	0.670	2.00			122415-006	SW846-9056A
	Fluoride	0.572	0.0330	0.100			122415-006	SW846-9056A
	Sulfate	152	1.33	4.00			122415-006	SW846-9056A
	Total Alkalinity as $CaCO_3$	275	0.725	2.00			122415-007	SM 2320B
CYN-MW10	Bromide	0.851	0.0670	0.200			122410-006	SW846-9056A
13-Jun-24	Chloride	55.1	1.34	4.00			122410-006	SW846-9056A
	Fluoride	0.608	0.0330	0.100			122410-006	SW846-9056A
	Sulfate	165	2.66	8.00			122410-006	SW846-9056A
	Total Alkalinity as $CaCO_3$	265	0.725	2.00			122410-007	SM 2320B
CYN-MW11	Bromide	1.24	0.0670	0.200			122381-006	SW846-9056A
12-Jun-24	Chloride	89.0	1.34	4.00			122381-006	SW846-9056A
	Fluoride	0.777	0.0330	0.100			122381-006	SW846-9056A
	Sulfate	200	2.66	8.00			122381-006	SW846-9056A
	Total Alkalinity as $CaCO_3$	227	0.725	2.00			122381-007	SM 2320B
CYN-MW12	Bromide	1.44	0.0670	0.200			122408-006	SW846-9056A
10-Jun-24	Chloride	127	3.35	10.0	B		122408-006	SW846-9056A
	Fluoride	1.00	0.0330	0.100			122408-006	SW846-9056A
	Sulfate	366	6.65	20.0			122408-006	SW846-9056A
	Total Alkalinity as $CaCO_3$	236	0.725	2.00			122408-007	SM 2320B

See notes at end of tables.

Table 7B-6 (concluded)
Summary of Major Anion and Alkalinity Results for Waste Characterization Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CYN-MW13	Bromide	0.431	0.0670	0.200			122412-006	SW846-9056A
17-Jun-24	Chloride	23.9	0.670	2.00			122412-006	SW846-9056A
	Fluoride	1.71	0.0330	0.100			122412-006	SW846-9056A
	Sulfate	88.8	1.33	4.00			122412-006	SW846-9056A
	Total Alkalinity as $CaCO_3$	183	0.725	2.00			122412-007	SM 2320B
CYN-MW14A	Bromide	0.820	0.0670	0.200			122401-006	SW846-9056A
11-Jun-24	Chloride	60.3	1.34	4.00	B		122401-006	SW846-9056A
	Fluoride	0.932	0.0330	0.100			122401-006	SW846-9056A
	Sulfate	183	2.66	8.00			122401-006	SW846-9056A
	Total Alkalinity as $CaCO_3$	243	0.725	2.00			122401-007	SM 2320B
CYN-MW16	Bromide	0.615	0.0670	0.200			122375-006	SW846-9056A
06-Jun-24	Chloride	41.7	0.670	2.00	B		122375-006	SW846-9056A
	Fluoride	1.51	0.0330	0.100			122375-006	SW846-9056A
	Sulfate	113	1.33	4.00			122375-006	SW846-9056A
	Total Alkalinity as $CaCO_3$	208	0.725	2.00			122375-007	SM 2320B
CYN-MW17	Bromide	0.601	0.0670	0.200			122343-006	SW846-9056A
29-May-24	Chloride	31.1	0.670	2.00			122343-006	SW846-9056A
	Fluoride	1.72	0.0330	0.100			122343-006	SW846-9056A
	Sulfate	77.8	1.33	4.00			122343-006	SW846-9056A
	Total Alkalinity as $CaCO_3$	184	0.725	2.00			122343-007	SM 2320B
CYN-MW18	Bromide	0.654	0.0670	0.200			122369-006	SW846-9056A
05-Jun-24	Chloride	45.0	1.34	4.00	B		122369-006	SW846-9056A
	Fluoride	2.01	0.0330	0.100			122369-006	SW846-9056A
	Sulfate	199	2.66	8.00			122369-006	SW846-9056A
	Total Alkalinity as $CaCO_3$	205	0.725	2.00			122369-007	SM 2320B
CYN-MW19	Bromide	0.532	0.0670	0.200			122355-006	SW846-9056A
03-Jun-24	Chloride	32.0	0.670	2.00			122355-006	SW846-9056A
	Fluoride	0.633	0.0330	0.100			122355-006	SW846-9056A
	Sulfate	128	1.33	4.00			122355-006	SW846-9056A
	Total Alkalinity as $CaCO_3$	254	0.725	2.00			122355-007	SM 2320B

See notes at end of tables.

Table 7B-7
Summary of Target Analyte List Metals Results for Waste Characterization Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CYN-MW4	Aluminum	ND	0.0193	0.0500	U		122326-008	SW846-3005A/6020B
28-May-24	Antimony	0.00141	0.00100	0.00300	J		122326-008	SW846-3005A/6020B
	Arsenic	ND	0.00200	0.00500	U		122326-008	SW846-3005A/6020B
	Barium	0.0366	0.000670	0.00400			122326-008	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122326-008	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		122326-008	SW846-3005A/6020B
	Calcium	68.3	0.800	2.00			122326-008	SW846-3005A/6020B
	Chromium	ND	0.00300	0.0100	U		122326-008	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122326-008	SW846-3005A/6020B
	Copper	0.000350	0.000300	0.00200	J		122326-008	SW846-3005A/6020B
	Iron	0.0422	0.0330	0.100	J		122326-008	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122326-008	SW846-3005A/6020B
	Magnesium	32.2	0.0100	0.0300			122326-008	SW846-3005A/6020B
	Manganese	0.00122	0.00100	0.00500	J		122326-008	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U		122326-008	SW846-7470A
	Nickel	0.000631	0.000600	0.00200	J		122326-008	SW846-3005A/6020B
	Potassium	6.06	0.0800	0.300			122326-008	SW846-3005A/6020B
	Selenium	0.0120	0.00150	0.00500			122326-008	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122326-008	SW846-3005A/6020B
	Sodium	37.5	0.0800	0.250			122326-008	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122326-008	SW846-3005A/6020B
	Vanadium	ND	0.00330	0.0200	U		122326-008	SW846-3005A/6020B
	Zinc	0.00830	0.00330	0.0200	J		122326-008	SW846-3005A/6020B

See notes at end of tables.

Table 7B-7 (continued)
Summary of Target Analyte List Metals Results for Waste Characterization Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CYN-MW7	Aluminum	ND	0.0193	0.0500	U		122350-008	SW846-3005A/6020B
30-May-24	Antimony	ND	0.00100	0.00300	U		122350-008	SW846-3005A/6020B
	Arsenic	ND	0.00200	0.00500	U		122350-008	SW846-3005A/6020B
	Barium	0.104	0.000670	0.00400			122350-008	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122350-008	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		122350-008	SW846-3005A/6020B
	Calcium	99.0	0.800	2.00			122350-008	SW846-3005A/6020B
	Chromium	ND	0.00300	0.0100	U		122350-008	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122350-008	SW846-3005A/6020B
	Copper	0.000307	0.000300	0.00200	J		122350-008	SW846-3005A/6020B
	Iron	0.0581	0.0330	0.100	J		122350-008	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122350-008	SW846-3005A/6020B
	Magnesium	20.3	0.0100	0.0300			122350-008	SW846-3005A/6020B
	Manganese	ND	0.00100	0.00500	U		122350-008	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U		122350-008	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122350-008	SW846-3005A/6020B
	Potassium	2.34	0.0800	0.300			122350-008	SW846-3005A/6020B
	Selenium	0.00445	0.00150	0.00500	J		122350-008	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122350-008	SW846-3005A/6020B
	Sodium	37.5	0.0800	0.250			122350-008	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122350-008	SW846-3005A/6020B
	Vanadium	0.00408	0.00330	0.0200	J		122350-008	SW846-3005A/6020B
	Zinc	0.00395	0.00330	0.0200	J		122350-008	SW846-3005A/6020B

See notes at end of tables.

Table 7B-7 (continued)
Summary of Target Analyte List Metals Results for Waste Characterization Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CYN-MW8	Aluminum	ND	0.0193	0.0500	U		122364-008	SW846-3005A/6020B
04-Jun-24	Antimony	ND	0.00100	0.00300	U		122364-008	SW846-3005A/6020B
	Arsenic	ND	0.00200	0.00500	U		122364-008	SW846-3005A/6020B
	Barium	0.0528	0.000670	0.00400			122364-008	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122364-008	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		122364-008	SW846-3005A/6020B
	Calcium	117	0.800	2.00			122364-008	SW846-3005A/6020B
	Chromium	ND	0.00300	0.0100	U		122364-008	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122364-008	SW846-3005A/6020B
	Copper	ND	0.000300	0.00200	U		122364-008	SW846-3005A/6020B
	Iron	ND	0.0330	0.100	U		122364-008	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122364-008	SW846-3005A/6020B
	Magnesium	25.0	0.0100	0.0300			122364-008	SW846-3005A/6020B
	Manganese	ND	0.00100	0.00500	U		122364-008	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U		122364-008	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122364-008	SW846-3005A/6020B
	Potassium	2.20	0.0800	0.300			122364-008	SW846-3005A/6020B
	Selenium	0.00643	0.00150	0.00500			122364-008	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122364-008	SW846-3005A/6020B
	Sodium	45.5	0.0800	0.250			122364-008	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122364-008	SW846-3005A/6020B
	Vanadium	0.00531	0.00330	0.0200	J		122364-008	SW846-3005A/6020B
	Zinc	0.00609	0.00330	0.0200	J		122364-008	SW846-3005A/6020B

See notes at end of tables.

Table 7B-7 (continued)
Summary of Target Analyte List Metals Results for Waste Characterization Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CYN-MW9	Aluminum	ND	0.0193	0.0500	U		122415-008	SW846-3005A/6020B
24-Jun-24	Antimony	ND	0.00100	0.00300	U		122415-008	SW846-3005A/6020B
	Arsenic	ND	0.00200	0.00500	U		122415-008	SW846-3005A/6020B
	Barium	0.0630	0.000670	0.00400			122415-008	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122415-008	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		122415-008	SW846-3005A/6020B
	Calcium	138	0.800	2.00			122415-008	SW846-3005A/6020B
	Chromium	ND	0.00300	0.0100	U		122415-008	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122415-008	SW846-3005A/6020B
	Copper	0.000303	0.000300	0.00200	B, J	0.002U	122415-008	SW846-3005A/6020B
	Iron	ND	0.0330	0.100	U		122415-008	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122415-008	SW846-3005A/6020B
	Magnesium	43.0	0.0100	0.0300			122415-008	SW846-3005A/6020B
	Manganese	ND	0.00100	0.00500	U		122415-008	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U		122415-008	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122415-008	SW846-3005A/6020B
	Potassium	2.37	0.0800	0.300			122415-008	SW846-3005A/6020B
	Selenium	0.00578	0.00150	0.00500			122415-008	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122415-008	SW846-3005A/6020B
	Sodium	34.1	0.0800	0.250			122415-008	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122415-008	SW846-3005A/6020B
	Vanadium	0.00398	0.00330	0.0200	J		122415-008	SW846-3005A/6020B
	Zinc	ND	0.00330	0.0200	U		122415-008	SW846-3005A/6020B

See notes at end of tables.

Table 7B-7 (continued)
Summary of Target Analyte List Metals Results for Waste Characterization Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CYN-MW10	Aluminum	ND	0.0193	0.0500	U		122410-008	SW846-3005A/6020B
13-Jun-24	Antimony	ND	0.00100	0.00300	U		122410-008	SW846-3005A/6020B
	Arsenic	0.00202	0.00200	0.00500	J		122410-008	SW846-3005A/6020B
	Barium	0.0682	0.000670	0.00400			122410-008	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122410-008	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		122410-008	SW846-3005A/6020B
	Calcium	141	0.800	2.00			122410-008	SW846-3005A/6020B
	Chromium	ND	0.00300	0.0100	U		122410-008	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122410-008	SW846-3005A/6020B
	Copper	ND	0.000300	0.00200	U		122410-008	SW846-3005A/6020B
	Iron	ND	0.0330	0.100	U		122410-008	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122410-008	SW846-3005A/6020B
	Magnesium	37.6	0.0100	0.0300			122410-008	SW846-3005A/6020B
	Manganese	ND	0.00100	0.00500	U		122410-008	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U		122410-008	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122410-008	SW846-3005A/6020B
	Potassium	2.02	0.0800	0.300			122410-008	SW846-3005A/6020B
	Selenium	0.00660	0.00150	0.00500			122410-008	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122410-008	SW846-3005A/6020B
	Sodium	38.1	0.0800	0.250			122410-008	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122410-008	SW846-3005A/6020B
	Vanadium	0.00381	0.00330	0.0200	J		122410-008	SW846-3005A/6020B
	Zinc	ND	0.00330	0.0200	U		122410-008	SW846-3005A/6020B

See notes at end of tables.

Table 7B-7 (continued)
Summary of Target Analyte List Metals Results for Waste Characterization Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CYN-MW11	Aluminum	ND	0.0193	0.0500	U		122381-008	SW846-3005A/6020B
12-Jun-24	Antimony	ND	0.00100	0.00300	U		122381-008	SW846-3005A/6020B
	Arsenic	0.00226	0.00200	0.00500	J		122381-008	SW846-3005A/6020B
	Barium	0.0671	0.000670	0.00400			122381-008	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122381-008	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		122381-008	SW846-3005A/6020B
	Calcium	138	0.800	2.00	B		122381-008	SW846-3005A/6020B
	Chromium	ND	0.00300	0.0100	U		122381-008	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122381-008	SW846-3005A/6020B
	Copper	ND	0.000300	0.00200	U		122381-008	SW846-3005A/6020B
	Iron	ND	0.0330	0.100	U		122381-008	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122381-008	SW846-3005A/6020B
	Magnesium	44.3	0.0100	0.0300			122381-008	SW846-3005A/6020B
	Manganese	0.00748	0.00100	0.00500		J+	122381-008	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U		122381-008	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122381-008	SW846-3005A/6020B
	Potassium	3.47	0.0800	0.300			122381-008	SW846-3005A/6020B
	Selenium	0.00571	0.00150	0.00500			122381-008	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122381-008	SW846-3005A/6020B
	Sodium	38.8	0.0800	0.250			122381-008	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122381-008	SW846-3005A/6020B
	Vanadium	ND	0.00330	0.0200	U		122381-008	SW846-3005A/6020B
	Zinc	0.00715	0.00330	0.0200	B, J	0.02U	122381-008	SW846-3005A/6020B

See notes at end of tables.

Table 7B-7 (continued)
Summary of Target Analyte List Metals Results for Waste Characterization Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CYN-MW12 10-Jun-24	Aluminum	ND	0.0193	0.0500	U		122408-008	SW846-3005A/6020B
	Antimony	ND	0.00100	0.00300	U		122408-008	SW846-3005A/6020B
	Arsenic	0.00211	0.00200	0.00500	J		122408-008	SW846-3005A/6020B
	Barium	0.0459	0.000670	0.00400			122408-008	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122408-008	SW846-3005A/6020B
	Cadmium	0.000523	0.000300	0.00100	J		122408-008	SW846-3005A/6020B
	Calcium	232	0.800	2.00	B		122408-008	SW846-3005A/6020B
	Chromium	ND	0.00300	0.0100	U		122408-008	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122408-008	SW846-3005A/6020B
	Copper	0.000558	0.000300	0.00200	J		122408-008	SW846-3005A/6020B
	Iron	ND	0.0330	0.100	U		122408-008	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122408-008	SW846-3005A/6020B
	Magnesium	61.3	0.100	0.300			122408-008	SW846-3005A/6020B
	Manganese	0.00318	0.00100	0.00500	J	J+	122408-008	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U		122408-008	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122408-008	SW846-3005A/6020B
	Potassium	2.95	0.0800	0.300			122408-008	SW846-3005A/6020B
	Selenium	0.0168	0.00150	0.00500			122408-008	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122408-008	SW846-3005A/6020B
	Sodium	50.8	0.800	2.50			122408-008	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122408-008	SW846-3005A/6020B
	Vanadium	ND	0.00330	0.0200	U		122408-008	SW846-3005A/6020B
	Zinc	0.0237	0.00330	0.0200	B		122408-008	SW846-3005A/6020B

See notes at end of tables.

Table 7B-7 (continued)
Summary of Target Analyte List Metals Results for Waste Characterization Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CYN-MW13	Aluminum	ND	0.0193	0.0500	U		122412-008	SW846-3005A/6020B
17-Jun-24	Antimony	0.00120	0.00100	0.00300	J		122412-008	SW846-3005A/6020B
	Arsenic	ND	0.00200	0.00500	U		122412-008	SW846-3005A/6020B
	Barium	0.0873	0.000670	0.00400			122412-008	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122412-008	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		122412-008	SW846-3005A/6020B
	Calcium	107	0.800	2.00			122412-008	SW846-3005A/6020B
	Chromium	ND	0.00300	0.0100	U		122412-008	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122412-008	SW846-3005A/6020B
	Copper	ND	0.000300	0.00200	U		122412-008	SW846-3005A/6020B
	Iron	ND	0.0330	0.100	U		122412-008	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122412-008	SW846-3005A/6020B
	Magnesium	20.0	0.0100	0.0300			122412-008	SW846-3005A/6020B
	Manganese	ND	0.00100	0.00500	U		122412-008	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U		122412-008	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122412-008	SW846-3005A/6020B
	Potassium	1.76	0.0800	0.300			122412-008	SW846-3005A/6020B
	Selenium	0.00442	0.00150	0.00500	J		122412-008	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122412-008	SW846-3005A/6020B
	Sodium	25.8	0.0800	0.250			122412-008	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122412-008	SW846-3005A/6020B
	Vanadium	0.00395	0.00330	0.0200	J		122412-008	SW846-3005A/6020B
	Zinc	0.00395	0.00330	0.0200	J		122412-008	SW846-3005A/6020B

See notes at end of tables.

Table 7B-7 (continued)
Summary of Target Analyte List Metals Results for Waste Characterization Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CYN-MW14A	Aluminum	ND	0.0193	0.0500	U		122401-008	SW846-3005A/6020B
11-Jun-24	Antimony	ND	0.00100	0.00300	U		122401-008	SW846-3005A/6020B
	Arsenic	ND	0.00200	0.00500	U		122401-008	SW846-3005A/6020B
	Barium	0.0394	0.000670	0.00400			122401-008	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122401-008	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		122401-008	SW846-3005A/6020B
	Calcium	141	0.800	2.00	B		122401-008	SW846-3005A/6020B
	Chromium	ND	0.00300	0.0100	U		122401-008	SW846-3005A/6020B
	Cobalt	0.00133	0.000300	0.00100			122401-008	SW846-3005A/6020B
	Copper	0.000490	0.000300	0.00200	J		122401-008	SW846-3005A/6020B
	Iron	ND	0.0330	0.100	U		122401-008	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122401-008	SW846-3005A/6020B
	Magnesium	35.4	0.0100	0.0300			122401-008	SW846-3005A/6020B
	Manganese	0.00177	0.00100	0.00500	J	J+	122401-008	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U		122401-008	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122401-008	SW846-3005A/6020B
	Potassium	2.17	0.0800	0.300			122401-008	SW846-3005A/6020B
	Selenium	0.0117	0.00150	0.00500			122401-008	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122401-008	SW846-3005A/6020B
	Sodium	39.5	0.0800	0.250			122401-008	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122401-008	SW846-3005A/6020B
	Vanadium	ND	0.00330	0.0200	U		122401-008	SW846-3005A/6020B
	Zinc	0.00370	0.00330	0.0200	B, J	0.02U	122401-008	SW846-3005A/6020B

See notes at end of tables.

Table 7B-7 (continued)
Summary of Target Analyte List Metals Results for Waste Characterization Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CYN-MW16 06-Jun-24	Aluminum	ND	0.0193	0.0500	U		122375-008	SW846-3005A/6020B
	Antimony	ND	0.00100	0.00300	U		122375-008	SW846-3005A/6020B
	Arsenic	0.00237	0.00200	0.00500	J		122375-008	SW846-3005A/6020B
	Barium	0.0711	0.000670	0.00400			122375-008	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122375-008	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		122375-008	SW846-3005A/6020B
	Calcium	107	0.800	2.00			122375-008	SW846-3005A/6020B
	Chromium	ND	0.00300	0.0100	U		122375-008	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122375-008	SW846-3005A/6020B
	Copper	ND	0.000300	0.00200	U		122375-008	SW846-3005A/6020B
	Iron	ND	0.0330	0.100	U		122375-008	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122375-008	SW846-3005A/6020B
	Magnesium	20.1	0.0100	0.0300			122375-008	SW846-3005A/6020B
	Manganese	0.00173	0.00100	0.00500	J	J+	122375-008	SW846-3005A/6020B
	Mercury	0.0000820	0.0000670	0.000200	B, J	0.002UJ	122375-008	SW846-7470A
	Nickel	0.000608	0.000600	0.00200	J		122375-008	SW846-3005A/6020B
	Potassium	2.29	0.0800	0.300			122375-008	SW846-3005A/6020B
	Selenium	0.00774	0.00150	0.00500			122375-008	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122375-008	SW846-3005A/6020B
	Sodium	36.4	0.0800	0.250			122375-008	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122375-008	SW846-3005A/6020B
	Vanadium	0.00683	0.00330	0.0200	J		122375-008	SW846-3005A/6020B
	Zinc	ND	0.00330	0.0200	U		122375-008	SW846-3005A/6020B

See notes at end of tables.

Table 7B-7 (continued)
Summary of Target Analyte List Metals Results for Waste Characterization Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CYN-MW17	Aluminum	ND	0.0193	0.0500	U		122343-008	SW846-3005A/6020B
29-May-24	Antimony	ND	0.00100	0.00300	U		122343-008	SW846-3005A/6020B
	Arsenic	ND	0.00200	0.00500	U		122343-008	SW846-3005A/6020B
	Barium	0.0738	0.000670	0.00400			122343-008	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122343-008	SW846-3005A/6020B
	Cadmium	0.000357	0.000300	0.00100	J		122343-008	SW846-3005A/6020B
	Calcium	73.4	0.800	2.00			122343-008	SW846-3005A/6020B
	Chromium	ND	0.00300	0.0100	U		122343-008	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122343-008	SW846-3005A/6020B
	Copper	ND	0.000300	0.00200	U		122343-008	SW846-3005A/6020B
	Iron	0.0466	0.0330	0.100	J		122343-008	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122343-008	SW846-3005A/6020B
	Magnesium	14.8	0.0100	0.0300			122343-008	SW846-3005A/6020B
	Manganese	0.0100	0.00100	0.00500			122343-008	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U		122343-008	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122343-008	SW846-3005A/6020B
	Potassium	1.70	0.0800	0.300			122343-008	SW846-3005A/6020B
	Selenium	0.00495	0.00150	0.00500	J		122343-008	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122343-008	SW846-3005A/6020B
	Sodium	28.9	0.0800	0.250			122343-008	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122343-008	SW846-3005A/6020B
	Vanadium	0.00408	0.00330	0.0200	J		122343-008	SW846-3005A/6020B
	Zinc	ND	0.00330	0.0200	U		122343-008	SW846-3005A/6020B

See notes at end of tables.

Table 7B-7 (continued)
Summary of Target Analyte List Metals Results for Waste Characterization Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CYN-MW18	Aluminum	ND	0.0193	0.0500	U		122369-008	SW846-3005A/6020B
05-Jun-24	Antimony	ND	0.00100	0.00300	U		122369-008	SW846-3005A/6020B
	Arsenic	ND	0.00200	0.00500	U		122369-008	SW846-3005A/6020B
	Barium	0.0377	0.000670	0.00400			122369-008	SW846-3005A/6020B
	Beryllium	0.00190	0.000200	0.000500			122369-008	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		122369-008	SW846-3005A/6020B
	Calcium	117	0.800	2.00			122369-008	SW846-3005A/6020B
	Chromium	ND	0.00300	0.0100	U		122369-008	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122369-008	SW846-3005A/6020B
	Copper	ND	0.000300	0.00200	U		122369-008	SW846-3005A/6020B
	Iron	ND	0.0330	0.100	U		122369-008	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122369-008	SW846-3005A/6020B
	Magnesium	28.9	0.0100	0.0300			122369-008	SW846-3005A/6020B
	Manganese	0.0737	0.00100	0.00500			122369-008	SW846-3005A/6020B
	Mercury	0.0000820	0.0000670	0.000200	B, J	0.0002UJ	122369-008	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122369-008	SW846-3005A/6020B
	Potassium	1.86	0.0800	0.300			122369-008	SW846-3005A/6020B
	Selenium	0.00647	0.00150	0.00500			122369-008	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122369-008	SW846-3005A/6020B
	Sodium	33.6	0.0800	0.250			122369-008	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122369-008	SW846-3005A/6020B
	Vanadium	0.00334	0.00330	0.0200	B, J	0.02U	122369-008	SW846-3005A/6020B
	Zinc	ND	0.00330	0.0200	U		122369-008	SW846-3005A/6020B

See notes at end of tables.

Table 7B-7 (concluded)
Summary of Target Analyte List Metals Results for Waste Characterization Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Result[a] (mg/L)	MDL[b] (mg/L)	PQL[c] (mg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CYN-MW19	Aluminum	ND	0.0193	0.0500	U		122355-008	SW846-3005A/6020B
03-Jun-24	Antimony	ND	0.00100	0.00300	U		122355-008	SW846-3005A/6020B
	Arsenic	ND	0.00200	0.00500	U		122355-008	SW846-3005A/6020B
	Barium	0.0559	0.000670	0.00400			122355-008	SW846-3005A/6020B
	Beryllium	ND	0.000200	0.000500	U		122355-008	SW846-3005A/6020B
	Cadmium	ND	0.000300	0.00100	U		122355-008	SW846-3005A/6020B
	Calcium	105	0.800	2.00			122355-008	SW846-3005A/6020B
	Chromium	ND	0.00300	0.0100	U		122355-008	SW846-3005A/6020B
	Cobalt	ND	0.000300	0.00100	U		122355-008	SW846-3005A/6020B
	Copper	0.000451	0.000300	0.00200	J		122355-008	SW846-3005A/6020B
	Iron	ND	0.0330	0.100	U		122355-008	SW846-3005A/6020B
	Lead	ND	0.000500	0.00200	U		122355-008	SW846-3005A/6020B
	Magnesium	31.5	0.0100	0.0300			122355-008	SW846-3005A/6020B
	Manganese	ND	0.00100	0.00500	U		122355-008	SW846-3005A/6020B
	Mercury	ND	0.0000670	0.000200	U		122355-008	SW846-7470A
	Nickel	ND	0.000600	0.00200	U		122355-008	SW846-3005A/6020B
	Potassium	1.82	0.0800	0.300			122355-008	SW846-3005A/6020B
	Selenium	0.00718	0.00150	0.00500			122355-008	SW846-3005A/6020B
	Silver	ND	0.000300	0.00100	U		122355-008	SW846-3005A/6020B
	Sodium	24.0	0.0800	0.250			122355-008	SW846-3005A/6020B
	Thallium	ND	0.000600	0.00200	U		122355-008	SW846-3005A/6020B
	Vanadium	0.00466	0.00330	0.0200	J		122355-008	SW846-3005A/6020B
	Zinc	ND	0.00330	0.0200	U		122355-008	SW846-3005A/6020B

See notes at end of tables.

Table 7B-8
Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, Isotopic Uranium, and Tritium Results for Waste Characterization Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Activity[a] (pCi/L)	MDA[b] (pCi/L)	Critical Level[c] (pCi/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CYN-MW4	Americium-241	-2.39 ± 8.31	14.5	6.98	U	BD	122326-009	EPA 901.1
28-May-24	Cesium-137	0.390 ± 1.54	2.75	1.30	U	BD	122326-009	EPA 901.1
	Cobalt-60	0.0296 ± 1.61	2.98	1.37	U	BD	122326-009	EPA 901.1
	Potassium-40	39.0 ± 46.2	30.8	14.1		J	122326-009	EPA 901.1
	Gross Alpha	-7.25	NA	NA	NA	None	122326-010	EPA 900.0
	Gross Beta	12.1 ± 1.40	1.61	0.784			122326-010	EPA 900.0
	Uranium-233/234	28.0 ± 3.84	0.190	0.0819			122326-011	HASL-300
	Uranium-235/236	0.365 ± 0.142	0.234	0.101		J	122326-011	HASL-300
	Uranium-238	3.58 ± 0.599	0.219	0.0966			122326-011	HASL-300
	Tritium	14.3 ± 82.2	155	66.9	U	BD	122326-012	EPA 906.0M
CYN-MW7	Americium-241	-22.9 ± 24.1	27.0	13.0	U	BD	122350-009	EPA 901.1
30-May-24	Cesium-137	0.693 ± 4.17	3.23	1.51	U	BD	122350-009	EPA 901.1
	Cobalt-60	1.45 ± 5.15	4.87	2.27	U	BD	122350-009	EPA 901.1
	Potassium-40	34.2 ± 48.0	31.5	14.0		J	122350-009	EPA 901.1
	Gross Alpha	-1.85	NA	NA	NA	None	122350-R10	EPA 900.0
	Gross Beta	6.02 ± 0.933	1.22	0.589			122350-R10	EPA 900.0
	Uranium-233/234	16.6 ± 2.15	0.158	0.0679			122350-011	HASL-300
	Uranium-235/236	0.268 ± 0.111	0.194	0.0837		J	122350-011	HASL-300
	Uranium-238	1.88 ± 0.333	0.182	0.0801			122350-011	HASL-300
	Tritium	-30.1 ± 82.6	169	73.4	U	BD	122350-012	EPA 906.0M
CYN-MW8	Americium-241	-2.44 ± 12.8	22.2	10.8	U	BD	122364-009	EPA 901.1
04-Jun-24	Cesium-137	1.68 ± 5.40	3.96	1.88	U	BD	122364-009	EPA 901.1
	Cobalt-60	0.826 ± 2.39	4.34	2.01	U	BD	122364-009	EPA 901.1
	Potassium-40	-17.2 ± 52.5	73.8	35.3	U	BD	122364-009	EPA 901.1
	Gross Alpha	2.49	NA	NA	NA	None	122364-010	EPA 900.0
	Gross Beta	9.56 ± 1.56	2.18	1.06			122364-010	EPA 900.0
	Uranium-233/234	21.9 ± 2.29	0.0848	0.0369			122364-011	HASL-300
	Uranium-235/236	0.178 ± 0.0636	0.105	0.0455		J	122364-011	HASL-300
	Uranium-238	2.33 ± 0.304	0.0981	0.0435			122364-011	HASL-300
	Tritium	-1.97 ± 83.2	162	70.1	U	BD	122364-012	EPA 906.0M

See notes at end of tables.

Table 7B-8 (continued)
Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, Isotopic Uranium, and Tritium Results for Waste Characterization Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Activity[a] (pCi/L)	MDA[b] (pCi/L)	Critical Level[c] (pCi/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CYN-MW9	Americium-241	-7.30 ± 13.9	20.6	9.94	U	BD	122415-009	EPA 901.1
24-Jun-24	Cesium-137	1.10 ± 3.37	3.55	1.67	U	BD	122415-009	EPA 901.1
	Cobalt-60	-0.703 ± 3.50	4.36	2.02	U	BD	122415-009	EPA 901.1
	Potassium-40	11.5 ± 70.1	35.9	16.3	U	BD	122415-009	EPA 901.1
	Gross Alpha	10.4	NA	NA	NA	None	122415-010	EPA 900.0
	Gross Beta	-4.34 ± 7.84	14.0	6.71	U	BD	122415-010	EPA 900.0
	Uranium-233/234	8.95 ± 0.837	0.0555	0.0247			122415-011	HASL-300
	Uranium-235/236	0.200 ± 0.0496	0.0416	0.0171			122415-011	HASL-300
	Uranium-238	2.35 ± 0.251	0.0428	0.0184			122415-011	HASL-300
	Tritium	-49.7 ± 85.2	153	73.4	U	BD	122415-012	EPA 906.0M
CYN-MW10	Americium-241	10.7 ± 19.0	28.1	13.7	U	BD	122410-009	EPA 901.1
13-Jun-24	Cesium-137	-3.25 ± 5.26	4.17	1.99	U	BD	122410-009	EPA 901.1
	Cobalt-60	-1.09 ± 3.56	4.12	1.92	U	BD	122410-009	EPA 901.1
	Potassium-40	-22.2 ± 38.4	44.3	20.7	U	BD	122410-009	EPA 901.1
	Gross Alpha	-1.67	NA	NA	NA	None	122410-010	EPA 900.0
	Gross Beta	5.30 ± 1.53	2.37	1.15		J	122410-010	EPA 900.0
	Uranium-233/234	6.04 ± 0.604	0.0666	0.0297			122410-011	HASL-300
	Uranium-235/236	0.279 ± 0.0652	0.0499	0.0205			122410-011	HASL-300
	Uranium-238	2.17 ± 0.248	0.0514	0.0221			122410-011	HASL-300
	Tritium	-3.45 ± 107	185	89.5	U	BD	122410-012	EPA 906.0M
CYN-MW11	Americium-241	-0.150 ± 8.20	13.3	6.42	U	BD	122381-009	EPA 901.1
12-Jun-24	Cesium-137	1.36 ± 2.02	3.22	1.52	U	BD	122381-009	EPA 901.1
	Cobalt-60	0.772 ± 1.64	3.15	1.43	U	BD	122381-009	EPA 901.1
	Potassium-40	44.9 ± 56.3	35.2	16.1		J	122381-009	EPA 901.1
	Gross Alpha	-0.07	NA	NA	NA	None	122381-010	EPA 900.0
	Gross Beta	3.87 ± 1.55	2.49	1.21		J	122381-010	EPA 900.0
	Uranium-233/234	5.20 ± 0.567	0.0765	0.0336			122381-011	HASL-300
	Uranium-235/236	0.0682 ± 0.0361	0.0943	0.0414	U	BD	122381-011	HASL-300
	Uranium-238	1.29 ± 0.182	0.0885	0.0396			122381-011	HASL-300
	Tritium	-8.62 ± 107	187	90.4	U	BD	122381-012	EPA 906.0M

See notes at end of tables.

Table 7B-8 (continued)
Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, Isotopic Uranium, and Tritium Results for Waste Characterization Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Activity[a] (pCi/L)	MDA[b] (pCi/L)	Critical Level[c] (pCi/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CYN-MW12	Americium-241	-4.88 ± 17.3	25.7	12.5	U	BD	122408-009	EPA 901.1
10-Jun-24	Cesium-137	2.03 ± 6.31	3.66	1.72	U	BD	122408-009	EPA 901.1
	Cobalt-60	-1.76 ± 2.64	4.28	1.97	U	BD	122408-009	EPA 901.1
	Potassium-40	-28.5 ± 59.1	58.8	27.6	U	BD	122408-009	EPA 901.1
	Gross Alpha	0.39	NA	NA	NA	None	122408-010	EPA 900.0
	Gross Beta	4.57 ± 1.45	2.17	1.05		J	122408-010	EPA 900.0
	Uranium-233/234	12.9 ± 1.41	0.0906	0.0394			122408-011	HASL-300
	Uranium-235/236	0.165 ± 0.0644	0.112	0.0485		J	122408-011	HASL-300
	Uranium-238	2.75 ± 0.356	0.105	0.0464			122408-011	HASL-300
	Tritium	-11.0 ± 107	186	90.4	U	BD	122408-012	EPA 906.0M
CYN-MW13	Americium-241	2.06 ± 7.26	11.9	5.74	U	BD	122412-009	EPA 901.1
17-Jun-24	Cesium-137	-1.36 ± 3.19	3.44	1.62	U	BD	122412-009	EPA 901.1
	Cobalt-60	0.106 ± 1.67	3.11	1.41	U	BD	122412-009	EPA 901.1
	Potassium-40	3.17 ± 44.8	34.0	15.5	U	BD	122412-009	EPA 901.1
	Gross Alpha	0.27	NA	NA	NA	None	122412-010	EPA 900.0
	Gross Beta	2.91 ± 0.883	1.30	0.621		J	122412-010	EPA 900.0
	Uranium-233/234	9.15 ± 0.847	0.0533	0.0238			122412-011	HASL-300
	Uranium-235/236	0.200 ± 0.0487	0.0399	0.0164			122412-011	HASL-300
	Uranium-238	1.38 ± 0.161	0.0411	0.0177			122412-011	HASL-300
	Tritium	20.4 ± 114	200	94.8	U	BD	122412-012	EPA 906.0M
CYN-MW14A	Americium-241	-0.400 ± 5.15	9.08	4.43	U	BD	122401-009	EPA 901.1
11-Jun-24	Cesium-137	0.393 ± 1.99	3.23	1.53	U	BD	122401-009	EPA 901.1
	Cobalt-60	1.97 ± 2.31	3.69	1.72	U	BD	122401-009	EPA 901.1
	Potassium-40	-21.5 ± 36.9	49.5	23.5	U	BD	122401-009	EPA 901.1
	Gross Alpha	-1.73	NA	NA	NA	None	122401-010	EPA 900.0
	Gross Beta	3.33 ± 1.51	2.41	1.17		J	122401-010	EPA 900.0
	Uranium-233/234	11.1 ± 1.31	0.118	0.0518		J+	122401-011	HASL-300
	Uranium-235/236	0.224 ± 0.0852	0.146	0.0639		J+	122401-011	HASL-300
	Uranium-238	2.51 ± 0.360	0.137	0.0611		J+	122401-011	HASL-300
	Tritium	-34.7 ± 106	185	89.8	U	BD	122401-012	EPA 906.0M

See notes at end of tables.

Table 7B-8 (continued)
Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, Isotopic Uranium, and Tritium Results for Waste Characterization Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Activity[a] (pCi/L)	MDA[b] (pCi/L)	Critical Level[c] (pCi/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CYN-MW16	Americium-241	-0.746 ± 8.90	14.7	7.06	U	BD	122375-009	EPA 901.1
06-Jun-24	Cesium-137	-0.0976 ± 1.48	2.62	1.23	U	BD	122375-009	EPA 901.1
	Cobalt-60	-0.532 ± 1.84	2.85	1.30	U	BD	122375-009	EPA 901.1
	Potassium-40	47.5 ± 47.1	25.0	11.2		J	122375-009	EPA 901.1
	Gross Alpha	-2.25	NA	NA	NA	None	122375-010	EPA 900.0
	Gross Beta	4.83 ± 1.83	2.94	1.44		J	122375-010	EPA 900.0
	Uranium-233/234	8.78 ± 0.964	0.0838	0.0364			122375-011	HASL-300
	Uranium-235/236	0.126 ± 0.0533	0.103	0.0449		J	122375-011	HASL-300
	Uranium-238	1.57 ± 0.223	0.0968	0.0430			122375-011	HASL-300
	Tritium	-65.1 ± 99.1	182	86.3	U	BD	122375-012	EPA 906.0M
CYN-MW17	Americium-241	4.69 ± 12.9	23.0	11.1	U	BD	122343-009	EPA 901.1
29-May-24	Cesium-137	-1.05 ± 1.65	2.66	1.24	U	BD	122343-009	EPA 901.1
	Cobalt-60	-1.74 ± 2.14	2.79	1.25	U	BD	122343-009	EPA 901.1
	Potassium-40	-4.70 ± 43.5	50.6	23.9	U	BD	122343-009	EPA 901.1
	Gross Alpha	1.15	NA	NA	NA	None	122343-010	EPA 900.0
	Gross Beta	4.34 ± 0.753	1.03	0.495			122343-010	EPA 900.0
	Uranium-233/234	5.18 ± 0.606	0.0951	0.0418			122343-011	HASL-300
	Uranium-235/236	0.0742 ± 0.0447	0.117	0.0515	U	BD	122343-011	HASL-300
	Uranium-238	1.03 ± 0.169	0.110	0.0492			122343-011	HASL-300
	Tritium	13.8 ± 88.1	165	72.1	U	BD	122343-012	EPA 906.0M
CYN-MW18	Americium-241	5.48 ± 15.4	24.3	11.8	U	BD	122369-009	EPA 901.1
05-Jun-24	Cesium-137	-0.712 ± 2.08	3.65	1.73	U	BD	122369-009	EPA 901.1
	Cobalt-60	0.0833 ± 2.29	4.07	1.87	U	BD	122369-009	EPA 901.1
	Potassium-40	-18.7 ± 50.9	56.1	26.4	U	BD	122369-009	EPA 901.1
	Gross Alpha	1.67	NA	NA	NA	None	122369-010	EPA 900.0
	Gross Beta	5.97 ± 1.29	1.89	0.915			122369-010	EPA 900.0
	Uranium-233/234	6.37 ± 0.745	0.0970	0.0422			122369-011	HASL-300
	Uranium-235/236	0.0998 ± 0.0517	0.120	0.0520	U	BD	122369-011	HASL-300
	Uranium-238	1.47 ± 0.224	0.112	0.0497			122369-011	HASL-300
	Tritium	38.4 ± 92.0	165	71.9	U	BD	122369-012	EPA 906.0M

See notes at end of tables.

Table 7B-8 (concluded)
Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, Isotopic Uranium, and Tritium Results for Waste Characterization Samples, Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Analyte	Activity[a] (pCi/L)	MDA[b] (pCi/L)	Critical Level[c] (pCi/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Sample No.	Analytical Method[g]
CYN-MW19	Americium-241	-1.15 ± 13.9	23.5	11.3	U	BD	122355-009	EPA 901.1
03-Jun-24	Cesium-137	1.07 ± 2.22	3.95	1.87	U	BD	122355-009	EPA 901.1
	Cobalt-60	1.97 ± 2.45	4.57	2.11	U	BD	122355-009	EPA 901.1
	Potassium-40	11.5 ± 62.7	40.9	18.7	U	BD	122355-009	EPA 901.1
	Gross Alpha	-0.93	NA	NA	NA	None	122355-010	EPA 900.0
	Gross Beta	4.13 ± 1.13	1.69	0.818		J	122355-010	EPA 900.0
	Uranium-233/234	5.52 ± 0.656	0.0989	0.0434		J+	122355-011	HASL-300
	Uranium-235/236	0.198 ± 0.0714	0.122	0.0535		J+	122355-011	HASL-300
	Uranium-238	2.02 ± 0.283	0.114	0.0512		J+	122355-011	HASL-300
	Tritium	-1.63 ± 75.5	148	63.6	U	BD	122355-012	EPA 906.0M

See notes at end of tables.

Table 7B-9
Summary of Field Water Quality Parameter Measurements[h], Burn Site Groundwater Monitoring, Sandia National Laboratories, New Mexico, Calendar Year 2024

Well ID	Sample Date	Temperature (°C)	Specific Conductivity (µmho/cm)	Oxidation Reduction Potential (mV)	pH	Turbidity (NTU)	Dissolved Oxygen (% Sat)	Dissolved Oxygen (mg/L)
CYN-MW4	28-May-24	20.01	730.89	83.1	7.40	0.27	56.02	4.04
CYN-MW7	30-May-24	20.25	786.57	93.6	7.19	0.49	68.39	4.93
CYN-MW8	04-Jun-24	19.91	870.34	84.6	7.28	0.23	80.83	5.91
CYN-MW9	24-Jun-24	20.98	1117.4	84.0	6.97	0.85	61.24	4.43
CYN-MW10	13-Jun-24	19.19	1131.2	100.2	7.44	0.34	79.89	5.85
CYN-MW11	12-Jun-24	19.28	1135.9	75.9	7.37	0.33	6.95	0.50
CYN-MW12	10-Jun-24	17.22	1601.8	89.9	7.03	0.05	23.74	1.86
CYN-MW13	17-Jun-24	19.75	792.07	90.9	7.35	0.15	54.62	4.02
CYN-MW14A	11-Jun-24	19.91	1069.0	92.2	7.29	0.30	36.93	2.67
CYN-MW16	06-Jun-24	20.04	772.63	74.2	7.33	0.21	22.26	1.64
CYN-MW17	29-May-24	18.85	599.05	76.2	7.10	0.40	50.28	3.74
CYN-MW18	05-Jun-24	20.22	921.97	76.3	6.94	0.28	13.85	1.02
CYN-MW19	03-Jun-24	18.75	787.61	79.8	7.50	0.18	84.50	6.38
CYN-MW4	29-Oct-24	17.41	737.91	153.9	7.41	0.14	55.12	4.13
CYN-MW7	25-Nov-24	19.03	815.07	85.4	7.12	0.23	71.94	5.32
CYN-MW8	14-Nov-24	18.75	905.74	89.2	7.26	0.29	55.26	4.42
CYN-MW9	31-Oct-24	15.21	1128.8	206.1	7.01	1.04	51.42	4.21
CYN-MW10	30-Oct-24	15.54	1164.4	160.2	7.42	0.30	65.85	5.44
CYN-MW11	12-Nov-24	16.83	1133.5	102.4	7.31	0.14	13.77	1.05
CYN-MW12	28-Oct-24	19.64	1647.8	192.4	6.98	0.50	20.69	1.50
CYN-MW13	30-Oct-24	16.93	779.42	211.3	7.30	0.18	47.65	4.00
CYN-MW14A	23-Oct-24	18.90	1049.8	196.0	7.28	0.38	26.07	2.13
CYN-MW16	22-Oct-24	19.19	790.11	201.8	7.34	0.32	20.77	1.54
CYN-MW17	29-Oct-24	17.78	606.42	107.3	7.11	0.20	50.22	3.75
CYN-MW18	13-Nov-24	17.92	936.87	158.9	6.88	0.20	10.67	0.80
CYN-MW19	21-Oct-24	16.65	806.25	214.8	7.58	0.43	78.46	6.09

See notes at end of tables.

Notes for Burn Site Groundwater Area of Concern Analytical Results Tables

%	= percent
$CaCO_3$	= calcium carbonate
CFR	= Code of Federal Regulations
EPA	= U.S. Environmental Protection Agency
HMX	= octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
ID	= identifier
µg/L	= micrograms per liter
mg/L	= milligrams per liter
No.	= number
pCi/L	= picocuries per liter
RDX	= hexahydro-1,3,5-trinitro-1,3,5-triazine
Tetryl	= methyl-2,4,6-trinitrophenylnitramine

[a]Result or Activity

Result applies to Tables 7B-1 and 7B-4 through 7B-7. Activity applies to Table 7B-8.

Activity	= Gross alpha activity measurements were corrected by subtracting the total uranium activity (40 CFR Part 141). Activities of zero or less are considered to be not detected.
Bold	= Value exceeded the established MCL.
ND	= not detected (at MDL)

[b]MDL or MDA

The MDL applies to Tables 7B-1 through 7B-7. MDA applies to Table 7B-8.

MDA	= The minimal detectable activity or minimum measured activity in a sample required to ensure a 95% probability that the measured activity is accurately quantified above the critical level.
MDL	= Method detection limit. The minimum concentration or activity that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix specific.
NA	= Not applicable for gross alpha activities. The MDA could not be calculated as the gross alpha activity was corrected by subtracting the total uranium activity.

[c]PQL or Critical Level

The PQL applies to Tables 7B-1 and 7B-4 through 7B-7. Critical level applies to Table 7B-8.

Critical Level	= The minimum activity that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix specific.
NA	= Not applicable for gross alpha activities. The critical level could not be calculated as the gross alpha activity was corrected by subtracting the total uranium activity.
PQL	= Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.

[d]MCL

MCL	= Maximum contaminant level. Established by the EPA Office of Water, National Primary Drinking Water Standards (EPA, March 2018).
NE	= not established

[e]Laboratory Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

B	= The analyte was detected in the blank above the effective MDL.
h	= Prep holding time exceeded.
J	= Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL.
N	= Results associated with a spike analysis that was outside control limits.
NA	= not applicable
U	= Analyte is absent or below the method detection limit.
*	= Recovery or percent relative percent difference not within acceptance limits and/or spike amount not compatible with the sample or the duplicate relative percent differences are not applicable where the concentration falls below the effective practical quantitation limit.

[f]Validation Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

BD	= Below detection limit as used in radiochemistry to identify results that are not statistically different from zero.
J	= The associated value is an estimated quantity.
J+	= The associated numerical value is an estimated quantity with a suspected positive bias.
None	= No data validation for corrected gross alpha activity.
U	= The analyte was analyzed for but was not detected. The associated numerical value is the sample quantitation limit.
UJ	= The analyte was analyzed for but was not detected. The associated numerical value is an estimate and may be inaccurate or imprecise.

Notes for Burn Site Groundwater Area of Concern Analytical Results Tables (concluded)

[g]Analytical Method

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HASL	= Health and Safety Laboratory
SM	= Standard Method
SW	= Solid Waste

[h]Field Water Quality Parameter Measurements

Field measurements collected prior to sampling.

°C	= degrees Celsius
% Sat	= percent saturation
µmho/cm	= micromhos per centimeter
mg/L	= milligrams per liter
mV	= millivolts
NTU	= nephelometric turbidity units
pH	= potential of hydrogen (negative logarithm of the hydrogen ion concentration)

Attachment 7C
Burn Site Groundwater Area of Concern Plots

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Attachment 7C Plots

Figure 7C-1 Nitrate plus Nitrite Concentrations, CYN-MW9 ..... 7C-5
Figure 7C-2 Nitrate plus Nitrite Concentrations, CYN-MW10 ..... 7C-6
Figure 7C-3 Nitrate plus Nitrite Concentrations, CYN-MW12 ..... 7C-7
Figure 7C-4 Nitrate plus Nitrite Concentrations, CYN-MW13 ..... 7C-8
Figure 7C-5 Nitrate plus Nitrite Concentrations, CYN-MW14A 7C-9

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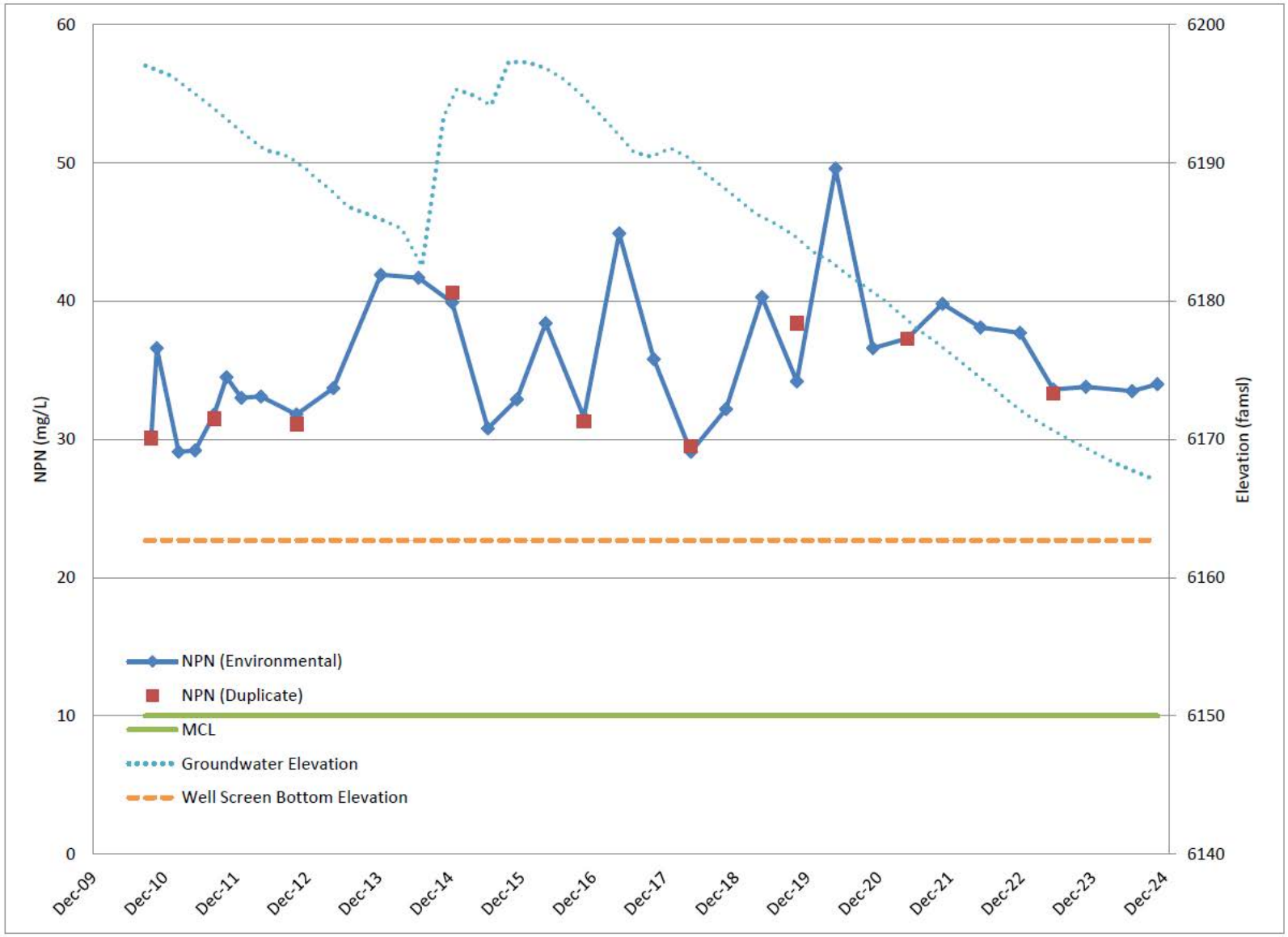


Figure 7C-1
Nitrate plus Nitrite Concentrations, CYN-MW9

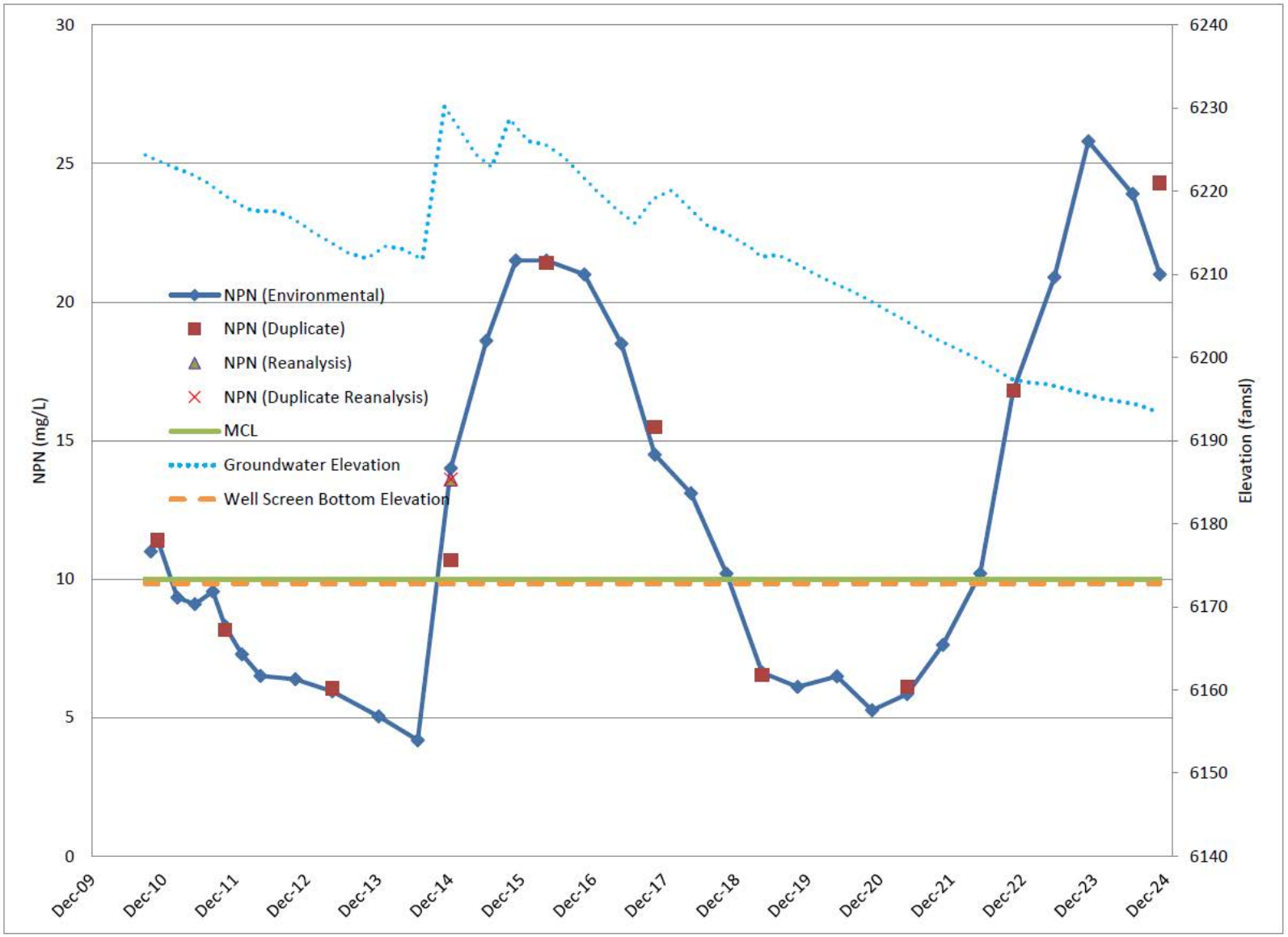


Figure 7C-2
Nitrate plus Nitrite Concentrations, CYN-MW10

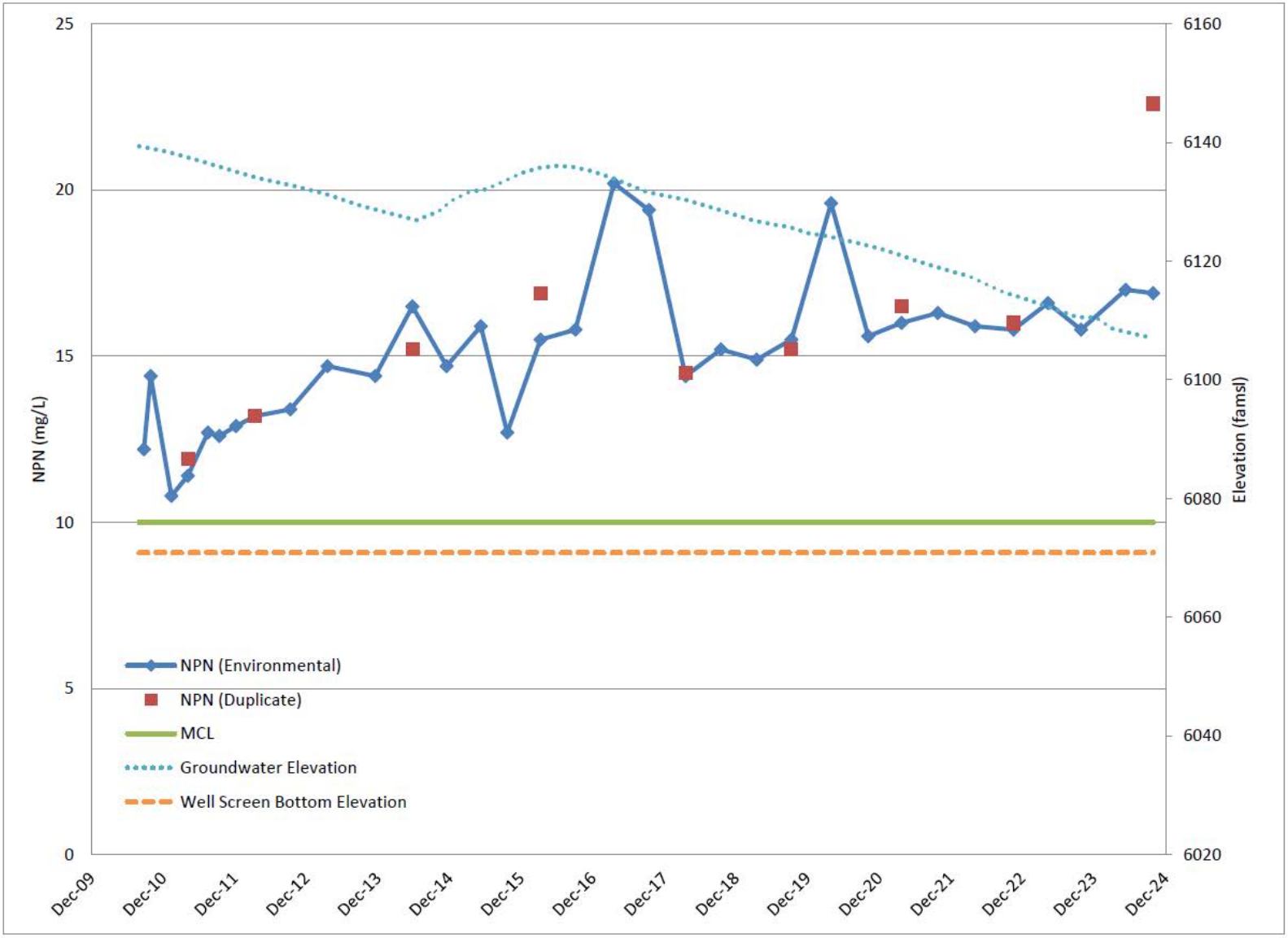


Figure 7C-3
Nitrate plus Nitrite Concentrations, CYN-MW12

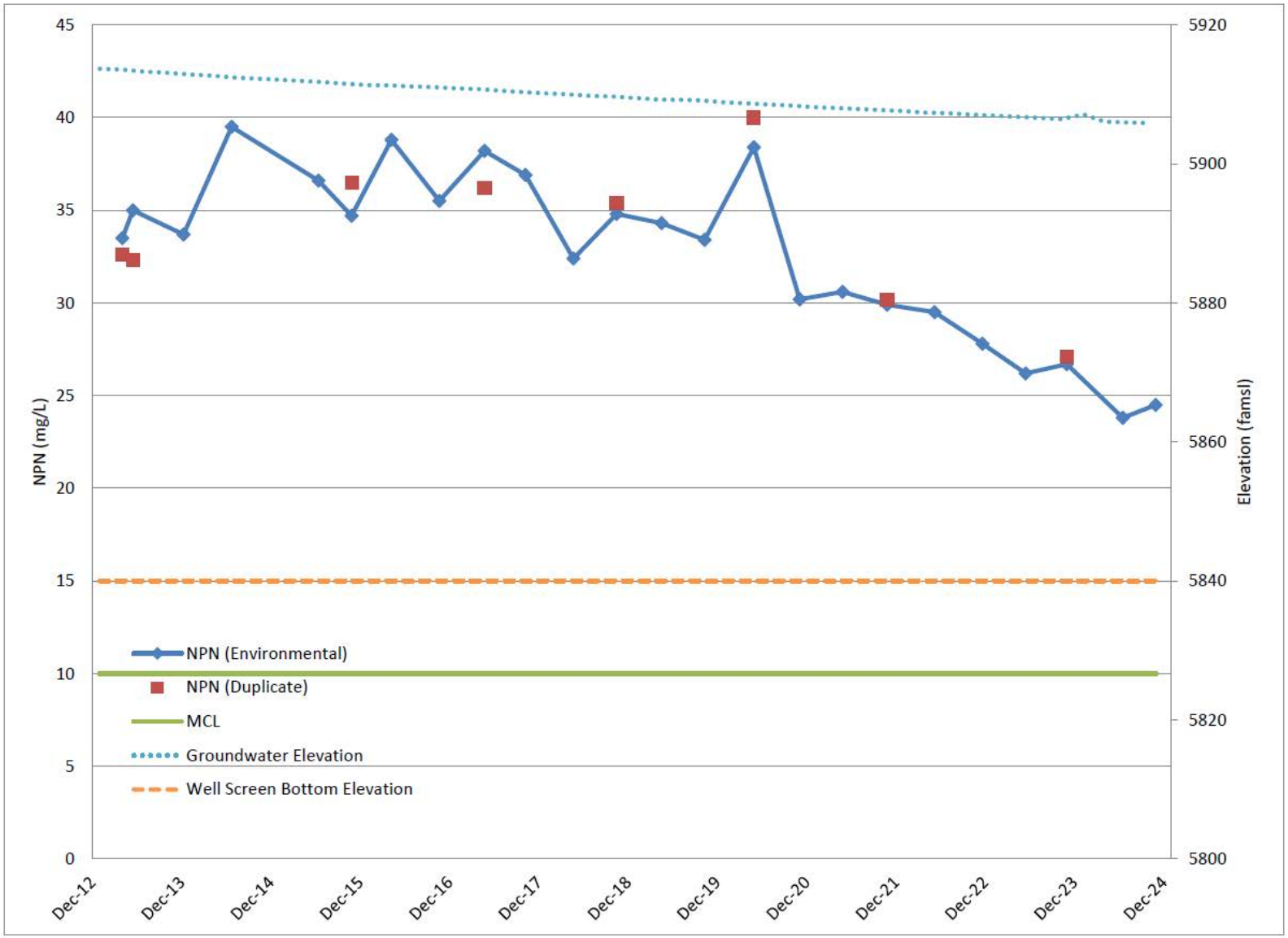


Figure 7C-4
Nitrate plus Nitrite Concentrations, CYN-MW13

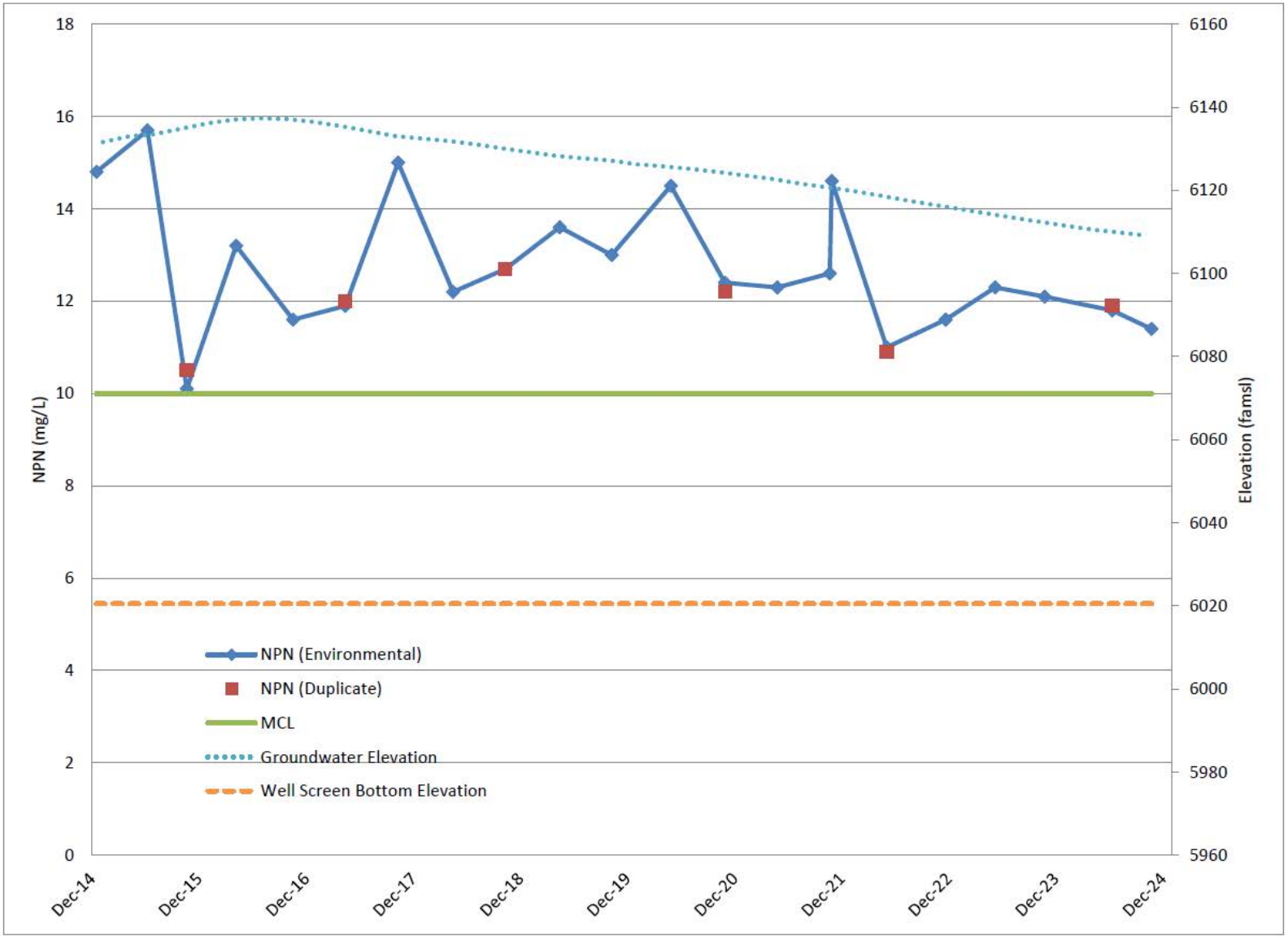


Figure 7C-5
Nitrate plus Nitrite Concentrations, CYN-MW14A

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Attachment 7D
Burn Site Groundwater Area of Concern Hydrographs

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Attachment 7D Hydrographs

Figure 7D-1 Burn Site Groundwater Area of Concern Wells (1 of 9) 7D-5
Figure 7D-2 Burn Site Groundwater Area of Concern Wells (2 of 9) 7D-6
Figure 7D-3 Burn Site Groundwater Area of Concern Wells (3 of 9) 7D-7
Figure 7D-4 Burn Site Groundwater Area of Concern Wells (4 of 9) 7D-8
Figure 7D-5 Burn Site Groundwater Area of Concern Wells (5 of 9) 7D-9
Figure 7D-6 Burn Site Groundwater Area of Concern Wells (6 of 9) 7D-10
Figure 7D-7 Burn Site Groundwater Area of Concern Wells (7 of 9) 7D-11
Figure 7D-8 Burn Site Groundwater Area of Concern Wells (8 of 9) 7D-12
Figure 7D-9 Burn Site Groundwater Area of Concern Wells (9 of 9) 7D-13

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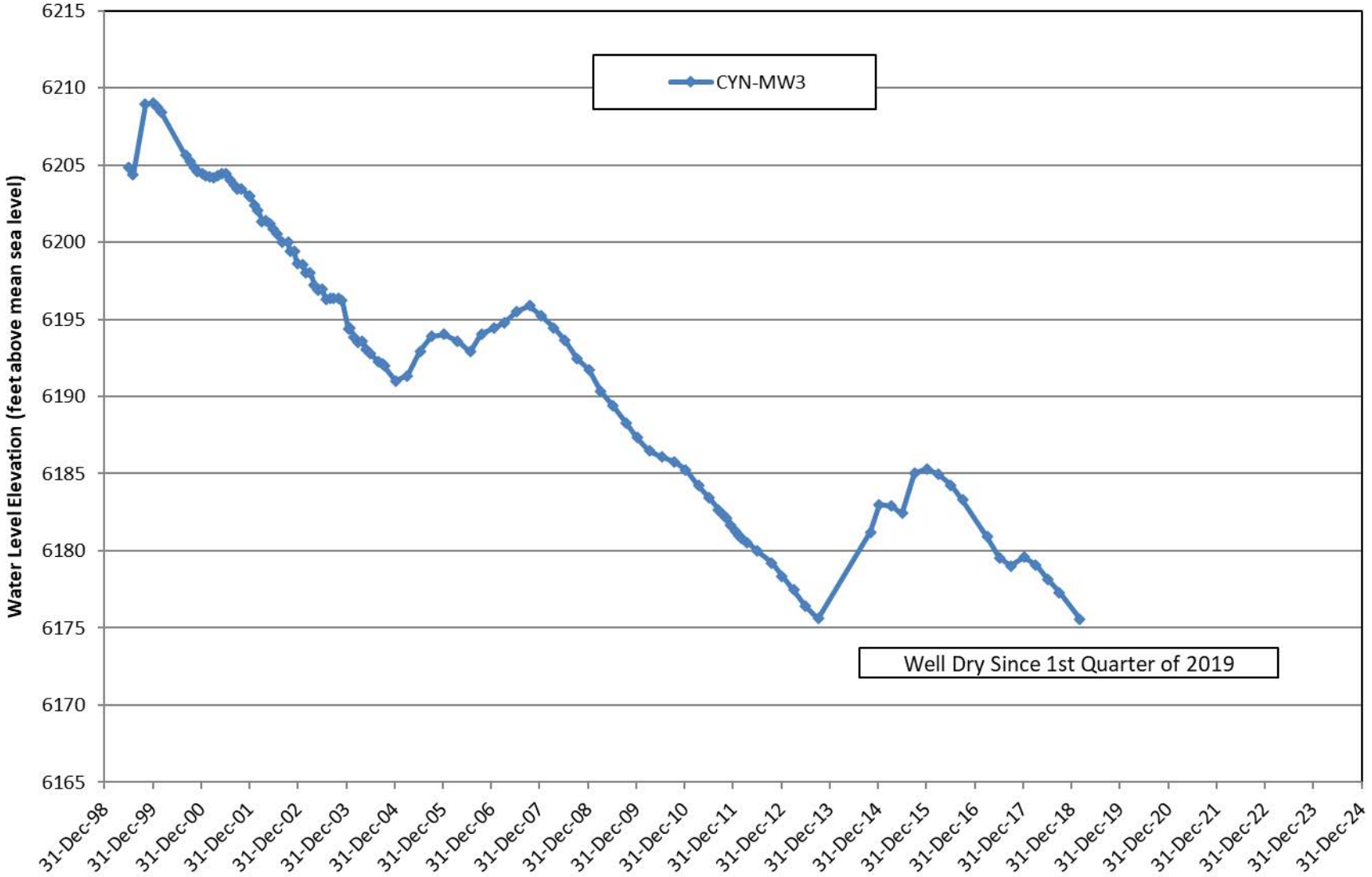


Figure 7D-1
Burn Site Groundwater Area of Concern Wells (1 of 9)

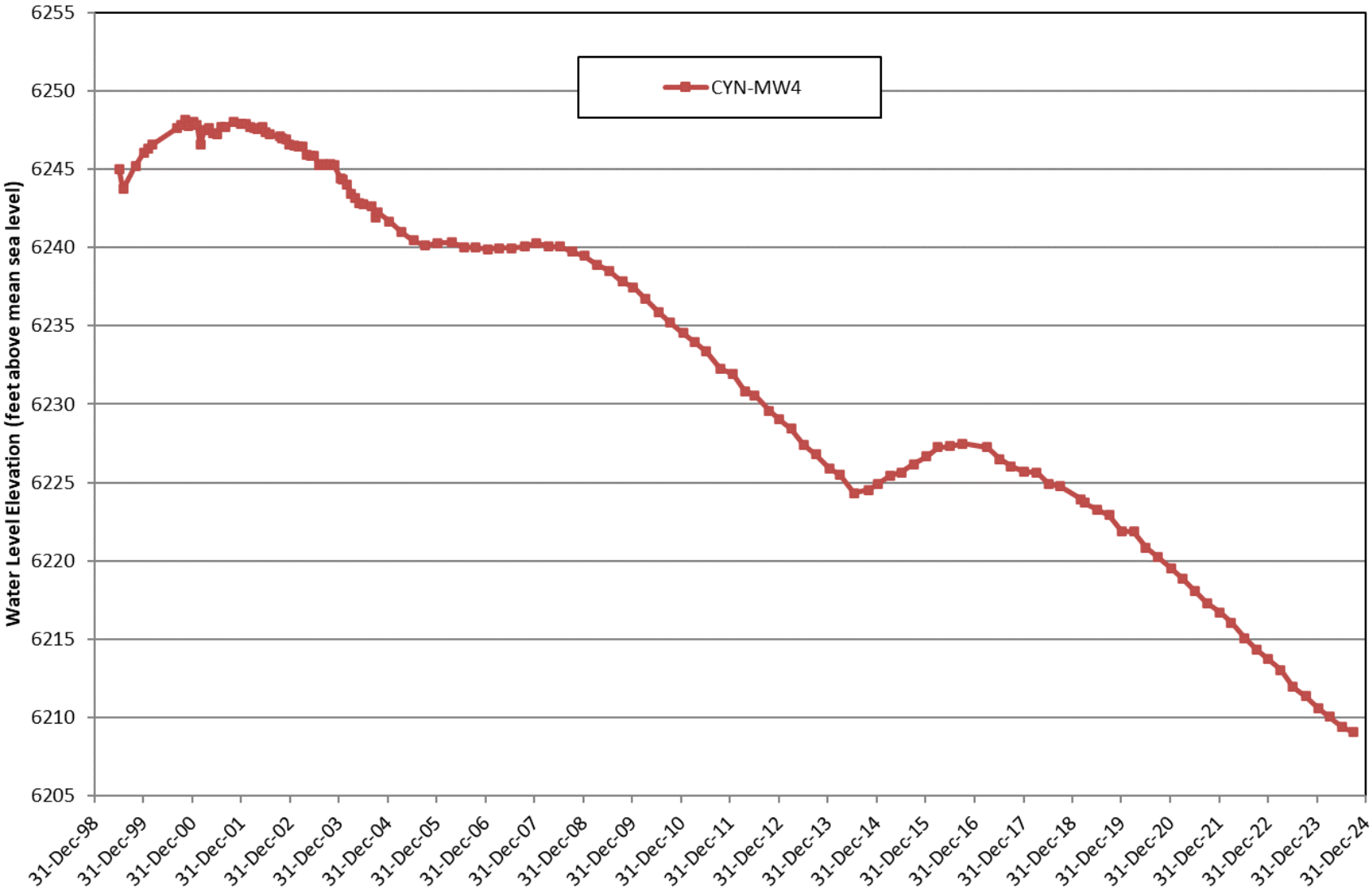


Figure 7D-2
Burn Site Groundwater Area of Concern Wells (2 of 9)

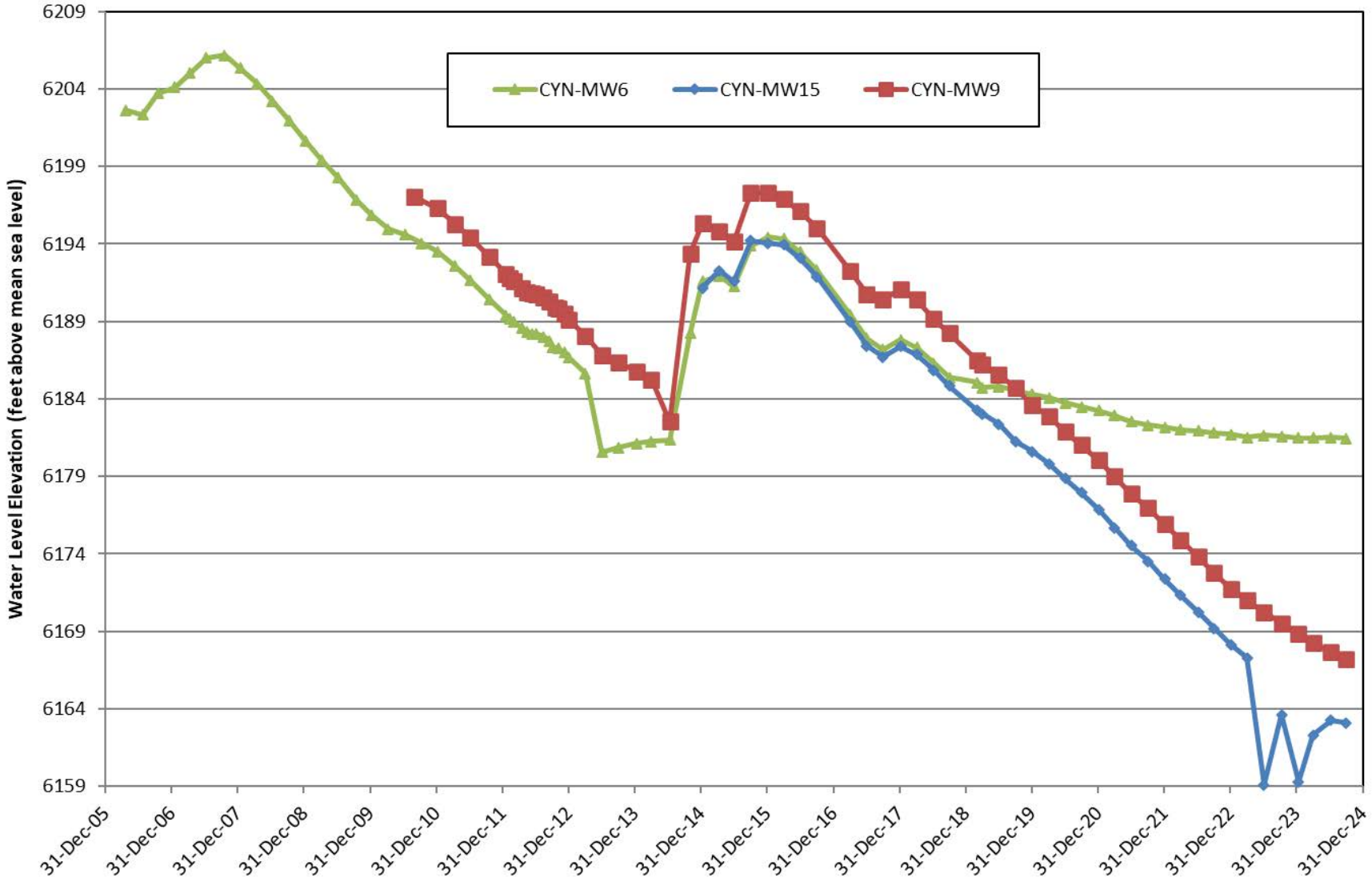


Figure 7D-3
Burn Site Groundwater Area of Concern Wells (3 of 9)

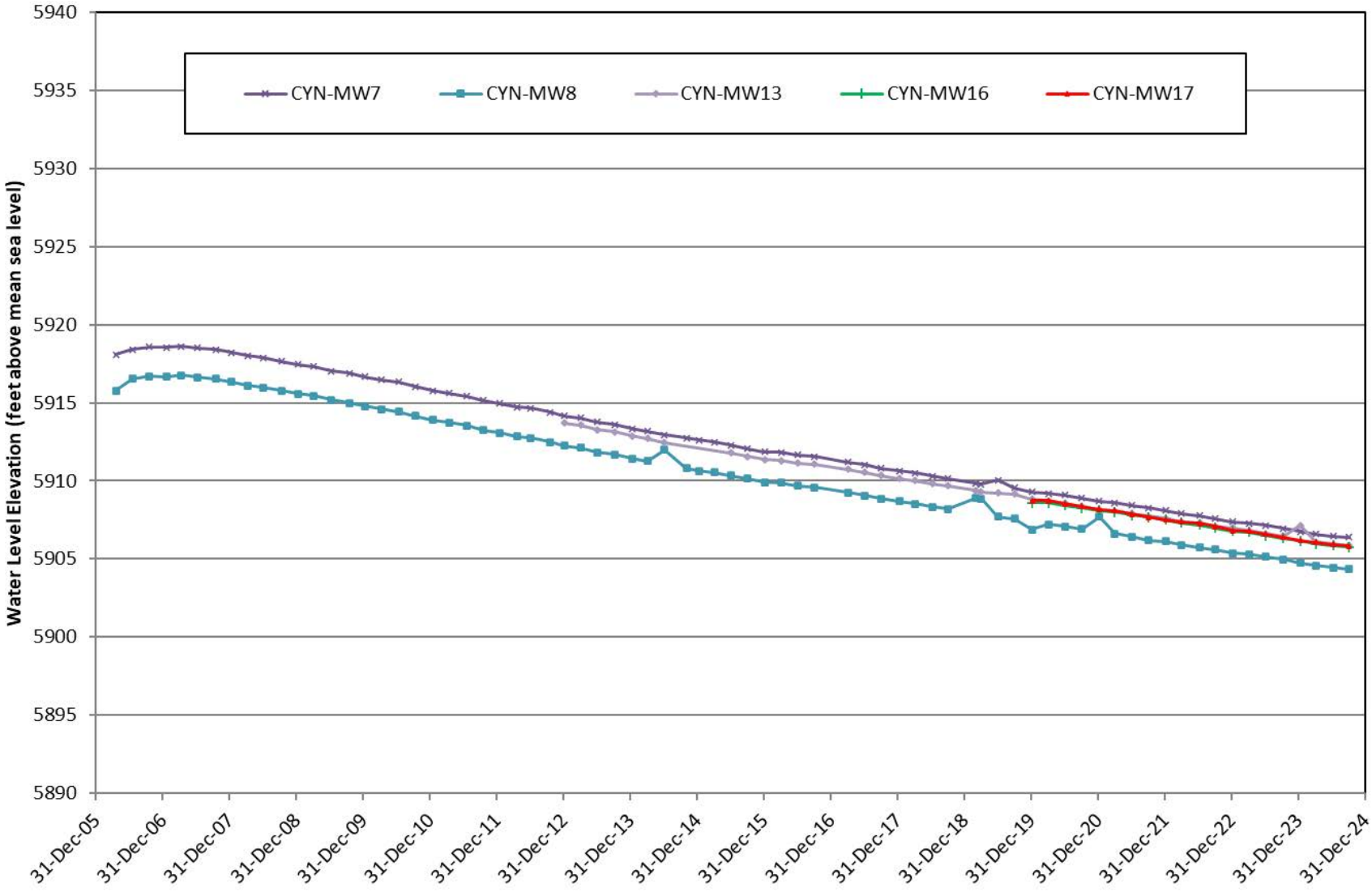


Figure 7D-4
Burn Site Groundwater Area of Concern Wells (4 of 9)

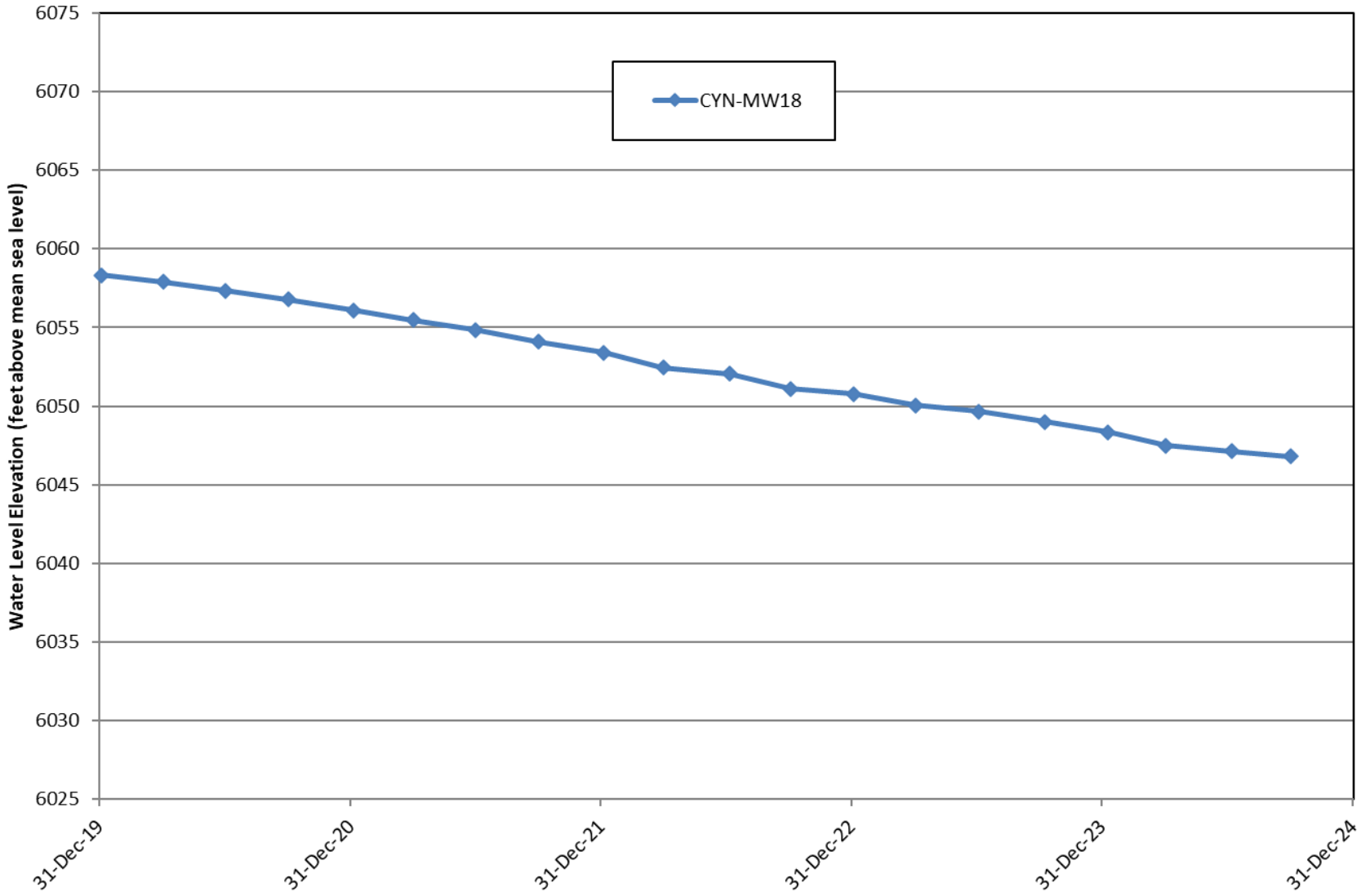


Figure 7D-5
Burn Site Groundwater Area of Concern Wells (5 of 9)

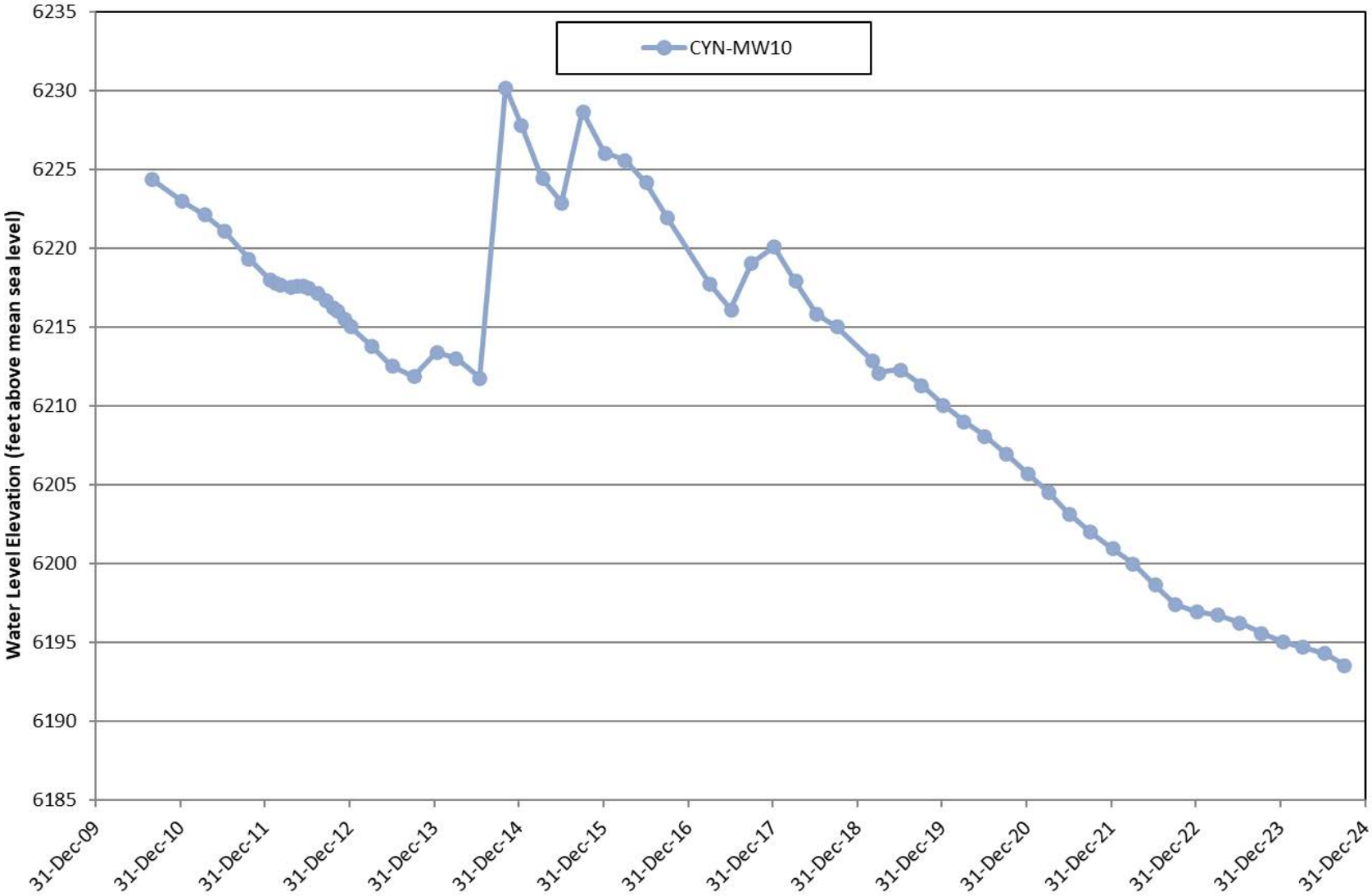


Figure 7D-6
Burn Site Groundwater Area of Concern Wells (6 of 9)

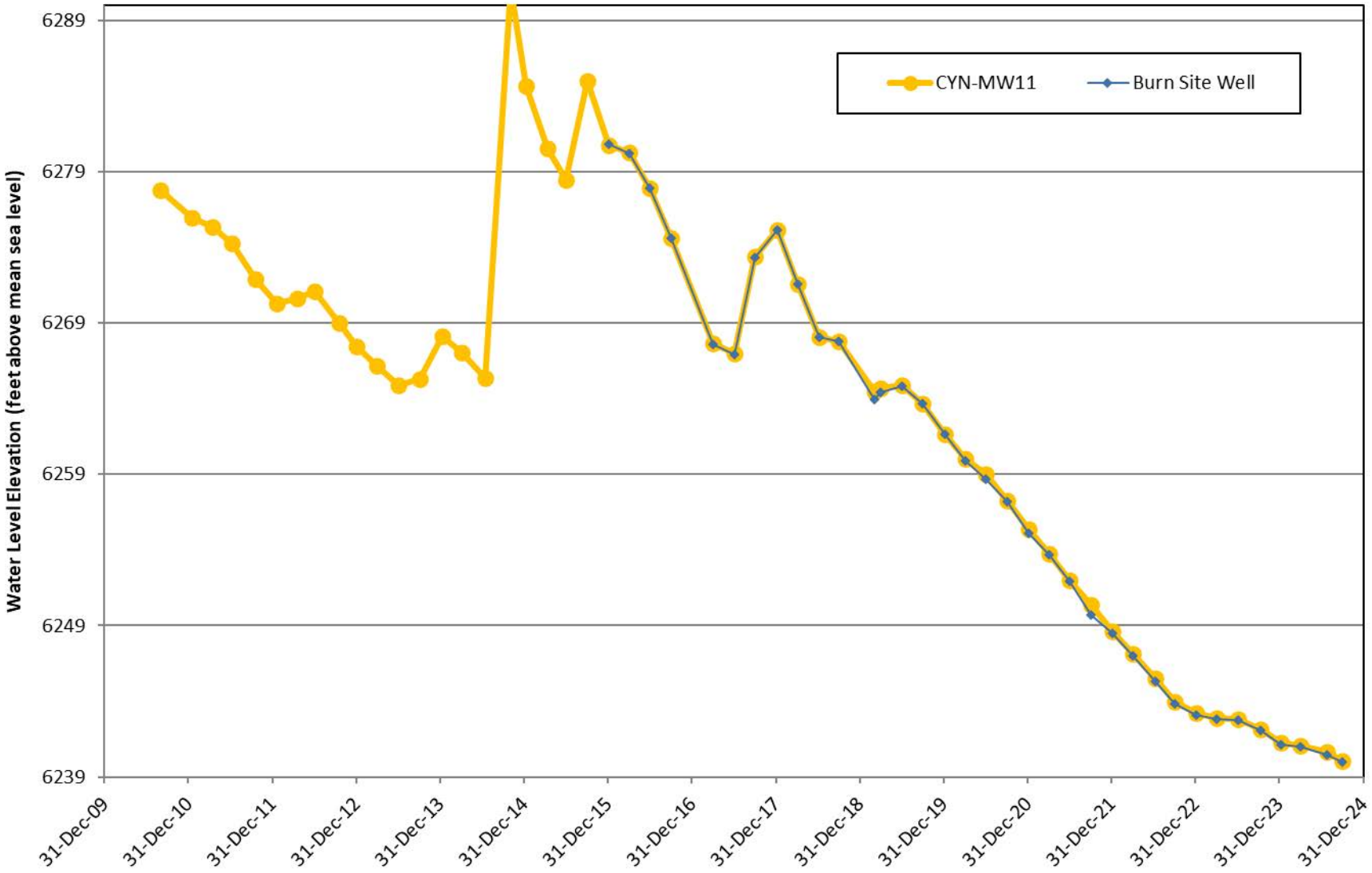


Figure 7D-7
Burn Site Groundwater Area of Concern Wells (7 of 9)

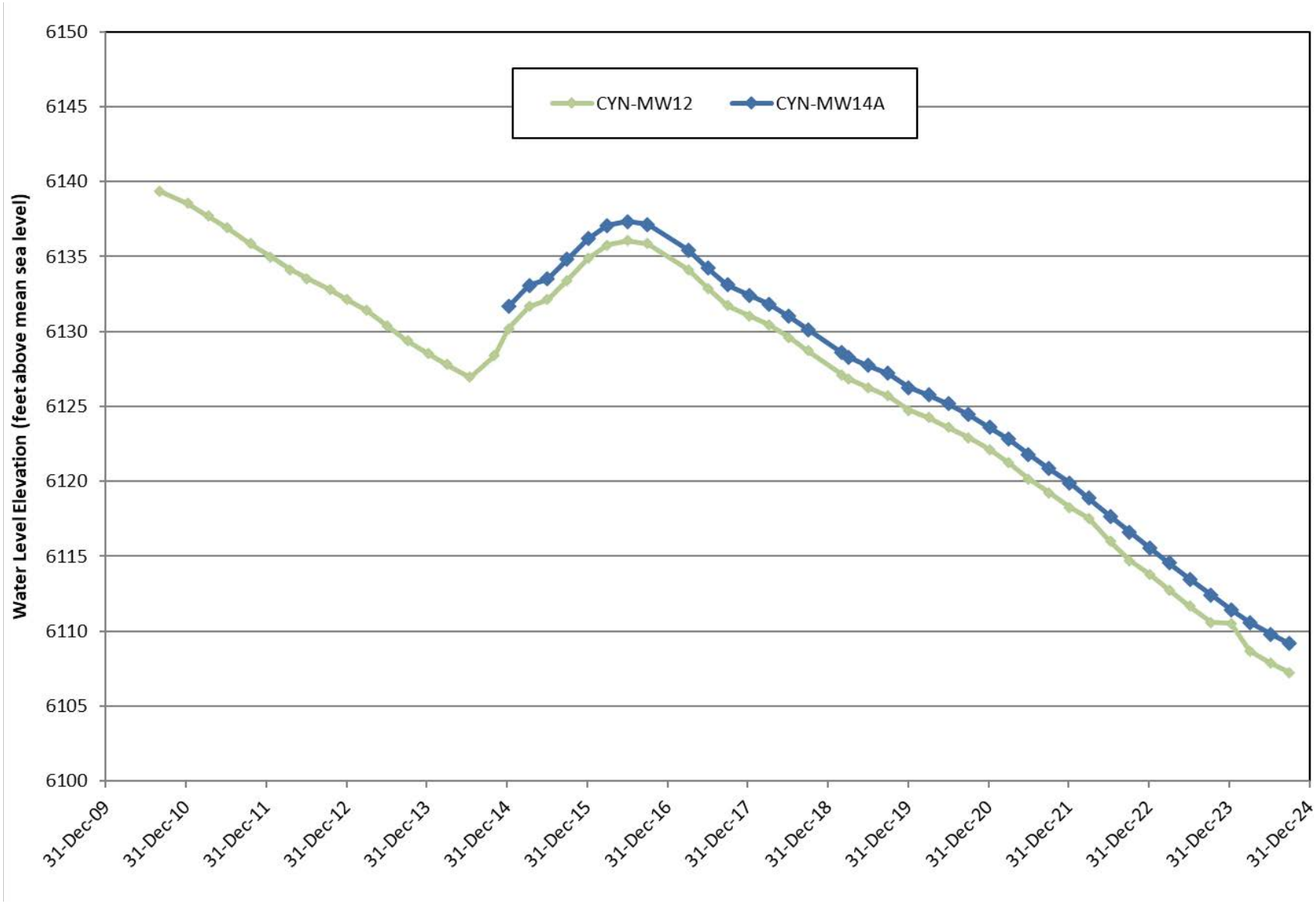


Figure 7D-8
Burn Site Groundwater Area of Concern Wells (8 of 9)

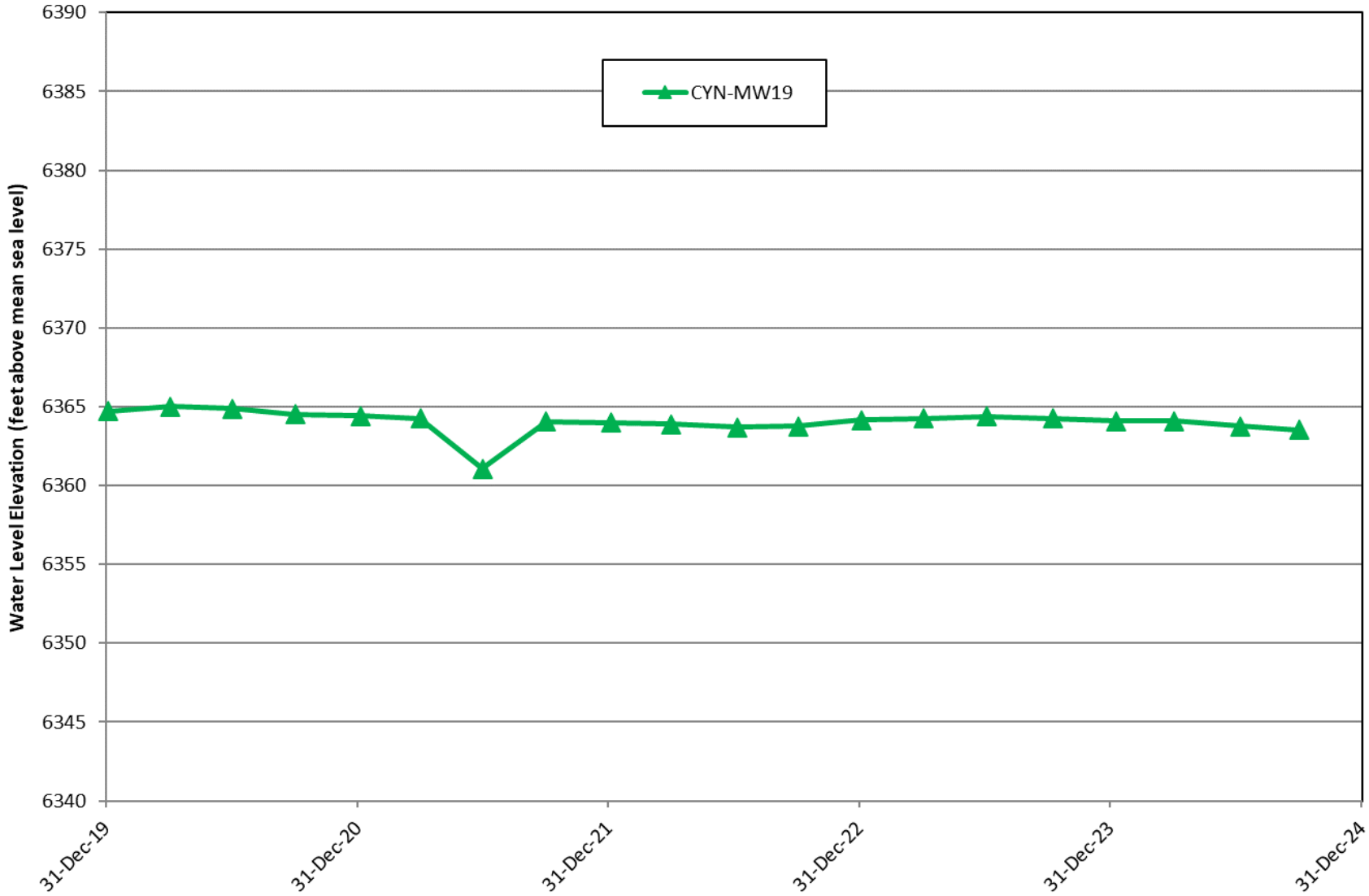


Figure 7D-9
Burn Site Groundwater Area of Concern Wells (9 of 9)

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Chapter 7.0
Burn Site Groundwater Area of Concern References

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Table 1
Inventory of Active and Decommissioned Site-Wide Groundwater Monitoring, Production, and Extraction Wells Located at Sandia National Laboratories, New Mexico[a], Kirtland Air Force Base, and Surrounding Areas

Well ID	Type	Measuring Point[b, c] (ft amsl, NAVD 88)	Ground Surface[c] (ft amsl, NAVD 88)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Top of Screen (ft amsl)	Bottom of Screen (ft amsl)	Casing Total Depth (ft bgs)	Casing, Inner Diameter (inches)	Casing Material	Lithology of Screened Interval	Installation Date	P&A Date, If Applicable
Chemical Waste Landfill and Vicinity													
CWL-BW1	MW	5437.95	5436.0	445.0	495.0	4991.0	4941.0	495.0	2.1	SS	Regional Aquifer – SFG sediments	08-Jul-1985	Aug-2003
CWL-BW2	MW	5436.21	5434.3	490.0	980.0	4944.3	4454.3	980.0	5.6	S/SS	Regional Aquifer – SFG sediments	17-Sep-1985	2003
CWL-BW3	MW	5432.76	5431.6	485.0	505.0	4946.6	4926.6	507.5	4.8	PVC	Regional Aquifer – SFG sediments	22-Sep-1988	12-Nov-2012
CWL-BW4	MW	5427.67	5431.7	485.0	505.0	4946.7	4926.7	510.0	4.8	PVC	Regional Aquifer – SFG sediments	06-May-1994	Jan-1997
CWL-BW4A	MW	5434.03	5431.8	485.0	505.0	4946.8	4926.8	510.0	4.8	PVC	Regional Aquifer – SFG sediments	16-May-1994	14-Apr-2010
CWL-BW5	MW	5434.79	5432.2	500.0	520.0	4932.2	4912.2	525.0	4.8	PVC	Regional Aquifer – SFG sediments	11-May-2010	
CWL-MW1	MW	5425.88	5423.7	535.0	575.0	4888.7	4848.7	610.0	2.1	SS	Regional Aquifer – SFG sediments	01-Sep-1985	Sep-1997
CWL-MW1A	MW	5424.16	5423.1	474.0	494.0	4949.1	4929.1	495.0	4.8	PVC	Regional Aquifer – SFG sediments	31-Jul-1988	11-Nov-2012
CWL-MW2	MW	5421.22	5419.1	520.0	650.0	4899.1	4769.1	650.0	2.1	SS	Regional Aquifer – SFG sediments	22-Sep-1985	Sep-1997
CWL-MW2A	MW	5421.25	5419.8	473.0	493.0	4946.8	4926.8	495.0	5.0	PVC	Regional Aquifer – SFG sediments	01-Aug-1988	Jun-2004
CWL-MW2BL	MW	5421.85	5420.1	532.5	552.5	4887.6	4867.6	557.5	4.8	PVC	Regional Aquifer – SFG sediments	05-Jun-1994	10-Nov-2012
CWL-MW2BU	MW	5421.88	5420.1	476.0	496.0	4944.1	4924.1	501.0	1.9	PVC	Regional Aquifer – SFG sediments	05-Jun-1994	10-Nov-2012
CWL-MW3	MW	5421.50	5419.5	525.0	565.0	4894.5	4854.5	615.0	2.1	SS	Regional Aquifer – SFG sediments	26-Sep-1985	Sep-1997
CWL-MW3A	MW	5420.45	5419.1	470.0	490.0	4949.1	4929.1	492.0	4.8	PVC/SS	Regional Aquifer – SFG sediments	11-Aug-1988	10-Nov-2012
CWL-MW4	MW	5423.00	5421.0	478.0	498.0	4943.0	4923.0	503.0	3.8	PVC/SS	Regional Aquifer – SFG sediments	04-May-1990	14-Apr-2010
CWL-MW5L	MW	5418.47	5416.7	533.0	553.0	4883.7	4863.7	558.0	1.9	PVC	Regional Aquifer – SFG sediments	19-Apr-1994	14-Apr-2010
CWL-MW5U	MW	5418.68	5416.7	477.0	497.0	4939.7	4919.7	502.0	4.8	PVC	Regional Aquifer – SFG sediments	19-Apr-1994	14-Apr-2010
CWL-MW6L	MW	5419.80	5417.3	539.0	559.0	4878.3	4858.3	564.0	1.9	PVC	Regional Aquifer – SFG sediments	04-May-1994	14-Apr-2010
CWL-MW6U	MW	5419.45	5417.3	477.0	497.0	4940.3	4920.3	502.0	4.8	PVC	Regional Aquifer – SFG sediments	04-May-1994	14-Apr-2010
CWL-MW7	MW	5421.98	5419.9	618.0	638.0	4801.9	4781.9	643.0	4.8	PVC	Regional Aquifer – SFG sediments	20-Mar-2003	12-Nov-2012
CWL-MW8	MW	5421.71	5419.8	612.0	632.0	4807.8	4787.8	637.0	4.8	PVC	Regional Aquifer – SFG sediments	02-Apr-2003	12-Nov-2012
CWL-MW9	MW	5426.12	5423.5	495.0	515.0	4928.5	4908.5	520.0	4.8	PVC	Regional Aquifer – SFG sediments	13-May-2010	
CWL-MW10	MW	5424.58	5422.2	493.0	513.0	4929.2	4909.2	518.0	4.8	PVC	Regional Aquifer – SFG sediments	27-May-2010	
CWL-MW11	MW	5423.24	5420.8	491.0	511.0	4929.8	4909.8	516.0	4.8	PVC	Regional Aquifer – SFG sediments	27-May-2010	
MRN-1	MW	5308.54	5306.4	546.7	586.7	4759.7	4719.7	606.7	4.8	SS	Regional Aquifer – SFG sediments	22-Jan-1995	Aug-2001
MRN-2	MW	5308.18	5306.2	410.0	440.0	4896.2	4866.2	450.0	3.7	PVC	Regional Aquifer – SFG sediments	28-Jan-1995	
MRN-3D	MW	5309.34	5306.8	660.3	680.3	4646.5	4626.5	685.3	4.8	PVC	Regional Aquifer – SFG sediments	20-Jul-2003	
SWTA-3	MW	5323.24	5321.6	407.2	427.2	4914.4	4894.4	432.2	4.8	PVC/SS	Regional Aquifer – SFG sediments	06-Sep-1989	Apr-1998
SWTA3-MW2	MW	5325.60	5323.2	455.0	475.0	4868.2	4848.2	480.0	4.8	PVC	Regional Aquifer – SFG sediments	07-May-2002	
SWTA3-MW3	MW	5323.94	5321.4	619.0	639.0	4702.4	4682.4	659.4	4.8	PVC	Regional Aquifer – SFG sediments	20-Feb-2004	
SWTA3-MW4	MW	5324.81	5322.3	430.0	450.0	4892.3	4872.3	460.0	4.7	PVC	Regional Aquifer – SFG sediments	26-Aug-2005	
Lurance Canyon and Burn Site Vicinity													
12AUP01	MW	6357.00	6355.0	52.5	57.5	6302.5	6297.5	58.1	2.0	PVC	Alluvium and bedrock (granitic gneiss)	19-Nov-1996	14-Nov-2012
CCBA-MW1	MW	5902.34	5899.9	60.0	80.0	5839.9	5819.9	85.0	4.7	PVC	Alluvium and bedrock (granite)	01-Sep-2011	
CCBA-MW2	MW	5939.28	5937.0	98.0	118.0	5839.0	5819.0	123.0	4.7	PVC	Bedrock (granite)	31-Aug-2011	

Table 1 (continued)
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Lurance Canyon and Burn Site Vicinity (Continued)													
CYN-MW1D	MW	6239.59	6236.7	372.0	382.0	5864.7	5854.7	392.0	5.1	S	Bedrock (granitic gneiss)	22-Dec-1997	15-Nov-2012
CYN-MW2S	MW	6239.41	6236.7	23.6	28.6	6213.1	6208.1	34.2	4.0	PVC	Alluvium and bedrock (granitic gneiss)	22-Dec-1997	15-Nov-2012
CYN-MW3	MW	6313.26	6311.9	120.0	130.0	6191.9	6181.9	135.0	5.0	PVC	Bedrock (metamorphics)	18-Jun-1999	
CYN-MW4	MW	6455.48	6454.7	260.0	280.0	6194.7	6174.7	290.0	5.0	PVC	Bedrock (quartzite)	18-Jun-1999	
CYN-MW5	MW	5984.23	5981.3	135.0	155.0	5846.3	5826.3	160.0	5.0	PVC	Bedrock (quartzite)	15-Aug-2001	
CYN-MW6	MW	6343.37	6340.5	141.5	161.3	6199.0	6179.2	161.7	5.0	PVC	Bedrock (metamorphics)	09-Dec-2005	
CYN-MW7	MW	6216.35	6213.7	315.0	334.2	5898.7	5879.5	339.9	5.0	PVC	Bedrock (granitic gneiss)	06-Dec-2005	
CYN-MW8	MW	6230.11	6227.8	338.5	358.3	5889.3	5869.5	363.4	5.0	PVC	Bedrock (granitic gneiss)	12-Jan-2006	
CYN-MW9	MW	6360.67	6358.5	175.8	195.8	6182.7	6162.7	200.8	4.8	PVC	Bedrock (metamorphics)	27-Jul-2010	
CYN-MW10	MW	6345.45	6342.8	150.4	170.4	6192.4	6172.4	175.4	4.8	PVC	Bedrock (metamorphics)	28-Jul-2010	
CYN-MW11	MW	6374.41	6371.9	229.8	249.8	6142.1	6122.1	254.8	4.8	PVC	Bedrock (metamorphics)	29-Jul-2010	
CYN-MW12	MW	6345.16	6342.9	252.5	272.5	6090.4	6070.4	277.5	4.8	PVC	Bedrock (metamorphics)	29-Jul-2010	
CYN-MW13	MW	6237.79	6236.0	376.8	396.8	5859.2	5839.2	402.2	4.8	PVC	Bedrock (granitic gneiss)	05-Dec-2012	
CYN-MW14A	MW	6315.85	6313.5	263.6	293.6	6049.9	6019.9	298.6	4.8	PVC	Bedrock (metamorphics)	09-Dec-2014	
CYN-MW15	MW	6344.44	6342.3	162.2	192.2	6180.1	6150.1	195.0	4.8	PVC	Bedrock (metamorphics)	08-Dec-2014	
CYN-MW16	MW	6249.60	6247.4	375.6	405.6	5871.8	5841.8	410.6	4.8	PVC	Bedrock (granitic gneiss)	5-Nov-2019	
CYN-MW17	MW	6268.95	6266.6	370.3	400.3	5896.3	5866.3	405.3	4.8	PVC	Bedrock (granitic gneiss)	6-Nov-2019	
CYN-MW18	MW	6304.02	6301.5	270.4	300.4	6031.1	6001.1	305.4	4.8	PVC	Bedrock (metamorphics)	7-Nov-2019	
CYN-MW19	MW	6410.43	6408.1	59.3	89.3	6348.8	6318.8	94.3	4.8	PVC	Bedrock (metamorphics)	8-Nov-2019	
Greystone-MW2	MW	5814.20	5811.4	60.0	80.0	5751.4	5731.4	85.0	4.8	PVC	Alluvium in arroyo, recent	25-Apr-2002	
Mixed Waste Landfill and Vicinity													
MWL-BW1	MW	5387.18	5385.4	452.2	472.2	4933.2	4913.2	477.2	5.0	PVC	Regional Aquifer – SFG sediments	01-Jul-1989	24-Jan-2008
MWL-BW2	MW	5391.02	5388.7	467.0	497.0	4921.7	4891.7	502.0	4.8	PVC	Regional Aquifer – SFG sediments	22-Jan-2008	
MWL-MW1	MW	5384.21	5381.8	456.0	476.0	4925.8	4905.8	478.0	5.0	PVC/S	Regional Aquifer – SFG sediments	01-Oct-1988	Jul-2008
MWL-MW2	MW	5379.93	5378.4	452.0	472.0	4926.4	4906.4	477.0	5.0	PVC/SS	Regional Aquifer – SFG sediments	01-Aug-1989	Jul-2008
MWL-MW3	MW	5383.99	5381.7	451.3	471.3	4930.4	4910.4	476.3	4.8	PVC/SS	Regional Aquifer – SFG sediments	22-Aug-1989	Jul-2008
MWL-MW4[d]	MW	5391.70	5390.2	488.4[d]	508.4[d]	4901.8[d]	4881.8[d]	553.9[d]	4.8	PVC	Regional Aquifer – SFG sediments	10-Feb-1993	
MWL-MW5	MW	5382.56	5380.4	496.5	516.5	4883.9	4863.9	521.5	4.8	PVC	Regional Aquifer – SFG sediments	19-Nov-2000	
MWL-MW6	MW	5375.31	5372.7	505.5	525.5	4867.2	4847.2	530.5	4.8	PVC	Regional Aquifer – SFG sediments	19-Oct-2000	
MWL-MW7	MW	5383.30	5380.9	464.7	494.0	4916.2	4886.9	498.8	4.8	PVC	Regional Aquifer – SFG sediments	24-Jun-2008	
MWL-MW8	MW	5384.67	5382.4	465.0	495.0	4917.4	4887.4	500.0	4.8	PVC	Regional Aquifer – SFG sediments	26-Jun-2008	
MWL-MW9	MW	5381.91	5379.3	465.0	495.0	4914.3	4884.3	500.0	4.8	PVC	Regional Aquifer – SFG sediments	30-Jun-2008	
NWTA3-MW1	MW	5336.48	5332.9	434.9	454.9	4898.0	4878.0	460.4	4.8	PVC	Regional Aquifer – SFG sediments	20-Sep-1989	12-Sep-2002
NWTA3-MW2	MW	5337.49	5335.5	455.0	475.0	4880.5	4860.5	505.0	4.8	PVC	Regional Aquifer – SFG sediments	25-Aug-2000	
NWTA3-MW3D	MW	5340.80	5335.7	654.4	674.4	4681.3	4661.3	679.4	4.8	PVC	Regional Aquifer – SFG sediments	09-Jul-2003	
PL-1	MW	5334.99	5333.4	440.0	470.0	4893.4	4863.4	480.0	2.0	PVC	Regional Aquifer – SFG sediments	28-Oct-1994	12-Sep-2009
PL-2	MW	5336.01	5333.0	577.0	597.0	4756.0	4736.0	617.0	4.8	SS	Regional Aquifer – SFG sediments	18-Nov-1994	

Table 1 (continued)
Inventory of Active and Decommissioned Site-Wide Groundwater Monitoring, Production, and Extraction Wells Located at Sandia National Laboratories, New Mexico[a], Kirtland Air Force Base, and Surrounding Areas

Well ID	Type	Measuring Point[b, c] (ft amsl, NAVD 88)	Ground Surface[c] (ft amsl, NAVD 88)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Top of Screen (ft amsl)	Bottom of Screen (ft amsl)	Casing Total Depth (ft bgs)	Casing, Inner Diameter (inches)	Casing Material	Lithology of Screened Interval	Installation Date	P&A Date, If Applicable
Mixed Waste Landfill and Vicinity (Continued)													
PL-3	MW	5334.64	5332.8	445.0	465.0	4887.8	4867.8	475.0	3.8	PVC	Regional Aquifer – SFG sediments	04-Dec-1994	12-Sep-2009
PL-4	MW	5334.98	5332.7	464.0	494.0	4868.7	4838.7	499.0	4.8	PVC	Regional Aquifer – SFG sediments	28-Sep-2009	
Coyote Test Field and Vicinity													
CTF-MW1	MW	6082.63	6079.7	240.0	260.0	5839.7	5819.7	265.0	5.0	PVC	Bedrock (granite)	16-Aug-2001	
CTF-MW2	MW	5578.60	5575.6	110.0	130.0	5465.6	5445.6	135.0	5.0	PVC	Bedrock (granite)	18-Aug-2001	
CTF-MW3	MW	5522.82	5519.8	340.0	360.0	5179.8	5159.8	365.0	5.0	PVC	Bedrock (granite)	21-Aug-2001	
LMF-1	MW	5628.60	5626.5	310.0	350.0	5316.5	5276.5	360.0	4.1	PVC	Bedrock (limestone)	11-Aug-1995	15-Jan-1998
OBS-MW1	MW	5871.42	5869.1	135.0	155.0	5734.1	5714.1	160.0	4.7	PVC	Bedrock (granite)	31-Aug-2011	
OBS-MW2	MW	5863.16	5860.8	234.0	254.0	5626.8	5606.8	259.0	4.7	PVC	Bedrock (granite)	30-Aug-2011	
OBS-MW3	MW	5865.50	5863.3	190.0	210.0	5673.3	5653.3	215.0	4.7	PVC	Bedrock (granite)	30-Aug-2011	
SFR-1D[e]	MW	5399.13	5396.9	348.0	368.0	5048.9	5028.9	378.0	3.8	PVC	Regional Aquifer – SFG sediments	06-Aug-1992	
SFR-1S[e]	MW	5399.16	5396.9	152.0	172.0	5244.9	5224.9	182.0	1.9	PVC	Regional Aquifer – SFG sediments	08-Aug-1992	
SFR-2S	MW	5432.77	5430.3	97.0	117.0	5333.3	5313.3	122.0	3.8	PVC	Regional Aquifer – SFG sediments	20-Aug-1992	
SFR-3D	MW	5497.94	5496.1	311.5	351.5	5184.6	5144.6	361.5	1.9	PVC	Regional Aquifer – SFG sediments	05-Nov-1992	
SFR-3P	MW	5499.63	5497.2	175.0	195.0	5322.2	5302.2	205.0	3.8	PVC	Regional Aquifer – SFG sediments	12-Jul-1993	
SFR-3S	MW	5498.24	5496.1	182.0	212.0	5314.1	5284.1	222.0	1.9	PVC	Regional Aquifer – SFG sediments	10-Nov-1992	
SFR-3T	MW	5498.66	5496.9	713.0	733.0	4783.9	4763.9	753.0	5.4	SS	Bedrock (sandstone)	23-Sep-1993	
SFR-4P	MW	5573.33	5571.3	344.0	354.0	5227.3	5217.3	364.0	1.9	PVC	Bedrock (sandstone)	29-Jul-1993	
SFR-4T	MW	5573.95	5572.4	340.0	360.0	5232.4	5212.4	380.0	4.8	PVC/SS	Bedrock (sandstone)	30-Sep-1993	
STW-1	MW	5535.53	5533.3	149.8	169.8	5383.5	5363.5	179.8	4.3	PVC	Regional Aquifer – SFG sediments	18-Jun-1995	23-Sep-1997
TRE-1	MW	5497.25	5495.2	255.0	295.0	5240.2	5200.2	305.0	4.3	PVC	Regional Aquifer – SFG sediments	31-Jul-1995	
TRE-2	MW	5497.20	5495.2	150.0	170.0	5345.2	5325.2	190.0	2.0	PVC	Regional Aquifer – SFG sediments	31-Jul-1995	
TRN-1	MW	5735.62	5733.6	320.0	340.0	5413.6	5393.6	350.0	3.8	PVC	Bedrock (sandstone)	12-Oct-1994	
TRS-1D	MW	5779.80	5777.5	266.4	306.4	5511.1	5471.1	316.4	1.9	PVC	Bedrock (limestone)	06-Sep-1995	
TRS-1S	MW	5780.07	5777.5	164.0	204.0	5613.5	5573.5	214.8	1.9	PVC	Bedrock (limestone)	06-Sep-1995	
TRS-2	MW	5780.76	5778.3	165.0	205.0	5613.3	5573.3	210.0	4.5	S	Bedrock (limestone)	09-Sep-1995	
Tijeras Arroyo Groundwater													
PGS-1	MW	5407.41	5407.9	503.0	513.0	4904.9	4894.9	538.0	5.0	SS	Regional Aquifer – SFG sediments	12-Oct-1994	Apr-1998
PGS-2[f]	MW	5406.93	5407.6	535.0[f]	565.0[f]	4872.9	4842.9	655.0	5.0	SS	Regional Aquifer – SFG sediments	22-Sep-1995	
TA1-W-01	MW	5403.82	5401.8	575.0	595.0	4826.8	4806.8	600.0	4.8	PVC	Regional Aquifer – SFG sediments	22-Mar-1997	
TA1-W-02	MW	5416.62	5416.9	540.0	560.0	4876.9	4856.9	565.6	5.0	PVC	Regional Aquifer – SFG sediments	27-Feb-1998	
TA1-W-03	MW	5457.03	5454.9	337.0	357.0	5117.9	5097.9	362.6	5.0	PVC	PGWS – SFG sediments	27-Jan-1998	
TA1-W-04	MW	5460.98	5458.3	576.0	596.0	4882.3	4862.3	601.7	5.0	PVC	Regional Aquifer – SFG sediments	06-Oct-1998	
TA1-W-05	MW	5433.84	5434.2	597.5	617.5	4836.7	4816.7	623.2	5.0	PVC	Regional Aquifer – SFG sediments	16-Nov-1998	
TA1-W-06	MW	5417.10	5417.4	300.0	320.0	5117.4	5097.4	325.6	5.0	PVC	PGWS – SFG sediments	27-Feb-1998	
TA1-W-07	MW	5404.92	5402.8	268.6	288.6	5134.2	5114.2	289.1	5.0	PVC	PGWS – SFG sediments	03-Dec-1998	
TA1-W-08	MW	5434.19	5434.7	302.0	322.0	5132.7	5112.7	327.0	4.5	PVC	PGWS – SFG sediments	10-Oct-2001	

Table 1 (continued)
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Tijeras Arroyo Groundwater (Continued)													
TA2-NW1-325	MW	5421.94	5420.0	295.0	325.0	5125.0	5095.0	330.3	4.8	PVC	PGWS – SFG sediments	01-Apr-1993	
TA2-NW1-595[g]	MW	5421.26	5420.0	535.0[g]	555.0[g]	4885.0	4865.0	598.0	4.8	PVC	Regional Aquifer – SFG sediments	27-Jul-1993	
TA2-SW1-320	MW	5411.85	5410.1	299.6	319.6	5110.5	5090.5	324.6	3.8	PVC	PGWS – SFG sediments	30-Nov-1992	12-Dec-2014
TA2-W-01	MW	5419.99	5417.4	312.0	332.0	5105.4	5085.4	332.0	4.8	PVC	PGWS – SFG sediments	27-Jun-1994	
TA2-W-19	MW	5351.21	5349.0	265.9	285.9	5083.1	5063.1	285.9	4.8	PVC	PGWS – SFG sediments	29-Nov-1995	
TA2-W-24	MW	5363.66	5361.8	465.0	485.0	4896.8	4876.8	490.6	5.0	PVC	Regional Aquifer – SFG sediments	09-Feb-1998	
TA2-W-25	MW	5374.86	5372.5	492.0	512.0	4880.5	4860.5	517.8	4.8	PVC	Regional Aquifer – SFG sediments	28-Apr-1997	
TA2-W-26	MW	5375.77	5373.8	276.0	296.0	5097.8	5077.8	301.6	5.0	PVC	PGWS – SFG sediments	19-Jan-1998	
TA2-W-27	MW	5362.85	5360.8	275.0	295.0	5085.8	5065.8	300.6	5.0	PVC	PGWS – SFG sediments	09-Feb-1998	
TA2-W-28	MW	5412.41	5410.0	310.5	330.5	5099.5	5079.5	335.45	4.8	PVC	PGWS – SFG sediments	10-Dec-2014	
TJA-1	MW	unk	5351.3	275.0	295.0	5076.3	5056.3	305.0	3.8	PVC	PGWS – SFG sediments	25-Jun-1994	9-Jul-1994
TJA-2	MW	5353.20	5351.3	275.0	295.0	5076.3	5056.3	305.0	3.8	PVC	PGWS – SFG sediments	12-Jul-1994	
TJA-3	MW	5390.56	5387.8	496.0	516.0	4891.8	4871.8	521.7	5.0	PVC	Regional Aquifer – SFG sediments	04-Dec-1998	
TJA-4[h]	MW	5341.16	5338.5	360.0	380.0	4978.5	4958.5	385.7	5.0	PVC	Merging Zone – SFG sediments	01-Dec-1998	
TJA-5	MW	5341.33	5338.5	267.0	287.0	5071.5	5051.5	292.7	5.0	PVC	PGWS – SFG sediments	02-Dec1998	
TJA-6	MW	5343.16	5340.6	454.9	474.9	4885.7	4865.7	480.7	5.0	PVC	Regional Aquifer – SFG sediments	04-Feb-2001	
TJA-7	MW	5391.27	5388.4	290.5	310.5	5097.9	5077.9	316.3	5.0	PVC	PGWS – SFG sediments	12-Mar-2001	
WYO-1	MW	5392.50	5390.4	510.0	560.0	4880.4	4830.4	570.0	4.3	PVC	Regional Aquifer – SFG sediments	28-Aug-1995	Jul-2001
WYO-2	MW	5392.50	5390.4	265.0	285.0	5125.4	5105.4	295.0	2.0	PVC	PGWS – SFG sediments	26-Sep-1995	Jul-2001
WYO-3	MW	5392.09	5390.0	520.0	540.0	4870.0	4850.0	545.0	4.5	PVC	Regional Aquifer – SFG sediments	10-Oct-2001	
WYO-4	MW	5392.57	5390.2	275.0	295.0	5115.2	5095.2	300.0	4.5	PVC	PGWS – SFG sediments	16-Oct-2001	
Technical Area V													
AVN-1	MW	5443.00	5440.2	570.0	590.0	4870.2	4850.2	600.0	5.0	SS	Regional Aquifer – SFG sediments	23-May-1995	07-Feb-2023
AVN-2	MW	5442.39	5440.6	495.0	515.0	4945.6	4925.6	520.0	3.8	PVC	Regional Aquifer – SFG sediments	5-Jun-1995	07-Feb-2023
LWDS-MW1	MW	5423.83	5424.5	495.0	515.0	4929.5	4909.5	520.3	3.9	PVC	Regional Aquifer – SFG sediments	03-May-1993	
LWDS-MW2	MW	5412.41	5411.5	506.0	526.0	4905.5	4885.5	531.0	3.9	PVC/SS	Regional Aquifer – SFG sediments	30-Oct-1992	09-Feb-2023
TAV-INJ1[i]	INJ	5429.70	5430.1	509.0	539.0	4921.1	4891.1	544.0	5.0	Dual PVC	Regional Aquifer – SFG sediments	11-Oct-2017	
TAV-MW1	MW	5437.81	5435.2	489.5	509.5	4945.7	4925.7	509.5	5.0	PVC	Regional Aquifer – SFG sediments	28-Feb-1995	05-Feb-2008
TAV-MW2	MW	5427.33	5424.3	497.0	513.5	4927.3	4910.8	513.5	4.8	PVC	Regional Aquifer – SFG sediments	30-Mar-1995	
TAV-MW3	MW	5464.30	5461.6	532.0	552.0	4929.6	4909.6	557.7	4.8	PVC	Regional Aquifer – SFG sediments	11-Apr-1997	
TAV-MW4	MW	5427.89	5425.4	495.0	515.0	4930.4	4910.4	520.7	4.8	PVC	Regional Aquifer – SFG sediments	18-Apr-1997	
TAV-MW5	MW	5408.71	5406.6	487.0	507.0	4919.6	4899.6	512.7	4.8	PVC	Regional Aquifer – SFG sediments	26-Apr-1997	
TAV-MW6	MW	5431.17	5431.5	507.0	527.0	4924.5	4904.5	532.0	4.8	PVC	Regional Aquifer – SFG sediments	24-Apr-2001	
TAV-MW7	MW	5430.40	5430.9	597.0	617.0	4833.9	4813.9	622.0	4.8	PVC	Regional Aquifer – SFG sediments	06-Apr-2001	
TAV-MW8	MW	5417.00	5417.4	491.0	511.0	4926.4	4906.4	516.0	4.8	PVC	Regional Aquifer – SFG sediments	11-Apr-2001	
TAV-MW9	MW	5416.27	5416.9	582.0	602.0	4834.9	4814.9	607.0	4.8	PVC	Regional Aquifer – SFG sediments	17-Mar-2001	
TAV-MW10	MW	5437.03	5434.7	508.0	528.0	4926.7	4906.7	533.0	4.8	PVC	Regional Aquifer – SFG sediments	06-Feb-2008	

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Technical Area V (Continued)													
TAV-MW11	MW	5440.12	5440.4	512.0	532.0	4928.4	4908.4	537.0	4.8	PVC	Regional Aquifer – SFG sediments	19-Nov-2010	
TAV-MW12	MW	5435.72	5432.9	507.0	527.0	4925.9	4905.9	532.0	4.8	PVC	Regional Aquifer – SFG sediments	16-Nov-2010	
TAV-MW13	MW	5409.02	5406.0	525.0	545.0	4881.0	4861.0	550.0	4.8	PVC	Regional Aquifer – SFG sediments	12-Nov-2010	
TAV-MW14	MW	5441.52	5438.6	512.0	532.0	4926.6	4906.6	538.0	4.8	PVC	Regional Aquifer – SFG sediments	09-Nov-2010	
TAV-MW15	MW	5437.32	5435.1	516.0	541.0	4919.1	4894.1	546.0	4.8	PVC	Regional Aquifer – SFG sediments	18-Jan-2017	
TAV-MW16	MW	5448.34	5446.1	527.0	552.0	4919.1	4894.1	557.0	4.8	PVC	Regional Aquifer – SFG sediments	12-Jan-2017	
TAV-MW17	MW	5443.92	5441.3	523.0	543.0	4918.3	4898.3	548.0	4.8	PVC	Regional Aquifer – SFG sediments	5-Apr-2023	
Albuquerque Bernalillo County Water Utility Authority, City of Albuquerque, and New Mexico Office of the State Engineer													
4HILLS-1	MW	5554.17	5552.7	24.0	64.0	5528.7	5488.7	69.0	4.0	PVC	Alluvial sands and gravels	1-Dec-1989	
Eubank-1	MW	5460.02	5458.1	550.0	610.0	4908.1	4848.1	615.0	4.0	SS	Regional Aquifer – SFG sediments	16-Jul-1988	
Eubank-2	MW	5474.39	5472.4	552.0	592.0	4920.4	4880.4	597.0	4.0	PVC	Regional Aquifer – SFG sediments	15-Nov-1996	
Eubank-3	MW	5498.73	5496.7	590.0	650.0	4906.7	4846.7	655.0	4.0	PVC	Regional Aquifer – SFG sediments	15-Nov-1996	
Eubank-5	MW	5507.40	5505.4	605.0	665.0	4900.4	4840.4	670.0	4.0	PVC	Regional Aquifer – SFG sediments	15-Nov-1996	
Mesa del Sol-S	MW	5302.67	5302.7	420.0	520.0	4882.7	4782.7	525.0	2.2	PVC	Regional Aquifer – SFG sediments	14-May-1997	
Montessa Park-S	MW	5102.67	5102.7	260.0	320.0	4842.7	4782.7	330.0	2.2	PVC	Regional Aquifer – SFG sediments	10-Sep-1997	
YALE-MW1	MW	5308.45	5309.0?	400.0	464.0	4909.0?	4845.0?	464.0	4.0	PVC	Regional Aquifer – SFG sediments	1997?	
YALE-MW9	MW	5271.06	5272.0?	382.0	422.0	4890.0?	4850.0?	427.0	4.0	PVC	Regional Aquifer – SFG sediments	19-May-1997	
Kirtland Air Force Base/U.S. Air Force[j]													
KAFB-0118	MW	5320.70	5321.2	458.0	488.0	4863.2	4833.2	499.6	5.0	PVC	Regional Aquifer – SFG sediments	unk	
KAFB-0119	MW	5315.81	5315.6	452.3	482.3	4863.3	4833.3	482.0	4.0	PVC	Regional Aquifer – SFG sediments	unk	
KAFB-0120	MW	5289.49	5288.7	429.0	459.0	4859.7	4829.7	461.5	4.0	PVC	Regional Aquifer – SFG sediments	12-Jun-2006	
KAFB-0121	MW	5307.41	5305.0	445.8	475.8	4859.2	4829.2	480.8	4.0	PVC	Regional Aquifer – SFG sediments	24-Nov-2006	
KAFB-0213	MW	5282.18	5280.3	378.0	428.0	4902.3	4852.3	438.0	5.0	PVC	Regional Aquifer – SFG sediments	10-Jan-1984	
KAFB-0219	MW	5263.85	5262.7	396.0	426.0	4866.7	4836.7	428.5	4.0	PVC	Regional Aquifer – SFG sediments	08-Jun-2006	
KAFB-0220	MW	5264.72	5262.5	424.0	454.0	4838.5	4808.5	456.0	4.0	PVC/SS	Regional Aquifer – SFG sediments	15-Jul-2006	
KAFB-0221	MW	5274.22	5271.5	410.5	440.5	4861.0	4831.0	455.0	4.0	PVC	Regional Aquifer – SFG sediments	10-Jul-2006	
KAFB-0222	MW	5244.49	5245.2	366.0	396.0	4879.2	4849.2	401.0	4.0	PVC	Regional Aquifer – SFG sediments	unk	
KAFB-0223	MW	5251.38	5252.1	376.0	406.0	4876.1	4846.1	411.0	4.0	PVC	Regional Aquifer – SFG sediments	unk	
KAFB-0307	MW	5363.85	5362.7	405.0	450.0	4957.7	4912.7	460.0	3.8	PVC	Regional Aquifer – SFG sediments	04-Aug-1991	
KAFB-0308	MW	5381.08	5380.7	463.0	488.0	4917.7	4892.7	498.0	3.8	PVC	Regional Aquifer – SFG sediments	31-Jul-1991	
KAFB-0309	MW	5411.29	5410.7	500.0	525.0	4910.7	4885.7	535.0	4.0	PVC/SS	Regional Aquifer – SFG sediments	6-Jul-1992	
KAFB-0310	MW	5416.06	5413.2	400.0	445.0	5013.2	4968.2	455.0	3.8	PVC	PGWS – SFG sediments	27-Aug-1991	
KAFB-0311	MW	5352.74	5351.7	433.0	458.0	4918.7	4893.7	468.0	3.8	PVC	Regional Aquifer – SFG sediments	24-Jul-1992	
KAFB-0312	MW	5431.93	5430.2	503.0	528.0	4927.2	4902.2	533.0	4.5	PVC	Regional Aquifer – SFG sediments	26-Aug-1998	
KAFB-0313	MW	5418.58	5416.9	348.0	368.0	5068.9	5048.9	373.0	4.5	PVC	PGWS – SFG sediments	13-Aug-1998	
KAFB-0314	MW	5455.45	5453.9	428.0	448.0	5025.9	5005.9	453.0	4.5	PVC	Regional Aquifer – SFG sediments	30-Sep-1998	
KAFB-0315	MW	5466.53	5464.1	447.0	472.0	5017.1	4992.1	477.0	4.5	PVC	Regional Aquifer – SFG sediments	08-Sep-2000	

Table 1 (continued)
Inventory of Active and Decommissioned Site-Wide Groundwater Monitoring, Production, and Extraction Wells Located at Sandia National Laboratories, New Mexico[a], Kirtland Air Force Base, and Surrounding Areas

Well ID	Type	Measuring Point[b, c] (ft amsl, NAVD 88)	Ground Surface[c] (ft amsl, NAVD 88)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Top of Screen (ft amsl)	Bottom of Screen (ft amsl)	Casing Total Depth (ft bgs)	Casing, Inner Diameter (inches)	Casing Material	Lithology of Screened Interval	Installation Date	P&A Date, If Applicable
Kirtland Air Force Base/U.S. Air Force (Continued)													
KAFB-0417	MW	5317.25	5310.0	430.0	455.0	4880.0	4855.0	465.0	3.8	PVC	Regional Aquifer – SFG sediments	06-Jun-1992	
KAFB-0504	MW	5357.87	5356.9	470.0	490.0	4886.9	4866.9	500.0	4.0	PVC/SS	Regional Aquifer – SFG sediments	20-Jan-1990	
KAFB-0505	MW	5363.65	5360.8	495.4	520.5	4865.4	4840.3	521.3	4.5	PVC	Regional Aquifer – SFG sediments	22-Jul-1999	
KAFB-0506	MW	5363.62	5361.0	200.0	220.0	5161.0	5141.0	220.0	4.5	PVC	PGWS – SFG sediments	31-Aug-1998	
KAFB-0507R	MW	5358.56	5355.7	492.0	512.0	4863.7	4843.7	520.0	4.0	PVC	Regional Aquifer – SFG sediments	3-Apr-2013	
KAFB-0508	MW	5353.62	5349.7	481.0	506.0	4868.7	4843.7	507.0	3.5	PVC	Regional Aquifer – SFG sediments	02-May-2001	
KAFB-0509	MW	5441.56	5349.9	195.0	220.0	5149.9	5129.9	221.0	3.5	PVC	above PGWS – SFG sediments	10-May-2001	
KAFB-0510	MW	5372.30	5364.7	511.0	536.0	4853.7	4828.7	537.0	3.5	PVC	Regional Aquifer – SFG sediments	17-May-2001	
KAFB-0512R	MW	5302.73	5300.2	430.0	450.0	4870.2	4850.2	455.0	4.0	PVC	Regional Aquifer – SFG sediments	4-Apr-2013	
KAFB-0514	MW	5206.41	5204.7	340.0	365.0	4864.7	4839.7	366.0	3.5	PVC	Regional Aquifer – SFG sediments	17-May-2001	
KAFB-0516	MW	5205.64	5203.4	322.0	357.0	4881.4	4846.4	358.0	4.0	PVC	Regional Aquifer – SFG sediments	29-Jan-2002	
KAFB-0517	MW	5197.11	5194.6	325.0	350.0	4869.6	4844.6	352.0	4.0	PVC	Regional Aquifer – SFG sediments	08-Nov-2002	
KAFB-0518	MW	5177.88	5175.5	305.0	335.0	4870.5	4840.5	337.0	4.0	PVC	Regional Aquifer – SFG sediments	22-Dec-2002	
KAFB-0519	MW	5365.37	5362.7	700.0	725.0	4662.7	4637.7	727.0	5.0	PVC	Regional Aquifer – SFG sediments	12-May-2003	
KAFB-0520	MW	5250.09	5246.2	379.5	404.5	4866.7	4841.7	410.0	4.0	PVC	Regional Aquifer – SFG sediments	15-Jun-2004	
KAFB-0521[k]	MWF	FLUTe	5349.7	550.0[k]	655.0[k]	4799.7	4694.7	562.0	5.0	FLUTe™	Regional Aquifer – SFG sediments	7-May-2004	
KAFB-0522	MW	5270.06	5265.7	405.0	430.0	4860.7	4835.7	432.5	4.0	PVC	Regional Aquifer – SFG sediments	23-Jun-2004	
KAFB-0523	MW	5352.62	5350.5	600.0	625.0	4750.5	4725.5	627.0	4.0	PVC	Regional Aquifer – SFG sediments	unk	
KAFB-0524	MW	5345.83	5343.4	484.0	509.0	4859.4	4834.4	511.0	4.0	PVC	Regional Aquifer – SFG sediments	31-Oct-2006	
KAFB-0525	MW	5229.75	5227.9	371.0	396.0	4856.9	4831.9	398.0	4.0	PVC	Regional Aquifer – SFG sediments	19-Nov-2006	
KAFB-0602	Ext	5364.07	5364.2	437.0	457.0	4927.2	4907.2	467.0	4.0	PVC	PGWS – SFG sediments	20-Mar-90	
KAFB-0608	Ext	5359.80	5364.7	307.0	327.0	5052.9	5032.9	338.0	4.0	PVC	PGWS – SFG sediments	28-Mar-1990	
KAFB-0610	Ext	5359.22	5357.3	333.0	353.0	5024.3	5004.3	363.0	4.0	PVC	PGWS – SFG sediments	4-Apr-90	
KAFB-0611	MW	5386.08	5383.5	498.0	508.0	4885.5	4875.5	513.0	4.0	PVC	Regional Aquifer – SFG sediments	13-Nov-2002	
KAFB-0612	MW	5385.45	5383.5	290.0	315.0	5093.5	5068.5	317.0	4.0	PVC	PGWS – SFG sediments	21-Nov-2002	
KAFB-0613	MW	5390.78	5391.3	420.0	450.0	4971.3	4941.3	452.0	4.0	PVC	Regional Aquifer – SFG sediments	08-Dec-2002	
KAFB-0614	MW	5391.22	5391.4	360.0	370.0	5031.4	5021.4	372.0	4.0	PVC	PGWS – SFG sediments	12-Dec-2002	
KAFB-0615	MW	5638.43	5636.3	300.0	325.0	5336.3	5311.3	327.0	4.0	PVC	Bedrock (granite)	27-Nov-2002	
KAFB-0616	MW	5481.04	5478.7	472.0	497.0	5006.7	4981.7	499.0	4.0	PVC	Regional Aquifer – SFG sediments	24-Nov-2002	
KAFB-0617	MW	5506.07	5503.3	565.0	590.0	4938.3	4913.3	592.0	4.0	PVC	Regional Aquifer – SFG sediments	18-May-2004	
KAFB-0618	MW	5411.63	5408.2	535.0	560.0	4873.2	4848.2	562.0	4.0	PVC	Regional Aquifer – SFG sediments	15-Jun-2004	
KAFB-0619	MW	5412.37	5409.0	389.0	404.0	5020.0	5005.0	406.0	4.0	PVC	PGWS – SFG sediments	04-Jun-2004	
KAFB-0620	MW	5334.34	5332.0	447.0	472.0	4885.0	4860.0	474.5	4.0	PVC	Regional Aquifer – SFG sediments	18-Jun-2004	
KAFB-0621	MW	5568.89	5568.0	624.0	649.0	4944.0	4919.0	650.0	4.0	PVC	Regional Aquifer – SFG sediments	17-Jun-2004	
KAFB-0622	MW	5488.64	5486.2	529.0	554.0	4957.2	4932.2	555.0	4.0	PVC	Regional Aquifer – SFG sediments	25-Jun-2004	
KAFB-0623	MW	5328.94	5327.0	265.0	290.0	5062.0	5037.0	292.5	4.0	PVC	PGWS – SFG sediments	29-Jun-2004	
KAFB-0624	MW	5674.15	5671.1	765.0	790.0	4906.1	4881.1	792.5	3.8	PVC	Regional Aquifer – SFG sediments	31-Oct-2008	
KAFB-0625	MW	5390.23	5387.5?	470.0	495.0	4917.5?	4892.5?	497.5	4.0	unk	Regional Aquifer – SFG sediments	unk	

Table 1 (continued)
Inventory of Active and Decommissioned Site-Wide Groundwater Monitoring, Production, and Extraction Wells Located at Sandia National Laboratories, New Mexico[a], Kirtland Air Force Base, and Surrounding Areas

Well ID	Type	Measuring Point[b, c] (ft amsl, NAVD 88)	Ground Surface[c] (ft amsl, NAVD 88)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Top of Screen (ft amsl)	Bottom of Screen (ft amsl)	Casing Total Depth (ft bgs)	Casing, Inner Diameter (inches)	Casing Material	Lithology of Screened Interval	Installation Date	P&A Date, If Applicable
Kirtland Air Force Base/U.S. Air Force (Continued)													
KAFB-0626[k]	MWF	5331.21	5328.8	425.0[k]	629.0[k]	4903.8	4699.8	638.4	5.0	FLUTe	Regional Aquifer – SFG sediments	20-Aug-2010	
KAFB-0901	MW	5390.07	5389.8	465.0	527.0	4924.8	4862.8	537.0	4.0	PVC	Regional Aquifer – SFG sediments	15-Mar-1990	
KAFB-0902	MW	5229.97	5228.0	337.0	357.0	4891.0	4871.0	367.0	4.0	PVC	Regional Aquifer – SFG sediments	20-Feb-1990	28-Feb-2000
KAFB-0903	MW	5391.63	5389.4	225.0	250.0	5164.4	5139.4	251.0	4.0	PVC	above PGWS – SFG sediments	3-Apr-2002	
KAFB-0904	MW	5291.75	5289.3?	343.0	368.0	4946.3?	4921.3?	368.0	4.0	PVC	Regional Aquifer – SFG sediments	2002	
KAFB-1001	MW	5260.43	5255.7	342.0	367.0	4913.7	4888.7	377.0	4.0	PVC/SS	Regional Aquifer – SFG sediments	19-Apr-1992	
KAFB-1002	MW	5254.75	5252.7	342.0	367.0	4910.7	4885.7	377.0	4.0	PVC/SS	Regional Aquifer – SFG sediments	30-Mar-1992	
KAFB-1003	MW	5258.29	5257.7	345.0	370.0	4912.7	4887.7	380.0	4.0	PVC/SS	Regional Aquifer – SFG sediments	21-May-1992	
KAFB-1004	MW	5258.81	5267.7	348.0	373.0	4919.7	4894.7	383.0	4.0	PVC/SS	Regional Aquifer – SFG sediments	24-Aug-1992	
KAFB-1005	MW	5274.68	5287.7	363.0	388.0	4924.7	4899.7	398.0	4.0	PVC/SS	Regional Aquifer – SFG sediments	26-May-1992	
KAFB-1006	MW	5257.01	5257.0	363.0	383.0	4894.0	4874.0	383.0	4.0	SS	Regional Aquifer – SFG sediments	10-Aug-1996	
KAFB-1007R	MW	5260.80	5258.4	376.5	396.5	4881.9	4861.9	401.5	4.0	PVC	Regional Aquifer – SFG sediments	18-May-2013	
KAFB-1008	MW	5260.77	5258.8	367.6	397.6	4891.2	4861.2	400.0	4.0	PVC	Regional Aquifer – SFG sediments	unk	
KAFB-1009	MW	5272.16	5271.8	392.7	422.7	4879.1	4849.1	427.7	4.0	PVC	Regional Aquifer – SFG sediments	unk	
KAFB-1021	MW	5348.02	5348.0	479.0	504.0	4869.0	4844.0	505.0	4.0	PVC	Regional Aquifer – SFG sediments	17-Mar-2002	
KAFB-1901	MW	5751.58	5748.7	80.5	105.5	5668.2	5643.2	115.5	4.0	PVC/SS	Regional Aquifer – SFG sediments	30-Jun-1992	
KAFB-1902	MW	5754.27	5752.7	80.7	105.7	5672.0	5647.0	115.7	4.0	PVC/SS	Regional Aquifer – SFG sediments	9-Jul-1992	
KAFB-1904	MW	5752.29	5750.0?	84.3	104.3	5665.7?	5645.7?	104.3	4.0	SS	Regional Aquifer – SFG sediments	1992?	
KAFB-2005	MW	5624.27	5624.6	126.0	156.0	5498.6	5468.6	158.5	4.0	PVC	Bedrock (granite)	10-May-2006	
KAFB-2006	MW	5590.88	5591.0?	303.0	333.0	5288.0?	5258.0?	335.0	4.0	PVC	Bedrock (granite)	10-May-2006	
KAFB-2007	MW	5564.48	5562.1	273.0	303.0	5289.1	5259.1	305.5	4.0	PVC	Bedrock (granite)	13-May-2006	
KAFB-2008	MW	5541.62	5539.5	650.0	680.0	4889.5	4859.5	688.0	5.0	PVC	Regional Aquifer – SFG sediments	15-Oct-2010	
KAFB-2009	MW	5655.63	5653.4	74.0	104.0	5579.4	5549.4	110.0	4.0	PVC	Bedrock (granite)	15-Oct-2010	
KAFB-2622	MW	5360.17	5356.5	195.0	215.0	5161.5	5141.5	217.0	4.0	PVC	PGWS – SFG sediments	02-Dec-2004	
KAFB-2623	MW	5369.28	5365.3	199.8	219.8	5165.5	5145.5	221.8	4.0	PVC	PGWS – SFG sediments	30-Dec-2004	
KAFB-2624	MW	5364.21	5359.6	195.0	215.0	5164.6	5144.6	217.0	4.0	PVC	PGWS – SFG sediments	2013?	
KAFB-2625	MW	5356.62	5357.4	185.0	205.0	5172.4	5152.4	207.0	4.0	PVC	PGWS – SFG sediments	2010?	
KAFB-2626	MW	5357.55	5355.6	185.0	205.0	5170.6	5150.6	208.0	4.0	PVC	PGWS – SFG sediments	22-Feb-2009	
KAFB-2627	MW	5367.51	5365.5	195.0	215.0	5170.5	5150.5	217.5	4.0	PVC	PGWS – SFG sediments	2-Mar-2009	
KAFB-2628	MW	5369.44	5367.4	506.0	530.0	4861.4	4837.4	535.0	5.0	PVC	Regional Aquifer – SFG sediments	2-Aug-2011	
KAFB-2629	MW	5361.66	5359.2	496.0	519.5	4863.2	4839.7	523.5	5.0	PVC	Regional Aquifer – SFG sediments	9-Aug-2011	
KAFB-2630	MW	5361.78	5359.2	205.9	225.7	5153.3	5133.5	227.9	4.0	PVC	above PGWS – SFG sediments	20-Aug-2011	
KAFB-2631	MW	5336.14	5335.5	154.3	174.1	5181.2	5161.4	176.3	4.0	PVC	above PGWS – SFG sediments	16-Aug-2011	
KAFB-2632	MW	5329.58	5328.8	157.4	177.2	5171.4	5151.6	179.4	4.0	PVC	above PGWS – SFG sediments	11-Aug-2011	
KAFB-2901	MW	5839.08	5836.7	121.0	141.0	5715.7	5695.7	146.0	4.0	PVC	Regional Aquifer – SFG sediments	31-May-2015	
KAFB-2902	MW	5832.10	5829.7	160.0	180.0	5669.7	5649.7	185.0	4.0	PVC	Regional Aquifer – SFG sediments	9-May-2015	
KAFB-2903	MW	5819.46	5817.0	165.0	185.0	5652.0	5632.0	190.0	4.0	PVC	Bedrock (Abo Formation) siltstone and shale	11-Jun-2015	
KAFB-2904	MW	5842.72	5840.4	58.0	78.0	5782.4	5762.4	83.0	4.0	PVC	Bedrock (Madera Formation) limestone	14-Jun-2015	

Table 1 (continued)
Inventory of Active and Decommissioned Site-Wide Groundwater Monitoring, Production, and Extraction Wells Located at Sandia National Laboratories, New Mexico[a], Kirtland Air Force Base, and Surrounding Areas

Well ID	Type	Measuring Point[b, c] (ft amsl, NAVD 88)	Ground Surface[c] (ft amsl, NAVD 88)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Top of Screen (ft amsl)	Bottom of Screen (ft amsl)	Casing Total Depth (ft bgs)	Casing, Inner Diameter (inches)	Casing Material	Lithology of Screened Interval	Installation Date	P&A Date, If Applicable
Kirtland Air Force Base/U.S. Air Force (Continued)													
KAFB-3391	MW	5396.19	5394.1	262.3	282.3	5131.8	5111.8	284.3	4.0	PVC	PGWS – SFG sediments	1-Aug-1998	
KAFB-3392	MW	5394.51	5393.4	536.0	561.0	4857.4	4832.4	562.0	4.0	PVC	Regional Aquifer – SFG sediments	08-Oct-1999	
KAFB-3411	MW	5342.81	5340.5	477.0	502.0	4863.5	4838.5	503.0	4.0	PVC	Regional Aquifer – SFG sediments	11-Nov-1999	
KAFB-6241	MW	5466.50	5463.2	528.0	553.0	4935.2	4910.2	555.0	4.0	PVC	Regional Aquifer – SFG sediments	16-Jan-2007	
KAFB-6243	MW	5423.48	5421.0	488.0	513.0	4933.0	4908.0	516.0	4.0	unk	Regional Aquifer – SFG sediments	2009?	
KAFB-6301	MW	5459.64	5457.3	535.0	560.0	4922.3	4897.3	561.0	4.0	PVC	Regional Aquifer – SFG sediments	7-Sep-1999	
KAFB-7001	MW	5322.94	5323.0?	454.0	479.0	4869.0?	4844.0?	480.0	4.0	PVC	Regional Aquifer – SFG sediments	before 2011	
KAFB-8281	MW	5401.03	5401.7	544.0	569.0	4857.7	4832.7	570.0	4.0	PVC	Regional Aquifer – SFG sediments	27-Oct-1999	
KAFB-8282	MW	5402.92	5403.4	262.0	287.0	5141.4	5116.4	288.0	4.0	PVC	PGWS – SFG sediments	1999?	
KAFB-8351	MW	5325.62	5323.3	474.0	499.0	4849.3	4824.3	505.0	4.0	PVC	Regional Aquifer – SFG sediments	23-Nov-1999	
KAFB-ST105-EX01	MW	5353.54	5348.5	505.0	575.0	4843.5	4773.5	575.0	10.0	PVC/SS	Regional Aquifer – SFG sediments	2008?	
KAFB-WYO-5	MW	5393.36	5390.3	286.0	306.0	5104.3	5084.3	306.4	3.0	PVC	PGWS – SFG sediments	21-Aug-2024	
KAFB-WYO-6	MW	5393.79	5390.9	273.0	293.0	5117.9	5097.9	293.4	3.0	PVC	PGWS – SFG sediments	21-Aug-2024	
KAFB-WYO-7	MW	5391.73	5388.2	298.0	318.0	5090.2	5070.2	318.4	3.0	PVC	PGWS – SFG sediments	21-Aug-2024	
Site 58 MW-1	MW	5721.57	5718.4?	46.8	71.8	5671.6?	5646.6?	71.8	2.0	PVC	Colluvium and Bedrock (granite)	2001?	
Site 58 MW-2	MW	5715.86	5715.9	76.7	96.7	5639.2	5619.2	96.7	2.0	PVC	Bedrock (granite)	2001?	
Site 58 MW-3	MW	5718.08	5717.9	52.0	72.0	5665.9	5645.9	72.0	2.0	PVC	Colluvium?	2001?	
Site 58 MW-4	MW	5722.27	5719.8?	55.5	75.5	5664.3?	5644.3?	75.5	2.0	PVC	Bedrock (granite)	2001?	
Site 58 MW-5	MW	5716.99	5716.8	25.0	65.0	5691.8	5651.8	80.0	4.0	PVC	Colluvium?	2001?	
Site 58 MW-6	MW	5719.62	5717.8?	57.0	82.0	5660.8?	5635.8?	87.0	2.0	PVC	Colluvium and Bedrock (granite)?	2001?	
Site 58 MW-7	MW	5717.70	5715.3?	50.0	75.0	5665.3?	5640.3?	80.0	2.0	PVC	Colluvium and Bedrock (granite)?	2001?	
ST105-MW001	MW	5279.34	5276.6	408.0	428.0	4868.6	4848.6	433.4	4.0	PVC	Regional Aquifer – SFG sediments	11-Mar-2103	
ST105-MW002	MW	5180.32	5177.8	308.4	328.4	4869.4	4849.4	333.4	4.0	PVC	Regional Aquifer – SFG sediments	25-Feb-2013	
ST105-MW003	MW	5174.61	5171.9	301.0	321.0	4870.9	4850.9	326.0	4.0	PVC	Regional Aquifer – SFG sediments	28-Feb-2013	
ST105-MW004	MW	5234.86	5232.2	365.0	385.0	4867.2	4847.2	390.4	4.0	PVC	Regional Aquifer – SFG sediments	11-Feb-2013	
ST105-MW005	MW	5287.57	5284.9	273.0	293.0	5011.9	4991.9	298.0	4.0	PVC	Regional Aquifer – SFG sediments	24-May-2103	
ST105-MW006	MW	5313.19	5310.7	228.0	248.0	5082.7	5062.7	253.0	4.0	PVC	PGWS – SFG sediments	25-Feb-2013	
ST105-MW007	MW	5311.18	5308.5	290.0	310.0	5018.5	4998.5	315.0	4.0	PVC	Regional Aquifer – SFG sediments	24-Feb-2013	
ST105-MW008	MW	5359.14	5356.5	456.0	476.0	4900.5	4880.5	481.0	4.0	PVC	Regional Aquifer – SFG sediments	23-Mar-2013	
ST105-MW009	MW	5519.08	5517.5	480.0	500.0	5037.5	5017.5	505.0	4.0	PVC	Regional Aquifer – SFG sediments	16-Nov-2013	
ST105-MW010	MW	5334.70	5332.1	436.5	456.5	4895.6	4875.6	461.5	4.0	PVC	Regional Aquifer – SFG sediments	1-Jun-2013	
ST105-MW011	MW	5422.23	5420.0	456.8	476.8	4963.2	4943.2	482.3	4.0	PVC	Regional Aquifer – SFG sediments	10-Apr-2013	
ST105-MW012	MW	5419.90	5417.1	375.0	395.0	5042.1	5022.1	401.0	4.0	PVC	PGWS – SFG sediments	17-Apr-2013	
ST105-MW013	MW	5446.71	5444.5	433.6	453.6	5010.9	4990.9	458.6	4.0	PVC	Regional Aquifer – SFG sediments	17-Apr-2013	
ST105-MW015	MW	5623.29	5621.2	687.0	707.0	4934.2	4914.2	712.0	4.0	PVC	Regional Aquifer – SFG sediments	8-May-2013	
ST105-MW017	MW	5617.90	5619.6	702.0	722.0	4917.6	4897.6	727.0	4.0	PVC	Regional Aquifer – SFG sediments	15-Jun-2013	
ST105-MW018	MW	5222.12	5218.8	349.2	369.2	4869.6	4849.6	374.6	4.0	PVC	Regional Aquifer – SFG sediments	10-Mar-2013	
ST105-MW019	MW	5217.94	5215.2	345.0	365.0	4870.2	4850.2	370.4	4.0	PVC	Regional Aquifer – SFG sediments	5-Mar-2013	

Table 1 (continued)
Inventory of Active and Decommissioned Site-Wide Groundwater Monitoring, Production, and Extraction Wells Located at Sandia National Laboratories, New Mexico[a], Kirtland Air Force Base, and Surrounding Areas

Well ID	Type	Measuring Point[b, c] (ft amsl, NAVD 88)	Ground Surface[c] (ft amsl, NAVD 88)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Top of Screen (ft amsl)	Bottom of Screen (ft amsl)	Casing Total Depth (ft bgs)	Casing, Inner Diameter (inches)	Casing Material	Lithology of Screened Interval	Installation Date	P&A Date, If Applicable
Kirtland Air Force Base/U.S. Air Force (Continued)													
ST105-MW020	MW	5383.35	5381.0	281.0	301.0	5100.0	5080.0	306.0	4.0	PVC	PGWS – SFG sediments	25-Apr-2013	
ST105-MW021	MW	5390.75	5388.4	290.0	310.0	5098.4	5078.4	315.0	4.0	PVC	PGWS – SFG sediments	6-Apr-2013	
ST105-MW022	MW	5386.64	5383.9	472.0	492.0	4911.9	4891.9	502.3	4.0	PVC	Regional Aquifer – SFG sediments	10-Apr-2013	
ST105-MW023	MW	5275.86	5273.3	406.0	426.0	4867.3	4847.3	431.0	4.0	PVC	Regional Aquifer – SFG sediments	4-Nov-2013	
ST105-MW024	MW	5595.67	5593.3	442.0	462.0	5151.3	5131.3	467.0	4.0	PVC	Bedrock (granite)	21-Nov-2013	
Production, Injection, and Extraction Wells													
ASL-PD	P	6030.00	6030.0	337.0	401.6	5693.0	5628.4	401.6	4.0	PVC	Bedrock (granite)	11-Jan-1990	
Burn Site Well	Px	6374.66	6372.9	231.0	341.0	6141.9	6031.9	341.0	4.0	PVC	Bedrock (schist and granite)	20-Feb-1986	Inactive 2003
Burton 1	P	unk	5317.7	676.0	1292.0	4641.7	4025.7	1312.0	18.0	S	Regional Aquifer – SFG sediments	1-Nov-1985	
Burton 2	P	unk	5286.7	425.0	845.0	4861.7	4441.7	845.0	16.0	S	Regional Aquifer – SFG sediments	1-Jan-1962	
Burton 3	P	unk	5217.7	358.0	994.0	4859.7	4223.7	996.0	16.0	S	Regional Aquifer – SFG sediments	1-Jan-1962	
Burton 4	P	unk	5276.2	636.0	1286.0	4640.2	3990.2	1286.0	20.0	S	Regional Aquifer – SFG sediments	28-Jul-1987	
Burton 5	P	unk	5352.7	550.0	1150.0	4802.7	4202.7	1170.0	unk	S	Regional Aquifer – SFG sediments	19-Aug-1991	
Greystone Well	P	5822.87	5820.8	44.0	54.0	5776.8	5766.8	54.0	4.0	PVC/S	Alluvium	1902?	12-Sep-2002
KAFB-1	P	unk	5386.5	550.0	1199.0	4836.5	4187.5	1199.0	12.0	S	Regional Aquifer – SFG sediments	1-Aug-1949	Dec-2016
KAFB-2	P	5327.06	5327.1	494.0	1000.0	4833.1	4327.1	1000.0	12.0	S	Regional Aquifer – SFG sediments	Jan-1951	Dec-2016
KAFB-3	P	unk	5356.9	452.0	900.0	4904.9	4456.9	900.0	14.0	S	Regional Aquifer – SFG sediments	01-Oct-1949	
KAFB-4	P	unk	5360.2	494.0	1000.0	4866.2	4360.2	1000.0	14.0	S	Regional Aquifer – SFG sediments	01-Dec-1949	
KAFB-5	P	unk	5439.0	504.0	1004.0	4935.0	4435.0	1004.0	14.0	S	Regional Aquifer – SFG sediments	1-Jul-1952	1999
KAFB-6	P	unk	5423.5	504.0	1006.0	4919.5	4421.5	1006.0	14.0	S	Regional Aquifer – SFG sediments	1-Jul-1952	1999
KAFB-7	INJ	unk	5350.4	448.0	976.0	4902.4	4374.4	976.0	16.0	S	Regional Aquifer – SFG sediments	1-Feb-1955	
KAFB-8	P	5372.00	5372.0	440.0	975.0	4932.0	4397.0	1000.0	14.0	S	Regional Aquifer – SFG sediments	1-Feb-1955	1999
KAFB-9	P	5501.19	5501.2	unk	unk	unk	4851.2?	650.0	10.0	S	Regional Aquifer – SFG sediments	1-Oct-1949	1970
KAFB-10	P	5418.65	5418.7	495.0	970.0	4923.7	4448.7	970.0	12.8	S	Regional Aquifer – SFG sediments	27-May-1959	Apr-1996
KAFB-11	P	5470.67	5481.0	670.0	1327.0	4811.0	4154.0	1327.0	16.0	S	Regional Aquifer – SFG sediments	10-Apr-1972	Dec-2016
KAFB-12	P	5322.87	5324.2	446.0	1032.0	4878.2	4292.2	1032.0	16.0	S	Regional Aquifer – SFG sediments	1-Oct-1952	1999
KAFB-13	P	5305.67	5307.0	413.0	953.0	4894.0	4354.0	977.0	14.0	S	Regional Aquifer – SFG sediments	1-Mar-1956	1999
KAFB-14	P	5324.67	5324.2	380.0	1000.0	4944.2	4324.2	1000.0	16.0	S	Regional Aquifer – SFG sediments	01-Jan-1969	
KAFB-15	P	unk	5347.0	697.0	993.0	4650.0	4354.0	1600.0	30.0	S	Regional Aquifer – SFG sediments	1996	
KAFB-16	P	unk	5370.0	697.0	993.0	4673.0	4377.0	1600.0	30.0	S	Regional Aquifer – SFG sediments	1996	
KAFB-17 (Heliport #1)	Px	unk	5301.7	530.0	598.0	4771.7	4703.7	598.0	6.0	SS	Regional Aquifer – SFG sediments	1992	Dec-2016
KAFB-18 (SOR)[l]	Px	5965.70	5965.7	160.0	320.0	5805.7	5645.7	320.0	5.0	PVC	Bedrock (metarhyolite)	19-Aug-1987	
KAFB-19 (HERTF)	P	unk	6229.7	449.0	500.0	5780.7	5729.7	500.0	5.0	S/OH?	Bedrock (granite)	13-Jul-1990	2008
KAFB-20	P	unk	5389.0	710.0	1180.0	4679.0	4209.0	1240.0	20.0	S	Regional Aquifer – SFG sediments	Jan-2008	
KAFB-PG-1598[m]	Ext	5369.90	5368.4	290.0	440.0	5078.4	4928.4	455.0	12.0	SS	PGWS – SFG sediments	14-Oct-1998	
KAFB-0602	Ext	5365.47	5364.2	437.0	457.0	4927.2	4907.2	467.0	4.0	PVC/SS	PGWS – SFG sediments	20-Mar-1990	
KAFB-0608	Ext	5361.17	5359.9	307.0	327.0	5052.9	5032.9	338.0	4.0	PVC/SS	PGWS – SFG sediments	28-Mar-1990	

Table 1 (continued)
Inventory of Active and Decommissioned Site-Wide Groundwater Monitoring, Production, and Extraction Wells Located at Sandia National Laboratories, New Mexico[a], Kirtland Air Force Base, and Surrounding Areas

Well ID	Type	Measuring Point[b, c] (ft amsl, NAVD 88)	Ground Surface[c] (ft amsl, NAVD 88)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Top of Screen (ft amsl)	Bottom of Screen (ft amsl)	Casing Total Depth (ft bgs)	Casing, Inner Diameter (inches)	Casing Material	Lithology of Screened Interval	Installation Date	P&A Date, If Applicable
Production, Injection, and Extraction Wells (Continued)													
KAFB-0609	Ext	5365.87	5364.7	316.0	336.0	5048.7	5028.7	345.0	4.0	PVC/SS	PGWS – SFG sediments	31-Mar-1990	22-Jun-2014
KAFB-0610	Ext	5359.47	5357.3	333.0	353.0	5024.3	5004.3	363.0	4.0	PVC/SS	PGWS – SFG sediments	04-Apr-1990	
KAFB-106228	Ext	5319.62	5322.9	440.0	540.0	4882.9	4782.9	545.0	8.0	SS	Regional Aquifer – SFG sediments	2-June-2015	
KAFB-106233	Ext	5312.20	5315.5	430.0	532.1	4885.5	4783.4	537.1	8.0	SS	Regional Aquifer – SFG sediments	30-Sep-2015	
KAFB-106234	Ext	5323.07	5326.3	439.7	539.7	4886.6	4786.6	544.7	8.0	SS	Regional Aquifer – SFG sediments	9-Oct-2015	
KAFB-106239	Ext	5330.09	5333.4	470.0	570.0	4863.4	4763.4	575.0	8.0	SS	Regional Aquifer – SFG sediments	3-May-2017	
KAFB-106IN2	Inj	5370.84	5367.0	605.0	905.0	4762.0	4462.0	910.0	12.8	S	Regional Aquifer – SFG sediments	19-Oct-2020	
Lake Christian West[n]	Px	5716.61	5715.7	60.0	72.0	5655.7	5643.7	72.0	6.0	S	Sandstone	1982?	2004?
Lomas 1	P	unk	5597.7	700.0	1300.0	4897.7	4297.7	1341.0	16.0	S	Regional Aquifer – SFG sediments	1962	
Lomas 2	P	unk	5582.7	743.0	1539.0	4835.0	4039.0	1590.0	16.0	S	Regional Aquifer – SFG sediments	1973	
Lomas 5	P	unk	5496.7	823.0	1651.0	4876.0	3848.0	1670.0	18.0	S	Regional Aquifer – SFG sediments	3-Nov-1978	
Lomas 6	P	unk	5532.0	876.0	1688.0	4657.0	3845.0	1704.0	18.0	S	Regional Aquifer – SFG sediments	1978	
Love 2	P	unk	5444.0	740.0	1536.0	4704.0	3908.0	1548.0	16.0	S	Regional Aquifer – SFG sediments	1958	
Love 5	P	5392.67	5392.7	660.0	1248.0	4732.7	4144.7	1248.0	16.0	S	Regional Aquifer – SFG sediments	19-Jun-1958	
Miles 1	P	unk	5148.7	404.5	1153.5	4744.2	3995.2	1165.5	16.0	S	Regional Aquifer – SFG sediments	6-Jun-1974	
Ridgecrest 1	P	unk	5444.7	636.0	1260.0	4808.7	4184.7	1260.0	16.0	S	Regional Aquifer – SFG sediments	13-Jan-1964	
Ridgecrest 2	P	unk	5418.7	730.0	1500.0	4688.7	3918.7	1543.0	16.0	S	Regional Aquifer – SFG sediments	1-Jan-1977	
Ridgecrest 3	P	unk	5387.7	621.0	1436.0	4766.7	3951.7	1449.0	16.0	S	Regional Aquifer – SFG sediments	01-May-1974	
Ridgecrest 4	P	unk	5346.7	573.0	1413.0	4773.7	3933.7	1450.0	unk	S	Regional Aquifer – SFG sediments	01-Mar-1974	
Ridgecrest 5	P	unk	5356.7	650.0	1,450.0	4706.7	3906.7	1450.0	20.0	S	Regional Aquifer – SFG sediments	8-Dec-1990	
RG-01091	Px	unk	5602.0?	650.0	1180.0	4952.0?	4422.0?	1200.0	18.0	S	Fractured limestone, metamorphics, igneous	1-Sep-1957	
RG-39652	P	unk	7070.0?	163.0	263.0	6907.0?	6807.0?	263.0	3.0	PVC	Bedrock (limestone)	6-Mar-2013	
RG-40129	P	unk	7265.0?	240.0	340.0	7025.0?	6925.0?	340.0	5.0	unk	Bedrock (limestone)	18-Jul-1983	
RG-44737	P	unk	6021.0?	unk	unk	unk	unk	100.0?	5.0?	unk	Bedrock (metamorphics?)	1986?	Aug-1991
RG-58935-3	P	unk	6260.0?	160.0	480.0	6100.0?	5780.0?	480.0	4.0	PVC	Bedrock (metamorphics)	2017?	
RG-61206	P	unk	6320.0?	100.0	500.0	6220.0?	5820.0?	500.0	4.0	PVC	Bedrock (metamorphics)	18-Dec-1994	
RG-61207	P	unk	6370.0?	100.0	480.0	6270.0?	5890.0?	500.0	4.0	PVC	Bedrock (metamorphics)	17-Dec-1994	
RG-76274	P	unk	6280.0?	180.0	540.0	6100.0?	5740.0?	540.0	4.5	PVC	Bedrock (granite and metamorphics?)	3-Sep-2001	
School House Well	P	5796.33	5799.0	83.0	103.0	5716.0	5696.0	103.0	6.0	S/OH	Bedrock (Sandia Formation) sandstone?	1930s?	inactive
TSA-1	P	6063.68	6060.2	190.0	210.0	5870.2	5850.2	300.0	6.0	S	Bedrock (metamorphics)	10-Nov-1987	Aug-2001
VA-1	P	unk	5344.0	unk	unk	unk	unk	unk	unk	unk	Regional Aquifer – SFG sediments	1940?	1997?
VA-2	P	unk	5346.2?	590.0	990.0	4756.2?	4356.2?	1010.0	13.4	SS	Regional Aquifer – SFG sediments	18-Apr-1997	
Yale 1	P	unk	5161.7	336.0	960.0	4825.7	4201.7	960.0	16.0	S	Regional Aquifer – SFG sediments	30-Nov-1963	
Yale 2	P	unk	5138.7	357.0	1185.0	4781.7	3953.7	1185.0	16.0	S	Regional Aquifer – SFG sediments	1-Jan-1972	
Yates Well	P	6104.67	6102.7	unk	unk	unk	unk	unk	unk	S	Bedrock (granite)	1929	1942?

Table 1 (concluded)
Inventory of Active and Decommissioned Site-Wide Groundwater Monitoring, Production, and Extraction Wells Located at Sandia National Laboratories, New Mexico[a], Kirtland Air Force Base, and Surrounding Areas

Notes:

[a] The status of all SNL/NM-installed groundwater wells is maintained in this table. However, not all of the decommissioned (P&A) groundwater wells for KAFB are listed.

[b] Measuring point is the elevation for the top of well casing, typically the top of PVC casing, that is used for measuring and calculating groundwater elevations.

[c] Elevations are relative to the NAVD 88, New Mexico State Plane Coordinate System, Central Zone. Elevation data from other government agencies that were based on the National Geodetic Vertical Datum of 1929 were converted (re-projected) by +2.671 ft.

[d] MWL-MW4 well casing was installed at 6 degrees from vertical. Casing depths were measured during well installation and are not corrected for true vertical (perpendicular to the ground surface) distance of the slant hole. The well has two screens: 488.4 to 508.4 ft bgs and 528.4 to 548.4 ft bgs.

[e] The casings for SFR-1D and SFR-1S were installed in a single borehole.

[f] PGS-2 has three screens: 535 to 565 ft bgs, 585 to 595 ft bgs, and 625 to 645 ft bgs. Groundwater samples were collected from the upper screen.

[g] TA2-NW1-595 has two screens: 535 to 555 ft bgs, and 585 to 595 ft bgs. Groundwater samples were collected from the upper screen.

[h] TJA-4 is screened in the Merging Zone. The Merging Zone refers to layers of saturation near Tijeras Arroyo, typically between the PGWS and the Regional Aquifer.

[i] TAV-INJ1 is a nested well with two PVC casings installed in a single borehole. The 5-inch diameter monitoring screen extends from 509 to 539 ft bgs. The 1.5-inch diameter injection screen extends from 519 to 539 ft bgs. The primary sandpack (2-millimeter SilLibeads®) extends from 504 to 544.5 ft bgs. Injections were conducted from November 2018 through April 2019. TAV-INJ1 was formally reclassified as a monitoring well by the New Mexico Environment Department on 12 October 2021.

[j] Many of the Bulk Fuels Facility (BFF) monitoring wells, such as KAFB-1062, are not shown in order to reduce clutter on the AGMR figures and Plate 1. The BFF plume does not impact groundwater quality at SNL/NM.

[k] KAFB-0521 and KAFB-0626 were constructed with a FLUTe™ monitoring system with multiple sampling ports. Groundwater elevations cannot be measured. Sample tubing (0.25-inch diameter) for the ports was installed in 5-inch diameter PVC casings. KAFB-0521 has ports set at 550 to 555, 600 to 605, and 650 to 655 ft bgs. KAFB-0626 has ports set at 425, 471, 515, and 629 ft bgs.

[l] Production well KAFB-18 (non-potable) is also known as the Optical Range Well or the Starfire Optical Range Well.

[m] The production-non-potable well (water supply well) KAFB-PG-1598 is also known as the Golf Course Main Pond Well. Some KAFB documents also use the identifier RG-1598-S-4 or RG-1589-S-4. Pumped water is used for irrigating the KAFB Tijeras Arroyo Golf Course.

[n] Lake Christian West is also known as well KAFB-1903. The well was used for non-potable purposes, including the filling of a USAF high-explosives testing pond located approximately 1,600 ft to the east of the well.

AGMR	= annual groundwater monitoring report
amsl	= above mean sea level
ASL-PD	= Albuquerque Seismological Laboratory Production
AVN	= Area-V (North)
bgs	= below ground surface
BW	= Background Well
CCBA	= Coyote Canyon Blast Area
CTF	= Coyote Test Field
CWL	= Chemical Waste Landfill
CYN	= Canyons (Lurance Canyon area)
D	= deep
Dual PVC	= Two PVC casings in one borehole.
EX	= Well proposed for extraction purposes but used for monitoring purposes only. This applies to the well number for KAFB-ST105-EX01.
Ext	= Extraction well used for remediating groundwater at the KAFB Bulk Fuels Facility and the KAFB Tijeras Arroyo Golf Course.
ft	= feet or foot
FLUTe™	= Flexible Liner Underground Technologies, LLC
HERTF	= High Energy Research Test Facility
ID	= identifier
INJ	= Injection
KAFB	= Kirtland Air Force Base
L	= lower screen (term used at the CWL)
LMF	= Large Melt Facility
LWDS	= Liquid Waste Disposal System
MRN	= Magazine Road North
MW	= Monitoring Well
MWF	= Monitoring Well FLUTe™
MWL	= Mixed Waste Landfill
NAVD 88	= North American Vertical Datum of 1988
NWTA3	= Northwest Technical Area-III
OBS	= Old Burn Site (in Coyote Test Area)
P	= Production well (water supply well) used for potable purposes.
P&A	= plugged and abandoned (decommissioned)
Px	= Production well (water supply well) used for non-potable purposes, such as irrigating the golf course.
PGS	= Parade Ground South
PGWS	= Perched Groundwater System (more details are presented in Table 2)
PL	= Power Line Road (northwest of Technical Area-III). The better-known Power Line Road (also known as Pole Line Road) is near the Tijeras Arroyo Golf Course.
PVC	= polyvinyl chloride
PVC/S	= Composition of blank well casing is PVC and composition of well screen is steel (carbon steel).
PVC/SS	= Composition of blank well casing is PVC and composition of well screen is stainless steel.
R	= Replacement well (term used by KAFB)
RG	= Rio Grande
S	= shallow
S	= steel (carbon steel)
S/OH	= Open hole completion (no well screen) with blank casing above.
S/SS	= Composition of blank well casing is carbon steel and composition of well screen is stainless steel.
SFG	= Santa Fe Group
SFR	= South Fence Road
SNL/NM	= Sandia National Laboratories, New Mexico
SOR	= Starfire Optical Range
SS	= stainless steel
ST105	= Series of KAFB/USAF wells for nitrate abatement study.
STW	= Solar Tower West
SWTA3	= Southwest Technical Area-III
TA1-W	= Technical Area-I (Well)
TA2-NW	= Technical Area-II (Northwest)
TA2-SW	= Technical Area-II (Southwest)
TA2-W	= Technical Area-II (Well)
TAV	= Technical Area-V (monitoring well designation)
TJA	= Tijeras Arroyo
TRE	= Thunder Road East
TRN	= Target Road North
TRS	= Target Road South
TSA	= Transportation Safeguards Academy
U	= upper screen (term used at CWL)
unk	= Unknown information, not available.
USAF	= U.S. Air Force
VA	= Veterans Administration (previously Veterans Affairs)
WYO	= Wyoming Boulevard
YALE	= Yale Landfill area
?	= Accuracy of information or interpretation is questionable.
12AUP	= Environmental Restoration Site 12A underflow piezometer

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Table 2
Site-Wide Groundwater Elevations for Active Monitoring Wells Located at Sandia National Laboratories, New Mexico and the Kirtland Air Force Base Vicinity for Calendar Year 2024

Well ID	Measuring Point [a, b, c] (ft amsl, NAVD 88)	Date Measured (2024) [d]	Depth to Water (ft btoc, 2024)	Groundwater Elevation (ft amsl, 2024)	Groundwater Elevation, rounded (ft amsl, 2024)	Screened Unit	Comment, as needed	Data Source	Well Owner
DOE/NNSA-Owned Wells									
Burn Site Well	6374.66	1-Oct-2024	134.68	6239.98	6240	Bedrock (schist and granite)		SNL/NM	DOE/NNSA
CCBA-MW1	5902.34	1-Oct-2024	48.24	5854.10	5854	Alluvium and bedrock (granite)		SNL/NM	DOE/NNSA
CCBA-MW2	5939.28	1-Oct-2024	73.00	5866.28	5866	Bedrock (granite)		SNL/NM	DOE/NNSA
CTF-MW1	6082.63	1-Oct-2024	242.49	5840.14	5840	Bedrock (granite)		SNL/NM	DOE/NNSA
CTF-MW2	5578.60	1-Oct-2024	44.29	5534.31	5534	Bedrock (granite)		SNL/NM	DOE/NNSA
CTF-MW3	5522.82	1-Oct-2024	312.24	5210.58	5211	Bedrock (granite)		SNL/NM	DOE/NNSA
CWL-BW5	5434.79	1-Oct-2024	516.80	4917.99	4918	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
CWL-MW9	5426.12	1-Oct-2024	507.57	4918.55	4919	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
CWL-MW10	5424.58	1-Oct-2024	504.63	4919.95	4920	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
CWL-MW11	5423.24	1-Oct-2024	502.65	4920.59	4921	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
CYN-MW3	6313.26	1-Oct-2024	dry	dry	dry	Bedrock (metamorphics)		SNL/NM	DOE/NNSA
CYN-MW4	6455.48	1-Oct-2024	246.43	6209.05	6209	Bedrock (quartzite)		SNL/NM	DOE/NNSA
CYN-MW5	5984.23	1-Oct-2024	109.77	5874.46	5874	Bedrock (quartzite)		SNL/NM	DOE/NNSA
CYN-MW6	6343.37	1-Oct-2024	161.92	6181.45	6181	Bedrock (metamorphics)		SNL/NM	DOE/NNSA
CYN-MW7	6216.35	1-Oct-2024	309.95	5906.40	5906	Bedrock (granitic gneiss)		SNL/NM	DOE/NNSA
CYN-MW8	6230.11	1-Oct-2024	325.76	5904.35	5904	Bedrock (granitic gneiss)		SNL/NM	DOE/NNSA
CYN-MW9	6360.67	1-Oct-2024	193.48	6167.19	6167	Bedrock (metamorphics)		SNL/NM	DOE/NNSA
CYN-MW10	6345.45	1-Oct-2024	151.86	6193.59	6194	Bedrock (metamorphics)		SNL/NM	DOE/NNSA
CYN-MW11	6374.41	1-Oct-2024	134.34	6240.07	6240	Bedrock (metamorphics)		SNL/NM	DOE/NNSA
CYN-MW12	6345.16	1-Oct-2024	237.91	6107.25	6107	Bedrock (metamorphics)		SNL/NM	DOE/NNSA
CYN-MW13	6237.79	1-Oct-2024	331.92	5905.87	5906	Bedrock (granitic gneiss)		SNL/NM	DOE/NNSA
CYN-MW14A	6315.85	1-Oct-2024	206.68	6109.17	6109	Bedrock (metamorphics)	NC - deeper fracture	SNL/NM	DOE/NNSA
CYN-MW15	6344.44	1-Oct-2024	181.34	6163.10	6163	Bedrock (metamorphics)		SNL/NM	DOE/NNSA
CYN-MW16	6249.60	1-Oct-2024	343.84	5905.76	5906	Bedrock (granitic gneiss)		SNL/NM	DOE/NNSA
CYN-MW17	6268.95	1-Oct-2024	363.12	5905.83	5906	Bedrock (granitic gneiss)		SNL/NM	DOE/NNSA
CYN-MW18	6304.02	1-Oct-2024	257.23	6046.79	6047	Bedrock (metamorphics)		SNL/NM	DOE/NNSA
CYN-MW19	6410.43	1-Oct-2024	46.90	6363.53	6364	Bedrock (metamorphics)		SNL/NM	DOE/NNSA
Greystone-MW2	5814.20	1-Oct-2024	55.64	5758.56	5759	Alluvium in arroyo, recent	NC - alluvium	SNL/NM	DOE/NNSA
LWDS-MW1	5423.83	2-Oct-2024	507.75	4916.08	4916	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
MRN-2	5308.18	1-Oct-2024	428.97	4879.21	4879	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
MRN-3D	5309.34	1-Oct-2024	429.49	4879.85	4880	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
MWL-BW2	5391.02	1-Oct-2024	483.14	4907.88	4908	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
MWL-MW4	5391.70	1-Oct-2024	502.23	4889.47	4889	Regional Aquifer – SFG sediments	corrected for slant	SNL/NM	DOE/NNSA
MWL-MW5	5382.56	1-Oct-2024	493.54	4889.02	4889	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
MWL-MW6	5375.31	1-Oct-2024	486.97	4888.34	4888	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
MWL-MW7	5383.30	1-Oct-2024	490.91	4892.39	4892	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
MWL-MW8	5384.67	1-Oct-2024	492.53	4892.14	4892	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
MWL-MW9	5381.91	1-Oct-2024	491.90	4890.01	4890	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
NWTA3-MW2	5337.49	1-Oct-2024	458.67	4878.82	4879	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
NWTA3-MW3D	5340.80	1-Oct-2024	457.75	4883.05	4883	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
OBS-MW1	5871.42	1-Oct-2024	72.54	5798.88	5799	Bedrock (granite)		SNL/NM	DOE/NNSA
OBS-MW2	5863.16	1-Oct-2024	171.44	5691.72	5692	Bedrock (granite)		SNL/NM	DOE/NNSA
OBS-MW3	5865.50	1-Oct-2024	70.33	5795.17	5795	Bedrock (granite)		SNL/NM	DOE/NNSA

Table 2 (continued)
Site-Wide Groundwater Elevations for Active Monitoring Wells Located at Sandia National Laboratories, New Mexico and the Kirtland Air Force Base Vicinity for Calendar Year 2024

Well ID	Measuring Point [a, b, c] (ft amsl, NAVD 88)	Date Measured (2024) [d]	Depth to Water (ft btoc, 2024)	Groundwater Elevation (ft amsl, 2024)	Groundwater Elevation, rounded (ft amsl, 2024)	Screened Unit	Comment, as needed	Data Source	Well Owner
PGS-2	5406.93	2-Oct-2024	533.08	4873.85	4874	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
PL-2	5336.01	1-Oct-2024	457.93	4878.08	4878	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
PL-4	5334.98	1-Oct-2024	456.84	4878.14	4878	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
SFR-1D	5399.13	1-Oct-2024	140.65	5258.48	5258	Regional Aquifer – SFG sediments	NC - deeper fracture	SNL/NM	DOE/NNSA
SFR-1S	5399.16	1-Oct-2024	90.82	5308.34	5308	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
SFR-2S	5432.77	1-Oct-2024	102.30	5330.47	5330	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
SFR-3D	5497.94	1-Oct-2024	163.74	5334.20	5334	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
SFR-3P	5499.63	1-Oct-2024	164.07	5335.56	5336	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
SFR-3S	5498.24	1-Oct-2024	163.00	5335.24	5335	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
SFR-3T	5498.66	1-Oct-2024	68.14	5430.52	5431	Bedrock (sandstone)	NC – deeper fracture	SNL/NM	DOE/NNSA
SFR-4P	5573.33	1-Oct-2024	152.88	5420.45	5420	Bedrock (sandstone)		SNL/NM	DOE/NNSA
SFR-4T	5573.95	1-Oct-2024	153.32	5420.63	5421	Bedrock (sandstone)		SNL/NM	DOE/NNSA
SWTA3-MW2	5325.60	1-Oct-2024	445.24	4880.36	4880	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
SWTA3-MW3	5323.94	1-Oct-2024	443.22	4880.72	4881	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
SWTA3-MW4	5324.81	1-Oct-2024	443.99	4880.82	4881	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
TA1-W-01	5403.82	2-Oct-2024	527.69	4876.13	4876	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
TA1-W-02	5416.62	2-Oct-2024	516.88	4899.74	4900	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
TA1-W-03	5457.03	2-Oct-2024	dry	dry	dry	PGWS - SFG sediments		SNL/NM	DOE/NNSA
TA1-W-04	5460.98	2-Oct-2024	563.54	4897.44	4897	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
TA1-W-05	5433.84	4-Oct-2024	559.36	4874.48	4874	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
TA1-W-06	5417.10	2-Oct-2024	311.09	5106.01	5106	PGWS - SFG sediments	value not plotted	SNL/NM	DOE/NNSA
TA1-W-07	5404.92	2-Oct-2024	287.58	5117.34	5117	PGWS - SFG sediments	value not plotted	SNL/NM	DOE/NNSA
TA1-W-08	5434.19	4-Oct-2024	312.82	5121.37	5121	PGWS - SFG sediments	value not plotted	SNL/NM	DOE/NNSA
TA2-NW1-325	5421.94	2-Oct-2024	322.44	5099.50	5100	PGWS - SFG sediments	value not plotted	SNL/NM	DOE/NNSA
TA2-NW1-595	5421.26	2-Oct-2024	515.95	4905.31	4905	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
TA2-W-01	5419.99	2-Oct-2024	332.93	5087.06	5087	PGWS - SFG sediments	value not plotted	SNL/NM	DOE/NNSA
TA2-W-19	5351.21	2-Oct-2024	276.32	5074.89	5075	PGWS - SFG sediments	value not plotted	SNL/NM	DOE/NNSA
TA2-W-24	5363.66	2-Oct-2024	438.35	4925.31	4925	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
TA2-W-25	5374.86	2-Oct-2024	461.95	4912.91	4913	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
TA2-W-26	5375.77	2-Oct-2024	291.44	5084.33	5084	PGWS - SFG sediments	value not plotted	SNL/NM	DOE/NNSA
TA2-W-27	5362.85	2-Oct-2024	284.51	5078.34	5078	PGWS - SFG sediments	value not plotted	SNL/NM	DOE/NNSA
TA2-W-28	5412.41	2-Oct-2024	323.38	5089.03	5089	PGWS - SFG sediments	value not plotted	SNL/NM	DOE/NNSA
TAV-MW2	5427.33	2-Oct-2024	512.01	4915.32	4915	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
TAV-MW3	5464.30	2-Oct-2024	550.24	4914.06	4914	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
TAV-MW4	5427.89	2-Oct-2024	512.14	4915.75	4916	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
TAV-MW5	5408.71	3-Oct-2024	496.97	4911.74	4912	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
TAV-MW6	5431.17	2-Oct-2024	515.48	4915.69	4916	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
TAV-MW7	5430.40	2-Oct-2024	517.50	4912.90	4913	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
TAV-MW8	5417.00	2-Oct-2024	500.73	4916.27	4916	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
TAV-MW9	5416.27	2-Oct-2024	503.49	4912.78	4913	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
TAV-MW10	5437.03	2-Oct-2024	521.81	4915.22	4915	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
TAV-MW11	5440.12	2-Oct-2024	524.46	4915.66	4916	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
TAV-MW12	5435.72	2-Oct-2024	521.23	4914.49	4914	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
TAV-MW13	5409.02	3-Oct-2024	499.43	4909.59	4910	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA

Table 2 (continued)
Site-Wide Groundwater Elevations for Active Monitoring Wells Located at Sandia National Laboratories, New Mexico and the Kirtland Air Force Base Vicinity for Calendar Year 2024

Well ID	Measuring Point [a, b, c] (ft amsl, NAVD 88)	Date Measured (2024) [d]	Depth to Water (ft btoc, 2024)	Groundwater Elevation (ft amsl, 2024)	Groundwater Elevation, rounded (ft amsl, 2024)	Screened Unit	Comment, as needed	Data Source	Well Owner
TAV-MW14	5441.52	2-Oct-2024	528.24	4913.28	4913	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
TAV-MW15	5437.32	2-Oct-2024	522.93	4914.39	4914	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
TAV-MW16	5448.34	2-Oct-2024	534.48	4913.86	4914	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
TAV-MW17	5443.92	2-Oct-2024	529.71	4914.21	4914	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
TJA-2	5353.20	2-Oct-2024	280.84	5072.36	5072	PGWS - SFG sediments	value not plotted	SNL/NM	DOE/NNSA
TJA-3	5390.56	2-Oct-2024	498.56	4892.00	4892	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
TJA-4	5341.16	2-Oct-2024	300.15	5041.01	5041	Merging Zone – SFG sediments	NC - Merging Zone	SNL/NM	DOE/NNSA
TJA-5	5341.33	2-Oct-2024	271.76	5069.57	5070	PGWS - SFG sediments	value not plotted	SNL/NM	DOE/NNSA
TJA-6	5343.16	2-Oct-2024	450.74	4892.42	4892	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
TJA-7	5391.27	2-Oct-2024	305.99	5085.28	5085	PGWS - SFG sediments	value not plotted	SNL/NM	DOE/NNSA
TRE-1	5497.25	1-Oct-2024	179.38	5317.87	5318	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
TRE-2	5497.20	nm	nm	nm	nm	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
TRN-1	5735.62	1-Oct-2024	93.46	5642.16	5642	Bedrock (sandstone)		SNL/NM	DOE/NNSA
TRS-1D	5779.80	1-Oct-2024	128.27	5651.53	5652	Bedrock (limestone)		SNL/NM	DOE/NNSA
TRS-1S	5780.07	1-Oct-2024	136.16	5643.91	5644	Bedrock (limestone)		SNL/NM	DOE/NNSA
TRS-2	5780.76	1-Oct-2024	136.49	5644.27	5644	Bedrock (limestone)		SNL/NM	DOE/NNSA
WYO-3	5392.09	2-Oct-2024	515.60	4876.49	4876	Regional Aquifer – SFG sediments		SNL/NM	DOE/NNSA
WYO-4	5392.57	2-Oct-2024	dry	dry	dry	PGWS - SFG sediments	value not plotted	SNL/NM	DOE/NNSA
Wells Owned by Other Agencies									
Eubank-1	5460.02	2-Oct-2024	542.70	4917.32	4917	Regional Aquifer – SFG sediments		SNL/NM	COA EHD
Eubank-2	5474.39	16-Dec-2024	570.69	4903.70	4904	Regional Aquifer – SFG sediments		COA EHD	COA EHD
Eubank-3	5498.73	16-Dec-2024	599.68	4899.05	4899	Regional Aquifer – SFG sediments		COA EHD	COA EHD
Eubank-5	5507.40	16-Dec-2024	608.74	4898.66	4899	Regional Aquifer – SFG sediments		COA EHD	COA EHD
KAFB-0118	5320.70	5-Feb-2024	442.01	4878.69	4879	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0119	5315.81	5-Feb-2024	437.57	4878.24	4878	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0120	5289.49	5-Feb-2024	441.46	4848.03	4848	Regional Aquifer – SFG sediments	field error, not plotted	KAFB	KAFB
KAFB-0121	5307.41	5-Feb-2024	429.12	4878.29	4878	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0213	5282.18	5-Feb-2024	407.88	4874.30	4874	Regional Aquifer – SFG sediments	field error, not plotted	KAFB	KAFB
KAFB-0219	5263.85	5-Feb-2024	386.33	4877.52	4878	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0220	5264.72	5-Feb-2024	387.51	4877.21	4877	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0221	5274.22	5-Feb-2024	396.88	4877.34	4877	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0222	5244.49	5-Feb-2024	367.02	4877.47	4877	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0223	5251.38	5-Feb-2024	374.03	4877.35	4877	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0307	5363.85	6-Feb-2024	409.56	4954.29	4954	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0308	5381.08	5-Feb-2024	442.08	4939.00	4939	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0309	5411.29	6-Feb-2024	471.64	4939.65	4940	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0310	5416.06	6-Feb-2024	355.86	5060.20	5060	PGWS - SFG sediments	value not plotted	KAFB	KAFB
KAFB-0311	5352.74	6-Feb-2024	416.02	4936.72	4937	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0312	5431.93	6-Feb-2024	416.68	5015.25	5015	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0313	5418.58	6-Feb-2024	351.19	5067.39	5067	PGWS - SFG sediments	value not plotted	KAFB	KAFB
KAFB-0314	5455.45	6-Feb-2024	418.56	5036.89	5037	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0315	5466.53	6-Feb-2024	438.08	5028.45	5028	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0417	5317.25	20-Feb-2024	437.77	4879.48	4879	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0504	5357.87	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB

Table 2 (continued)
Site-Wide Groundwater Elevations for Active Monitoring Wells Located at Sandia National Laboratories, New Mexico and the Kirtland Air Force Base Vicinity for Calendar Year 2024

Well ID	Measuring Point [a, b, c] (ft amsl, NAVD 88)	Date Measured (2024) [d]	Depth to Water (ft btoc, 2024)	Groundwater Elevation (ft amsl, 2024)	Groundwater Elevation, rounded (ft amsl, 2024)	Screened Unit	Comment, as needed	Data Source	Well Owner
KAFB-0505	5363.65	29-Mar-2024	485.72	4877.93	4878	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0506	5363.62	30-Sep-2024	212.89	5150.73	5151	PGWS - SFG sediments	value not plotted	KAFB	KAFB
KAFB-0507R	5358.56	8-May-2024	481.11	4877.45	4877	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0508	5353.62	20-Feb-2024	476.06	4877.56	4878	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0509	5441.56	nm	nm	nm	nm	above PGWS – SFG sediments		KAFB	KAFB
KAFB-0510	5372.30	26-Feb-2024	492.16	4880.14	4880	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0512R	5302.73	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0514	5206.41	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0516	5205.64	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0517	5197.11	5-Mar-2024	318.68	4878.43	4878	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0518	5177.88	20-Feb-2024	298.97	4878.91	4879	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0519	5365.37	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0520	5250.09	8-May-2024	371.38	4878.71	4879	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0521	5359.80	nm	nm	nm	nm	Regional Aquifer – SFG sediments	FLUTe well	KAFB	KAFB
KAFB-0522	5270.06	29-Mar-2024	391.96	4878.10	4878	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0523	5352.62	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0524	5345.83	20-Feb-2024	467.98	4877.85	4878	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0525	5229.75	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0602	5364.07	29-Mar-2024	nm	nm	nm	PGWS - SFG sediments	value not plotted	KAFB	KAFB
KAFB-0608	5359.80	29-Mar-2024	292.44	5067.36	5067	PGWS - SFG sediments	value not plotted	KAFB	KAFB
KAFB-0610	5359.22	29-Mar-2024	nm	nm	nm	PGWS - SFG sediments	value not plotted	KAFB	KAFB
KAFB-0611	5386.08	19-Feb-2024	463.30	4922.78	4923	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0612	5385.45	nm	nm	nm	nm	PGWS - SFG sediments	value not plotted	KAFB	KAFB
KAFB-0613	5390.78	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0614	5391.22	22-Feb-2024	331.13	5060.09	5060	PGWS - SFG sediments	value not plotted	KAFB	KAFB
KAFB-0615	5638.43	nm	nm	nm	nm	Bedrock (granite)		KAFB	KAFB
KAFB-0616	5481.04	19-Feb-2024	445.05	5035.99	5036	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0617	5506.07	19-Feb-2024	554.96	4951.11	4951	Regional Aquifer – SFG sediments	NC - nearby fault	KAFB	KAFB
KAFB-0618	5411.63	19-Feb-2024	484.41	4927.22	4927	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0619	5412.37	19-Feb-2024	384.31	5028.06	5028	PGWS - SFG sediments	value not plotted	KAFB	KAFB
KAFB-0620	5334.34	19-Feb-2024	442.24	4892.10	4892	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0621	5568.89	20-Feb-2024	622.64	4946.25	4946	Regional Aquifer – SFG sediments	nearby fault	KAFB	KAFB
KAFB-0622	5488.64	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0623	5328.94	nm	nm	nm	nm	PGWS - SFG sediments	value not plotted	KAFB	KAFB
KAFB-0624	5674.15	19-Feb-2024	767.59	4906.56	4907	Regional Aquifer – SFG sediments	NC - nearby fault	KAFB	KAFB
KAFB-0625	5390.23	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0626	FLUTe	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0901	5390.07	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-0903	5391.63	nm	nm	nm	nm	above PGWS – SFG sediments	semiconfined?	KAFB	KAFB
KAFB-0904	5291.75	27-Feb-2024	351.35	4940.40	4940	Regional Aquifer – SFG sediments	NC - semiconfined?	KAFB	KAFB
KAFB-1001	5260.43	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-1002	5254.75	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-1003	5258.29	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-1004	5258.81	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB

Table 2 (continued)
Site-Wide Groundwater Elevations for Active Monitoring Wells Located at Sandia National Laboratories, New Mexico and the Kirtland Air Force Base Vicinity for Calendar Year 2024

Well ID	Measuring Point [a, b, c] (ft amsl, NAVD 88)	Date Measured (2024) [d]	Depth to Water (ft btoc, 2024)	Groundwater Elevation (ft amsl, 2024)	Groundwater Elevation, rounded (ft amsl, 2024)	Screened Unit	Comment, as needed	Data Source	Well Owner
KAFB-1005	5274.68	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-1006	5257.01	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-1007R	5260.80	6-Mar-2024	380.47	4880.33	4880	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-1008	5260.77	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-1009	5272.16	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-1021	5348.02	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-1901	5751.58	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-1902	5754.27	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-1904	5752.29	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-2005	5624.27	nm	nm	nm	nm	Bedrock (granite)		KAFB	KAFB
KAFB-2006	5590.88	nm	nm	nm	nm	Bedrock (granite)		KAFB	KAFB
KAFB-2007	5564.48	nm	nm	nm	nm	Bedrock (granite)		KAFB	KAFB
KAFB-2008	5541.62	20-Feb-2024	602.01	4939.61	4940	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-2009	5655.63	nm	nm	nm	nm	Bedrock (granite)		KAFB	KAFB
KAFB-2622	5360.17	29-Mar-2024	dry	dry	dry	PGWS - SFG sediments	value not plotted	KAFB	KAFB
KAFB-2623	5369.28	30-Sep-2024	222.44	5146.84	5147	PGWS - SFG sediments	value not plotted	KAFB	KAFB
KAFB-2624	5364.21	29-Mar-2024	dry	dry	dry	PGWS - SFG sediments	value not plotted	KAFB	KAFB
KAFB-2625	5356.62	29-Mar-2024	200.23	5156.39	5156	PGWS - SFG sediments	value not plotted	KAFB	KAFB
KAFB-2626	5357.55	29-Mar-2024	dry	dry	dry	PGWS - SFG sediments	value not plotted	KAFB	KAFB
KAFB-2627	5367.51	30-Sep-2024	219.45	5148.06	5148	PGWS - SFG sediments	value not plotted	KAFB	KAFB
KAFB-2628	5369.44	29-Mar-2024	491.69	4877.75	4878	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-2629	5361.66	29-Mar-2024	484.17	4877.49	4877	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-2630	5361.78	29-Mar-2024	213.61	5148.17	5148	above PGWS – SFG sediments	value not plotted	KAFB	KAFB
KAFB-2631	5336.14	29-Mar-2024	dry	dry	dry	above PGWS – SFG sediments	value not plotted	KAFB	KAFB
KAFB-2632	5329.58	29-Mar-2024	173.43	5156.15	5156	above PGWS – SFG sediments	value not plotted	KAFB	KAFB
KAFB-2901	5839.08	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-2902	5832.10	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-2903	5819.46	nm	nm	nm	nm	Bedrock (Abo Formation) siltstone/shale		KAFB	KAFB
KAFB-2904	5842.72	nm	nm	nm	nm	Bedrock (Madera Formation) limestone		KAFB	KAFB
KAFB-3391	5396.19	30-Sep-2024	277.80	5118.39	5118	PGWS - SFG sediments	value not plotted	KAFB	KAFB
KAFB-3392	5394.51	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-3411	5342.81	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-6241	5466.50	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-6243	5423.48	19-Feb-2024	503.78	4919.70	4920	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-6301	5459.64	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-7001	5322.94	13-Jun-2024	440.61	4882.33	4882	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-8281	5401.03	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-8282	5402.92	nm	nm	nm	nm	PGWS - SFG sediments	value not plotted	KAFB	KAFB
KAFB-8351	5325.62	13-Jun-2024	442.91	4882.71	4883	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-ST105-EX01	5354.54	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
KAFB-WYO-5	5393.36	30-Sep-2024	301.95	5091.41	5091	PGWS - SFG sediments	value not plotted	KAFB	KAFB
KAFB-WYO-6	5393.79	30-Sep-2024	284.50	5109.29	5109	PGWS - SFG sediments	value not plotted	KAFB	KAFB
KAFB-WYO-7	5391.73	30-Sep-2024	305.61	5086.12	5086	PGWS - SFG sediments	value not plotted	KAFB	KAFB
Mesa del Sol-S	5302.67	4-Oct-2024	419.92	4882.75	4883	Regional Aquifer – SFG sediments		USGS	NMOSE

Table 2 (continued)
Site-Wide Groundwater Elevations for Active Monitoring Wells Located at Sandia National Laboratories, New Mexico and the Kirtland Air Force Base Vicinity for Calendar Year 2024

Well ID	Measuring Point [a, b, c] (ft amsl, NAVD 88)	Date Measured (2024) [d]	Depth to Water (ft btoc, 2024)	Groundwater Elevation (ft amsl, 2024)	Groundwater Elevation, rounded (ft amsl, 2024)	Screened Unit	Comment, as needed	Data Source	Well Owner
Montessa Park-S	5102.67	2-Oct-2024	210.65	4892.02	4892	Regional Aquifer – SFG sediments		USGS	ABCWUA
Site 58 MW-1	5721.57	24-Jun-2024	65.97	5655.60	5656	Colluvium and Bedrock (granite)	value not plotted	KAFB	KAFB
Site 58 MW-2	5715.86	24-Jun-2024	62.72	5653.14	5653	Bedrock (granite)	value not plotted	KAFB	KAFB
Site 58 MW-3	5718.08	24-Jun-2024	64.41	5653.67	5654	Colluvium?	value not plotted	KAFB	KAFB
Site 58 MW-4	5722.27	24-Jun-2024	66.54	5655.73	5656	Bedrock (granite)	value not plotted	KAFB	KAFB
Site 58 MW-5	5716.99	24-Jun-2024	63.36	5653.63	5654	Colluvium?	value not plotted	KAFB	KAFB
Site 58 MW-6	5719.62	24-Jun-2024	66.28	5653.34	5653	Colluvium and Bedrock (granite)?	value not plotted	KAFB	KAFB
Site 58 MW-7	5717.70	24-Jun-2024	65.38	5652.32	5652	Colluvium and Bedrock (granite)?	value not plotted	KAFB	KAFB
ST105-MW001	5279.34	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
ST105-MW002	5180.32	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
ST105-MW003	5174.61	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
ST105-MW004	5234.86	4-Mar-2024	358.21	4876.65	4877	Regional Aquifer – SFG sediments		KAFB	KAFB
ST105-MW005	5287.57	nm	nm	nm	nm	Regional Aquifer – SFG sediments	semiconfined?	KAFB	KAFB
ST105-MW006	5313.19	19-Feb-2024	236.24	5076.95	5077	PGWS - SFG sediments	value not plotted	KAFB	KAFB
ST105-MW007	5311.18	nm	nm	nm	nm	Regional Aquifer – SFG sediments	semiconfined?	KAFB	KAFB
ST105-MW008	5359.14	20-Feb-2024	477.88	4881.26	4881	Regional Aquifer – SFG sediments		KAFB	KAFB
ST105-MW009	5519.08	19-Feb-2024	486.68	5032.40	5032	Regional Aquifer – SFG sediments		KAFB	KAFB
ST105-MW010	5334.70	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
ST105-MW011	5422.23	19-Feb-2024	483.75	4938.48	4938	Regional Aquifer – SFG sediments		KAFB	KAFB
ST105-MW012	5419.90	nm	nm	nm	nm	PGWS - SFG sediments		KAFB	KAFB
ST105-MW013	5446.71	19-Feb-2024	436.42	5010.29	5010	Regional Aquifer – SFG sediments		KAFB	KAFB
ST105-MW015	5623.29	6-Mar-2024	685.13	4938.16	4938	Regional Aquifer – SFG sediments	NC - nearby fault	KAFB	KAFB
ST105-MW017	5617.90	19-Feb-2024	703.98	4913.92	4914	Regional Aquifer – SFG sediments	NC - nearby fault	KAFB	KAFB
ST105-MW018	5222.12	20-Feb-2024	344.41	4877.71	4878	Regional Aquifer – SFG sediments		KAFB	KAFB
ST105-MW019	5217.94	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
ST105-MW020	5383.35	19-Feb-2024	300.98	5082.37	5082	PGWS - SFG sediments	value not plotted	KAFB	KAFB
ST105-MW021	5390.75	23-Feb-2024	330.99	5059.76	5060	PGWS - SFG sediments	value not plotted	KAFB	KAFB
ST105-MW022	5386.64	5-Mar-2024	470.78	4915.86	4916	Regional Aquifer – SFG sediments		KAFB	KAFB
ST105-MW023	5275.86	nm	nm	nm	nm	Regional Aquifer – SFG sediments		KAFB	KAFB
ST105-MW024	5595.67	nm	nm	nm	nm	Bedrock (granite)		KAFB	KAFB
YALE-MW1	5308.45	5-Dec-2024	414.01	4894.44	4894	Regional Aquifer – SFG sediments		COA EHD	COA EHD
YALE-MW9	5271.06	5-Dec-2024	369.44	4901.62	4902	Regional Aquifer – SFG sediments		COA EHD	COA EHD
4-HILLS-1	5554.17	nm	nm	nm	nm	Alluvial sands and gravels		COA EHD	COA EHD

Table 2 (concluded)
Site-Wide Groundwater Elevations for Active Monitoring Wells Located at Sandia National Laboratories, New Mexico and the Kirtland Air Force Base Vicinity for Calendar Year 2024

Notes:

[a] Measuring point is the elevation for the top of casing, typically the top of PVC casing, that is used for measuring and calculating groundwater elevations.

[b] Elevations are relative to the NAVD 88, New Mexico State Plane Coordinate System, Central Zone. Elevation data from other government agencies that were based on the National Geodetic Vertical Datum 1929 were converted (re-projected) by +2.671 ft.

[c] Well construction details are listed in Table 1.

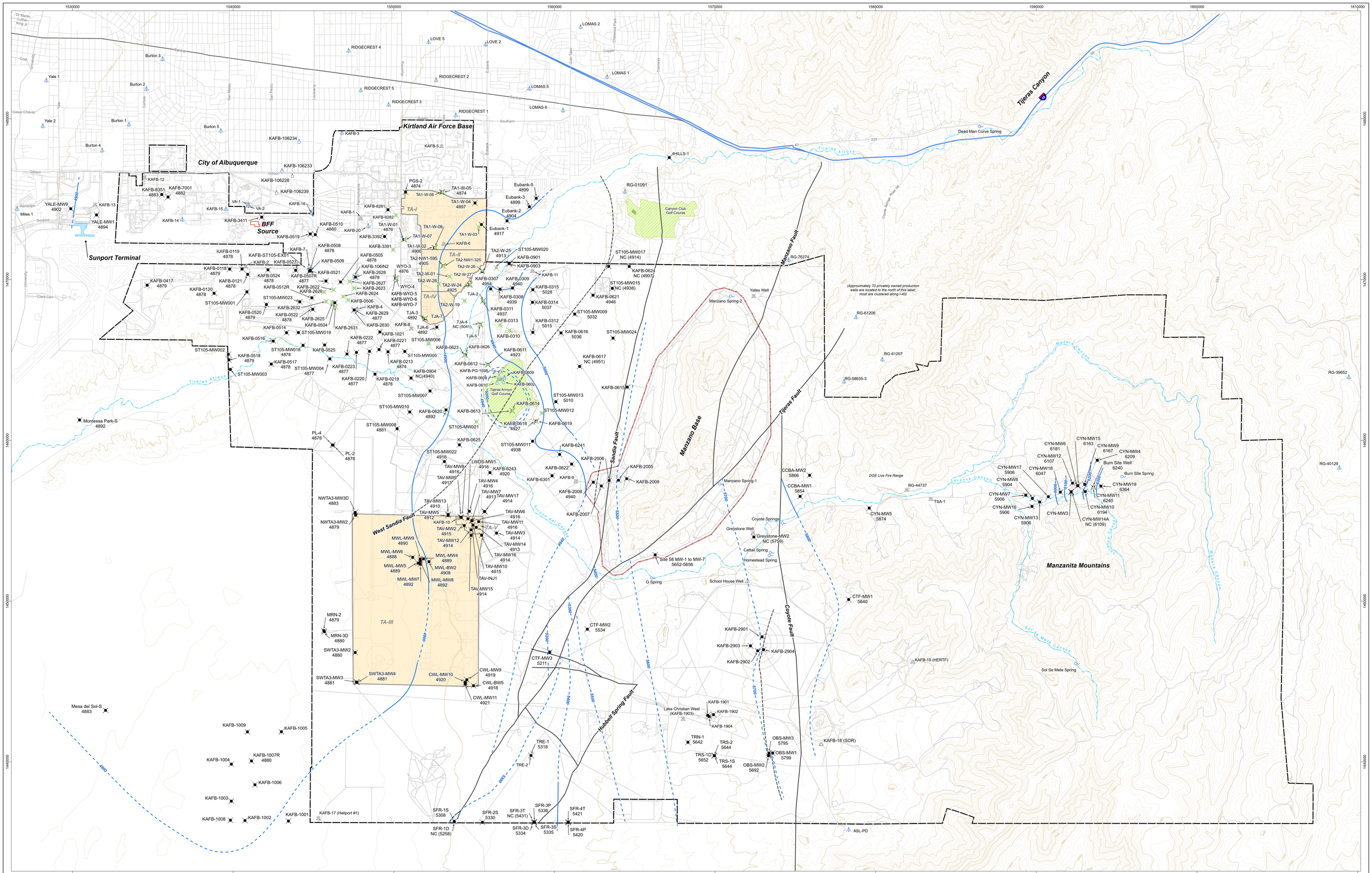
[d] Wells KAFB-0602, KAFB-0608, and KAFB-0610 are small diameter extraction wells at the Tijeras Arroyo Golf Course. Pumps were present in wells KAFB-0602 and KAFB-0610.

Green shading denotes monitoring wells screened in the Perched Groundwater System. Blue shading denotes that the well is screened in the Merging Zone. No shading denotes wells screened in the Regional Aquifer.

The comment "value not plotted" refers to Plate 1. Groundwater elevations for PGWS wells are not plotted.

ABCWUA	= Albuquerque Bernalillo County Water Utility Authority
amsl	= above mean sea level
btoc	= below top of casing (below the measuring point)
BW	= Background Well
CCBA	= Coyote Canyon Blast Area
COA EHD	= City of Albuquerque Environmental Health Department
corrected	= MWL-MW4 depth to groundwater was corrected for the inclined well casing (6 degrees).
CTF	= Coyote Test Field
CWL	= Chemical Waste Landfill
CYN	= Canyons (in Lurance Canyon area)
D	= deeper well completion
DOE/NNSA	= U.S. Department of Energy/National Nuclear Security Administration
dry	= Water was not present in the well screen.
EX	= Well proposed for extraction purposes but used for monitoring purposes only.
FLUTe	= Flexible Liner Underground Technologies, LLC. There is no access for water level.
ft	= foot (feet)
ID	= identifier
KAFB	= Kirtland Air Force Base
LWDS	= Liquid Waste Disposal System
MRN	= Magazine Road North
MW	= Monitoring Well
MWL	= Mixed Waste Landfill
NAVD 88	= North American Vertical Datum of 1988
NC	= Not contoured (see explanations below)
NC – alluvium	= Well is screened in alluvium along the arroyo channel.
NC – deeper fracture	= Well is screened in a deeper bedrock fracture.
NC – Merging Zone	= Well is screened in the Merging Zone that hydraulically connects the PGWS and the Regional Aquifer.
NC – nearby fault	= A buried (unmapped) fault appears to have a localized effect on groundwater.
Nm	= not measured
NMOSE	= New Mexico Office of the State Engineer
NWTA3	= Northwest Technical Area-III
OBS	= Old Burn Site (in Coyote Test Field)
PGS	= Parade Ground South
PGWS	= Perched Groundwater System
PL	= Power Line Road (northwest of Technical Area-III)
PVC	= polyvinyl chloride
R	= Replacement well (term used by KAFB)
S	= Shallow (shallower bedrock well completion) at SFR and TRS wells.
SFG	= Santa Fe Group
SFR	= South Fence Road
ST105	= Series of KAFB/USAF monitoring wells for nitrate abatement study.
SWTA3	= Southwest Technical Area-III
TA1-W	= Technical Area-I well
TA2-NW	= Technical Area-II Northwest well
TA2-W	= Technical Area-II well
TAV	= Technical Area-V (monitoring well designation)
TJA	= Tijeras Arroyo (monitoring well designation)
TRE	= Thunder Road East
TRN	= Target Road North
TRS	= Target Road South
USAF	= U.S. Air Force
W	= Well
WYO	= Wyoming Boulevard well
YALE	= Yale Landfill well
?	= Accuracy of information or interpretation is questionable.

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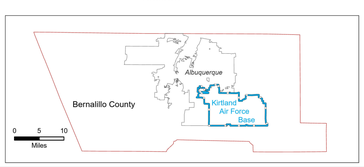
0 2,000 4,000 Feet

0 750 1,500 Meters

0 0.5 1 Miles

0 0.75 1.5 Kilometers

N



Legend

- Monitoring Well, Regional Aquifer / Fractured Bedrock System
- Monitoring Well, Perched Groundwater System
- Production Well, potable
- Production Well, non-potable
- Production Well, plugged and abandoned
- Extraction Well
- Extraction Well, plugged and abandoned
- Injection Well
- Spring, current or historical flow
- NC Not Contoured

- Potentiometric surface contour (feet above mean sea level [feet amsl])
- dashed where uncertain
- Fault, exposed and concealed
- Fault, fully concealed
- Surface drainage, arroyo
- Ground surface contour (40 ft interval)
- Road, paved and unpaved
- Bulk Fuels Facility (BFF) KAFB
- Golf Course
- Golf Course Main Pond
- SNL/NM Technical Area (TA) boundary
- Manzano Base boundary
- Kirtland Air Force Base (KAFB) boundary

NOTES:

1. Groundwater elevations for the Regional Aquifer and the Fractured Bedrock System are shown for monitoring wells located near Sandia National Laboratories, New Mexico (SNL/NM) facilities. The wells with no available recent groundwater elevation have no value plotted.
2. Monitoring wells with anomalous groundwater elevations in the Regional Aquifer or Fractured Bedrock System are shown with an NC (not contoured) label next to the value. Table 2 states the rationale.
3. Groundwater elevations are rounded to the nearest foot. Water levels were measured at Department of Energy/National Nuclear Security Administration owned monitoring wells between 1 October and 4 October, 2024. Groundwater elevations and measurement dates are listed in Table 2. Monitoring wells and wells owned by other government entities were measured during February to December 2024.
4. Groundwater elevations from production, injection, and extraction wells are not used.
5. Groundwater elevations for monitoring wells screened in the Perched Groundwater System are not plotted. A potentiometric surface figure for the Perched Groundwater System is presented in Chapter 6.
6. Potentiometric surface contours for the Regional Aquifer are primarily shown using two intervals: below 5000 ft amsl the contour intervals are 40 and 60 feet; above 5000 ft amsl the contour interval is 100 feet.
7. Most of the monitoring wells located near the KAFB Bulk Fuels Facility and at KAFB Site 58 are not plotted.
8. Decommissioned (plugged and abandoned) monitoring wells are not shown.
9. Faults are derived from multiple sources. The major faults (Coyote, Hubbell Spring, Manzano, Sandia, and Tijeras) were identified from GRAM and Lettis (December 1995). The West Sandia Fault is described in Van Hart (June 2003). Numerous faults located in the mountainous terrain east of the Coyote Fault and the Tijeras Fault are not shown. The dashed faults located near wells KAFB-2007 and OBS-MW1 are inferred from historical groundwater elevations.
10. West of the Sandia Fault, the Regional Aquifer is present within the unconsolidated Santa Fe Group sediments. Groundwater within and east of the Tijeras Fault Zone (bounded by the Sandia and Tijeras Faults) is primarily present in the Paleozoic and Precambrian bedrock.
11. The West Sandia Fault does not affect the alluvial-fan sediments at the water table.

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Plate 1
Potentiometric Surface for the Regional Aquifer and the Fractured Bedrock System at Sandia National Laboratories, New Mexico and Kirtland Air Force Base for Calendar Year 2024

Transverse Mercator Projection
New Mexico State Plane Coordinate System, Central Zone
1983 North American Horizontal Datum
1988 North American Vertical Datum

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Sandia National Laboratories

Data Packages
(Provided Separately)

1 Long-Term Stewardship Groundwater Monitoring Program Data Packages, Calendar Year 2024

2 Chemical Waste Landfill Data Packages, Calendar Year 2024

3 Mixed Waste Landfill Data Packages, Calendar Year 2024

4 Technical Area-V Groundwater Area of Concern Data Packages, Calendar Year 2024

5 Tijeras Arroyo Groundwater Area of Concern Data Packages, Calendar Year 2024

6 Burn Site Groundwater Area of Concern Data Packages, Calendar Year 2024

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