

**United States Department of Energy
Carlsbad Field Office**

**Waste Isolation Pilot Plant
Annual Site Environmental Report for 2025**

**DOE/WIPP-26-3591
Revision 0**



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Reader Survey – Annual Site Environmental Report for 2025

To our readers:

This report presents summary environmental data to (1) characterize environmental management performance at the Waste Isolation Pilot Plant (WIPP) site; (2) summarize environmental occurrences and responses reported during the calendar year; (3) summarize compliance with environmental standards and requirements; and (4) highlight the WIPP Environmental Management System (EMS), significant environmental programs and accomplishments, including progress toward U.S. Department of Energy (DOE) Environmental Sustainability Goals.

It is important that the information we provide is valid, accurate, easily understood, of interest, and communicates the DOE's efforts and commitment to environmental protection, compliance, and sustainability. We would like to know from you whether we are successful in achieving these goals. Your comments are appreciated and will help us to improve our communications.

Is the writing: ☐ Too concise ☐ Too wordy ☐ Uneven ☐ Just right

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Is the text easy to understand ☐ Yes ☐ No
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Do the illustrations help you understand the text better?	☐	☐
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Are the methodologies described reasonably understandable?	☐	☐
Are the appendices useful?	☐	☐

How do you use the WIPP Annual Site Environmental Report (ASER) (check all that apply)?

To obtain general information about DOE activities at WIPP ☐ ☐

To obtain compliance information ☐ ☐

Other (please specify): _____

Comments: _____

Please return this survey to: Director of Environmental Regulatory Compliance Division,
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Name _____ Occupation _____

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REVISION SUMMARY

Revision Number	Description of Changes
0	Initial issue. This report was prepared to meet the annual reporting requirement prescribed in (DOE) Orders 231.1B and 458.1.

EXECUTIVE SUMMARY

REPORT PURPOSE AND DEVELOPMENT

The 2025 Waste Isolation Pilot Plant (WIPP) Annual Site Environmental Report (ASER) demonstrates compliance with U.S. Department of Energy (DOE) requirements by presenting environmental monitoring data that inform the public and assess whether the site operations affected public health, worker safety, or the environment. For 2025, the WIPP facility was managed and operated by Salado Isolation Mining Contractors, LLC (SIMCO) for the DOE (owner of the WIPP facility) under contract 89303322DEM000077.

WIPP MISSION AND WASTE EMPLACEMENT

The WIPP Project's mission is to provide safe, compliant, and efficient characterization, certification, transportation, and disposal of defensive transuranic (TRU) waste. During 2025, 441 TRU waste shipments added 3,097.72 cubic meters (m³) of TRU mixed waste and 2,163.05 m³ of Land Withdrawal Act (LWA) waste. By the end of 2025, the total emplaced inventory reached 111,970.73m³ for TRU mixed waste and 80,488.64 m³ for LWA TRU waste. With an authorized capacity of 175,564 m³, 95,075.36 m³ of capacity remains for future waste emplacement.

Environmental Compliance

The owner and operator of the WIPP facility must comply with all applicable federal and state laws, DOE orders, active New Mexico Environment Department (NMED) settlement agreements and any unresolved administrative compliance orders. All reports and documents mandated by the WIPP Hazardous Waste Facility Permit (Permit), *WIPP Discharge Permit* (DP-831), U.S. Environmental Protection Agency (EPA), and Carlsbad Field Office (CBFO) were submitted in accordance with applicable schedules. Regulatory agencies conducted multiple inspections of the facility during the year, all of which verified continued compliance with safety and environmental standards.

The WIPP Environmental Management System (EMS) continues to support regulatory compliance, environmental protection, and sustainable practices.

Monitoring and Environmental Impacts

Numerous environmental samples and monitoring data were collected and analyzed to identify and quantify potential impacts of WIPP facility operations on the surrounding environment.

The results of monitoring programs, confirm that the WIPP facility remained in compliance with applicable environmental requirements and that operations did not adversely affect human health or the environment. TRU constituents in environmental samples were detected only in particulates from effluent air samples under the National Emission Standards for Hazardous Air Pollutants (NESHAP) program. These detections were less than 1 percent of regulatory limits.

Summary of Radiological Doses and Releases. Radiological doses to the public from WIPP operations remained well below all federal limits. Local groundwater aquifers are physically isolated from the facility, making drinking water contamination improbable. Environmental monitoring of game animals, soil, surface water, sediment, vegetation, and local aquatic or terrestrial ecosystems confirmed that TRU waste disposal has caused no adverse impacts on the environment or nonhuman biota.

Furthermore, radionuclide concentrations in air emissions met the standards set by 40 CFR Part 191 (Subpart A) and 40 CFR Part 61 (Subpart H) with historical effective dose equivalent (EDE) values remaining well below EPA limits.

Additionally, no items containing residual radioactive material were released, and the facility recorded zero unplanned reportable releases of pollutants, hazardous substances, or radionuclides, both on-site and during waste transportation.

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ACRONYMS, ABBREVIATIONS, AND UNITS OF MEASURE

AAQS	Ambient Air Quality Standards
ACO	Administrative Compliance Order
AMSL	above mean sea level
ANSI	American National Standards Institute
ANSI/HPS	American National Standards Institute Health Physics Society
AQB	Air Quality Bureau
ASER	Annual Site Environmental Report
AST	aboveground storage tank
ATWIR	Annual Transuranic Waste Inventory Report
BCG	biota concentration guides
BLM	U.S. Department of the Interior Bureau of Land Management
Bq	becquerel
Bq/g	becquerel per gram
Bq/L	becquerel per liter
Bq/m ³	becquerel per cubic meter
Bq/sample	becquerel per sample (composite air filter sample)
BRPE	Brine Retention Pond East
BRPW	Brine Retention Pond West
C&D	construction and demolition
CAA	<i>Clean Air Act</i>
CBFO	Carlsbad Field Office (DOE)
CDX	Central Data Exchange
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH	contact-handled
cm	centimeter
CRA	Compliance Recertification Application
CWA	<i>Clean Water Act</i>
CY	calendar year (2025, unless specified otherwise)
DBP	Disinfectant Byproducts
DMP	Detection Monitoring Program
DNFSB	Defense Nuclear Facilities Safety Board
DOE	U.S. Department of Energy
DP	discharge permit
DQO	Data Quality Objective
DRVMP	Disposal Room VOC Monitoring Program
DTRKMF	Double precision particle tracking for MODFLOW 2000 (software)
ECHO	Enforcement and Compliance History Online
EDE	effective dose equivalent
EMS	Environmental Management System

EMSSC	Environmental Management System Steering Committee
EO	executive order
EPA	U.S. Environmental Protection Agency
EPCRA	<i>Emergency Planning and Community Right-to-Know Act</i>
EPEAT	Electronic Product Environmental Assessment Tool
EUA	Exclusive Use Area
FLS	Facultative Lagoon System
FRS	Facility Register Service
ft	feet
ft ² /d	square foot per day
ft ³	cubic foot
ft ³ /min	cubic foot per minute
FWS	U.S. Fish and Wildlife Service
FY	fiscal year (2024: 10/1/2023 to 9/30/2024; 2025: 10/1/2024 to 9/30/2025)
GAO	U.S. Government Accountability Office
GC/MS	gas chromatography/mass spectrometry
GWQB	Ground Water Quality Bureau
HEPA	high-efficiency particulate air (filter)
HWDU	Hazardous Waste Disposal Unit
ICP	inductively coupled plasma
ID	identification (confidence)
IFR	interim final rule
in	inch
IR	Information Repository
ISMS	Integrated Safety Management System
ISO	International Organization for Standardization
J	estimated concentration/value
kgal	1,000 gallons
km	kilometer
km ²	square kilometer
L	liter
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
LEPC	Local Emergency Planning Committee
LLW	low-level waste
LMP	<i>Waste Isolation Pilot Plant Land Management Plan</i>
LTWDP	Legacy TRU Waste Disposal Plan
LUR	land use request
LWA	<i>Waste Isolation Pilot Plant Land Withdrawal Act</i> (as amended)

LWB	Land Withdrawal Boundary
m	meter
m/s	meter per second
m ²	square meter
m ² /d	square meter per day
m ³	cubic meter
m ³ /min	cubic meter per minute
MAPEP	Mixed Analyte Performance Evaluation Program
MDC	minimum detectable concentration
MDL	method detection limit
MEI	maximally exposed individual
mg/L	milligrams per liter
mi	mile (statute)
MLLW	mixed low-level waste
mm	millimeter
MOC	management and operating contractor (also M&O)
MOU	Memorandum of Understanding
mrem	millirem
MRL	method reporting limit
MS/MSD	matrix spike/matrix spike duplicate
mSv	millisievert
N/A	not applicable
ND	not detected/non-detect
NELAP	National Environmental Laboratory Accreditation Program
NEPA	<i>National Environmental Policy Act</i>
NESHAP	National Emission Standards for Hazardous Air Pollutants
NM	New Mexico
NMAC	New Mexico Administrative Code
NMDA	New Mexico Department of Agriculture
NMDHSEM	New Mexico Department of Homeland Security and Emergency Management
NMED	New Mexico Environment Department
NMIMT	New Mexico Institute of Mining and Technology
NMSA	New Mexico Statutes Annotated
NPDES	National Pollutant Discharge Elimination System
NPDWR	National Primary Drinking Water Regulations
NR	not reported
NS	not sampled
ODS	ozone depleting substance
Order	Settlement Agreement and Stipulated Final Order
P2	Pollution Prevention
PA	Performance Assessment

PAS	portable air sampler
PAW	Perched Anthropogenic Water
PCB	polychlorinated biphenyl
Permit	WIPP Hazardous Waste Facility Permit
PFAS	per- and polyfluoroalkyl substance
PIC	Potential Impact Category
PIP	production-injection packer
PPA	Property Protection Area
ppbv	parts per billion by volume
ppmv	parts per million by volume
pptv	parts per trillion by volume
PT	proficiency testing
Q	qualifier
QA	quality assurance
QA/QC	quality assurance/quality control
QAO	quality assurance objective
QC	quality control
RCRA	<i>Resource Conservation and Recovery Act</i>
RER	relative error ratio
RPD	relative percent difference
RVMP	Repository VOC Monitoring Program
SARA	<i>Superfund Amendments and Reauthorization Act of 1986</i>
SDS	safety data sheet
SEC	Site Environmental Compliance
SERC	State Emergency Response Commission
SGS	SGS North America Inc.
SHS	Salt Handling Shaft
SIMCO	Salado Isolation Mining Contractors LLC
SNAP	Significant New Alternatives Policy
SNL	Sandia National Laboratories
SOO	sample of opportunity
SOP	standard operating procedure
SOW	statement of work
SPDV	Site and Preliminary Design Validation
SSCVS	Safety Significant Confinement Ventilation System
SSP	Site Sustainability Plan
Sv	sievert
SVOC	semi-volatile organic compound
SVS	Supplemental Ventilation System
SWDA	<i>Safe Drinking Water Act</i>
T&C	Terms and Conditions
T&E	threatened and endangered

TDS	total dissolved solids
TENORM	Technologically Enhanced Naturally Occurring Radioactive Material
TKN	total Kjeldahl nitrogen
TPQ	threshold planning quantities
TPU	total propagated uncertainty
TRI	toxic release inventory
TRU	transuranic
TSP	total suspended particulate
U	undetected (qualifier for radiological data)
U.S.	United States
U.S.C.	United States Code
USGS	United States Geological Survey
UST	underground storage tank
UTLV	upper tolerance limit value
UVS	Underground Ventilation System
VOC	volatile organic compound
WHB	Waste Handling Building
WIPP	Waste Isolation Pilot Plant
WLWA	WIPP Land Withdrawal Area
WOTUS	waters of the United States
yr	year

SYMBOLS

°C	degrees Celsius
°F	degrees Fahrenheit
>	greater than
≥	greater than or equal to
<	less than
≤	less than or equal to
μg	microgram
μmhos/cm	micromhos per centimeter
%	percent
+	detected (qualifier)
±	plus or minus
[RN]	radionuclide concentration
σ	sigma

CHEMICAL SYMBOLS

Note: A number preceding a chemical symbol denotes the mass number for the radionuclide/radioisotope (e.g., ²³⁸Pu), and two numbers (separated by a slash) preceding a chemical symbol indicate two radionuclides/radioisotopes that are not analytically separated (e.g., ^{239/240}Pu). When the symbol is not used for the chemical element, the mass number follows the element and is separated by a hyphen (e.g., plutonium-239/240).

Am	americium
Cl	chlorine
Co	cobalt
Cs	cesium
K	potassium
Na	sodium
Pu	plutonium
Sr	strontium
U	uranium

1.0 INTRODUCTION

This Annual Site Environmental Report (ASER) for calendar year (CY) 2025 demonstrates compliance with DOE reporting requirements by presenting environmental monitoring data that inform the public and assess whether site operations affect public health, worker safety, or the environment. This report is required by DOE Order 231.1B, *Environment, Safety and Health Reporting*, and was prepared in accordance with supplemental guidance (DOE, 2026). It is available to the public electronically at the following website: WIPP Home Page at <https://www.wipp.energy.gov/>.

Specifically, this ASER presents a summary of environmental data to:

- Characterize Waste Isolation Pilot Plant (WIPP) site environmental management performance.
- Summarize environmental occurrences and responses reported during the CY.
- Confirm compliance with environmental standards and requirements.
- Highlight significant environmental performance indicators and/or performance measures that reflect the size and extent of programs at the WIPP site, including progress toward the DOE Environmental Sustainability Goals made through implementation of the WIPP Environmental Management System (EMS).
- Summarize property clearance activities, including authorized limits, results of radiological monitoring and surveys of cleared property, types, and quantities of property cleared, and independent verification program results in accordance with DOE Order 458.1 “Radiation and Protection of the Public and the Environment.”

Located in southeastern New Mexico, the WIPP facility is the nation’s first and only underground repository permitted to dispose of transuranic (TRU) and TRU mixed waste generated through U.S. defense activities and programs. Transuranic waste is defined in the *Waste Isolation Pilot Plant Land Withdrawal Act* (LWA) (Public Law 102–579, as amended by Public Law 104–201) as radioactive waste containing more than 100 nanocuries (3,700 becquerels [Bq]) of alpha-emitting TRU isotopes per gram of waste, with half-lives greater than 20 years except for: (a) high-level radioactive waste; (b) waste that the Secretary [of Energy] has determined, with the concurrence of the Administrator [of the Environmental Protection Agency], does not need the degree of isolation required by the disposal regulations; or (c) waste that the Nuclear Regulatory Commission has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61, “Licensing Requirements for Land Disposal of Radioactive Waste.” The waste must meet the applicable criteria in the *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant* (DOE/WIPP-02-3122) in order to be eligible for disposal in the WIPP repository.

The TRU waste is disposed of approximately 655 m (2,150 feet [ft]) below the surface in excavated disposal rooms in the Salado Formation (Salado), which consists mostly of

thick beds of halite (rock salt) and anhydrite (calcium sulfate) layered with clay-rich seams and distinct marker beds. The WIPP repository is currently serviced by five shafts extending to the surface. Four vertical shafts connect the WIPP surface facility to the underground. These are the Waste Shaft, the Salt Handling Shaft, the Exhaust Shaft, and the Air Intake Shaft. A fifth shaft, Shaft #5 also connects the underground facility to the surface. All shafts will be sealed after the WIPP disposal phase. One of the main attributes of salt at the depth of the WIPP repository, as a rock formation to isolate radioactive waste, is the characteristic of the salt to creep; that is, to deform continuously over time until emplaced waste is encapsulated. A detailed description of the WIPP geology and hydrology is in chapter 6.

1.1 WIPP MISSION

The WIPP Project's mission is to provide safe, compliant, and efficient characterization, certification, transportation and disposal of defense related TRU waste.

1.2 WIPP HISTORY

National studies of disposal media began in the 1950s; in 1957 the National Academy of Sciences identified salt as a promising disposal medium. Site-specific investigations in southeastern New Mexico began in the early 1970s. The Salado Formation at the repository horizon has very low permeability and creep behavior that are evaluated as part of WIPP's long-term performance assessment; overlying water-bearing units are monitored under the groundwater program. After a search for an appropriate site for the disposal of radioactive waste throughout the 1960s, the salt deposits in southeastern NM were tested in the early 1970s. Salt and other evaporite formations at the WIPP site were deposited in thick beds during the evaporation of the Permian Sea. These geologic formations consist mainly of halite (NaCl). The Salado that serves as the host rock for the WIPP repository is approximately 610 m (2,000 ft) thick, begins 259 m (850 ft) below the Earth's surface at the WIPP site, and constitutes a stable geologic environment.

Congress authorized the construction of the WIPP facility in 1979, and the DOE constructed it during the 1980s. In late 1993, the DOE created the Carlsbad Area Office, subsequently redesignated as the Carlsbad Field Office (CBFO), to lead the TRU waste disposal effort. The CBFO coordinates the National TRU Program throughout the DOE complex.

1.3 SITE DESCRIPTION

Located in Eddy County in the Chihuahuan Desert of southeastern NM (figure 1.0), the WIPP site encompasses 16 square miles. This part of NM is relatively flat and is sparsely inhabited, with little surface water. The center of the WIPP site is approximately 26 mi east of Carlsbad, NM, in an area known as Los Medaños.

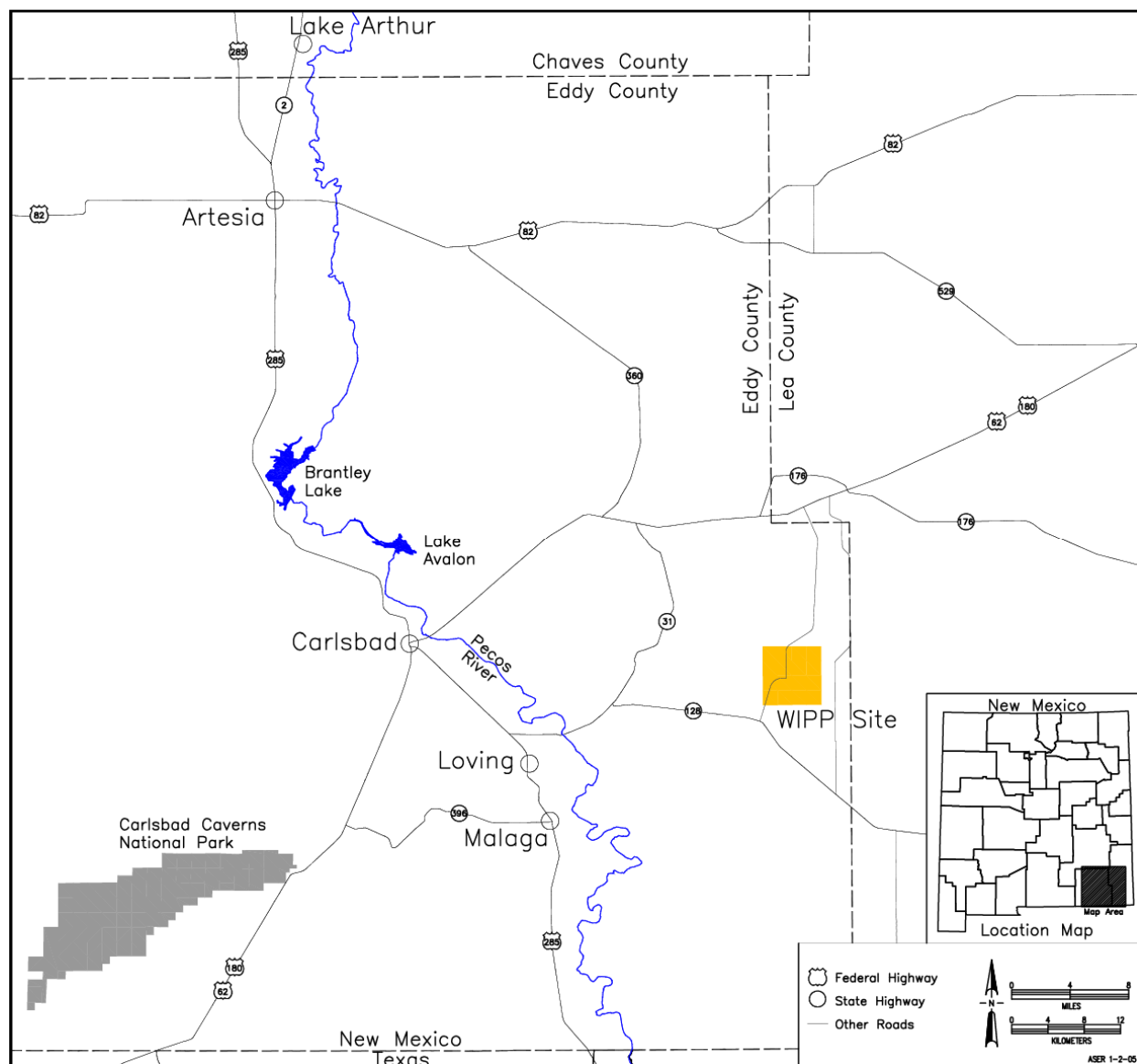


Figure 1.0 – WIPP Site Location

Most of the lands near the WIPP site are managed by the U.S. Department of the Interior Bureau of Land Management (BLM) and the New Mexico State Land Office. Land uses in the surrounding area include livestock grazing, potash mining, oil and gas exploration and production, and recreational activities such as hunting, camping, hiking, and bird watching. The area is home to diverse populations of animals and plants.

1.3.1 WIPP Property Areas

The LWA established a withdrawal area reserved for the WIPP facility. The withdrawal area is generally described as sections 15 through 22 and 27 through 34, all-inclusive, of Township 22 south, Range 31 east, New Mexico Principal Meridian. Property or functional areas are designated within the WIPP site boundary (figure 1.1).

Property Protection Area

The active portion of the facility, described as the Property Protection Area (PPA) in the Permit, is surrounded by a security barrier, which encompasses approximately 44 acres and provides security and protection for the major surface structures. A second PPA consisting of a nominal 22 acres surrounds Shaft #5.

Exclusive Use Area

The Exclusive Use Area (EUA) comprises approximately 293 acres. It is surrounded by a barbed-wire fence and is restricted exclusively for the use of the DOE and its contractors and subcontractors to support the project. This area is marked by warning signs (e.g., “No Trespassing”) and is patrolled by WIPP facility security personnel to detect unauthorized activities or uses.

Off-Limits Area

The Off-Limits Area boundary defines the exclusion zone. For a detailed description of the area included in the Off-Limits Area, refer to Federal Register [Document Number 94-18917](#). In the Off-Limits Area, unauthorized entry and introduction of weapons or dangerous materials is prohibited (as provided in 10 CFR §860.3 and §860.4). Pertinent prohibitions and penalties (10 CFR §860.5) are posted as directed in 10 CFR §860.6 along the perimeter of the Off-Limits Area, which encompasses approximately 1,454 acres. Livestock grazing and limited public thoroughfare will continue in this area unless these activities threaten the security, safety, or environmental quality of the WIPP site. This area is patrolled by WIPP facility security personnel to detect unauthorized activities or uses.

WIPP Land Withdrawal Area

The LWA was signed into law on October 30, 1992, transferring the administration of federal land from the U.S. Department of the Interior to the DOE. An amendment to this law was subsequently enacted on September 23, 1996. The WIPP site boundary or Land Withdrawal Boundary (LWB) delineates the perimeter of the WIPP Land Withdrawal Area (WLWA). This tract includes the PPA, the EUA, and the Off-Limits Area, as well as outlying areas open to public recreation within the LWB. Additional details for the property areas and access restrictions may be found in the *Waste Isolation Pilot Plant Land Management Plan* (LMP) (DOE/WIPP-93-004), available on WIPP Home Page at <https://www.wipp.energy.gov/>.

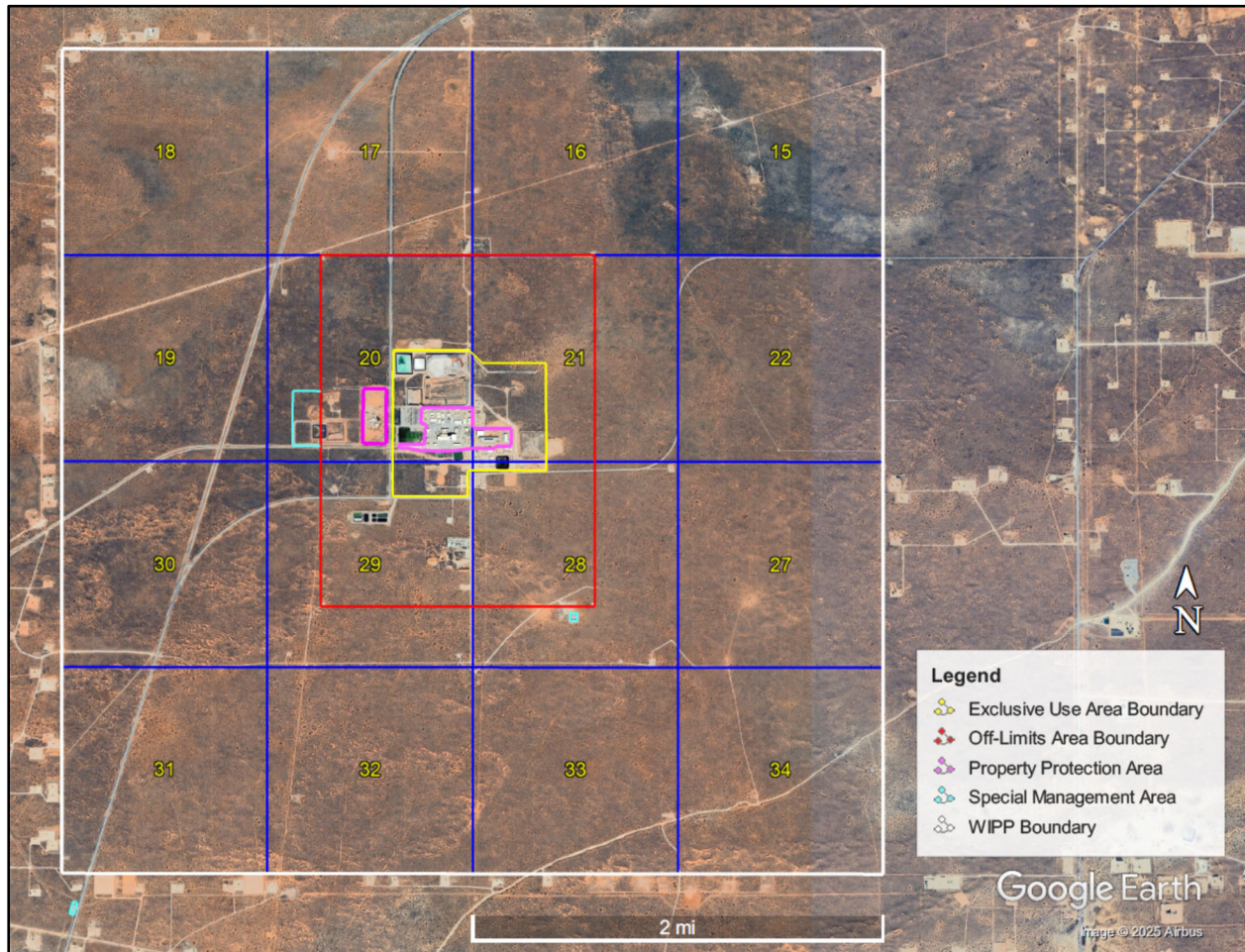


Figure 1.1 – WIPP Property Areas

Special Management Areas

Certain properties used in the execution of the WIPP Project (e.g., reclamation sites, well pads, roads) are, or may be, identified as special management areas in accordance with the LMP, which is described further in chapter 5. A special management area designation is made when resources and/or other circumstances meet the criteria for protection and management under special management designations. Unique resources of value that are in danger of being lost or damaged, areas where ongoing construction is occurring, fragile plant and/or animal communities, sites of archaeological significance, locations containing safety hazards, or sectors that could receive an unanticipated elevated security status would be suitable for designation as special management areas.

Several areas are considered special management areas due to safety hazards or ongoing construction. Evaporation Pond H-19 (H19), located in section 28, is removed from public access with fencing and postings. The western portion of the Shaft #5 construction area in section 20 is removed from public access by a barbed-wire fence. The salt storage pond within the Shaft #5 area is fenced and posted to prevent

unauthorized entry. The final special management area is an equipment storage area located southeast of section 31. This area, formerly used during WIPP road construction, is fenced and posted to prevent unauthorized entry.

1.3.2 Population

The number of permanent residents living within 10 mi (16 km) of the WIPP site is very small (less than 30). This permanent population is associated with ranching. The majority of the local population within 50 mi (80.5 km) of the WIPP site is concentrated in and around Carlsbad, Hobbs, Eunice, Loving, Jal, Lovington, and Artesia, NM. According to the 2020 census data, the population within this radius is 106,174. The nearest community is the village of Loving, 18 mi (29 km) west-southwest of the WIPP site, with a population of 1,390. The nearest major populated area is Carlsbad, 26 mi (42 km) west of the center of the WIPP site. The 2020 census reported the population of Carlsbad as 32,238. Since 2010, two periods of rapid growth have occurred due to oil field activity, reflected in the 2020 census. More detail is given in the WIPP LMP (DOE/WIPP-93-004, Reprint I) regarding the variations in population around the WIPP facility for recent census periods.

1.4 ENVIRONMENTAL STEWARDSHIP AT THE WIPP FACILITY

The DOE policy is to conduct its operations in compliance with applicable environmental laws and regulations and to safeguard the integrity of the southeastern NM environment. Effluent monitoring, environmental surveillance, land management, and assessments are conducted to verify these objectives are met. Environmental monitoring includes collecting and analyzing environmental samples from various media and evaluating whether WIPP facility operations have caused any adverse environmental impacts.

1.4.1 Environmental Monitoring Plan

The *Waste Isolation Pilot Plant Environmental Monitoring Plan* (DOE/WIPP-99-2194), available on WIPP Home Page at <https://www.wipp.energy.gov/>, outlines the program for monitoring the environment at and around the WIPP site, including the major environmental monitoring and surveillance activities at the facility. The plan discusses the WIPP Project quality assurance/quality control (QA/QC) program as it relates to environmental monitoring. The plan's purpose is to describe the implementation of an environmental monitoring program for determining any effects of WIPP facility operations on the local ecosystem. Effluent and environmental monitoring data are necessary to demonstrate compliance with applicable environmental protection regulations. A description of environmental sampling performed in the CY and the respective sampling frequency is provided in table 1.1.

Table 1.1 – Environmental Monitoring Sampling*(Refer to the end of the table for notes)*

Program	Type of Sample	Sampling Locations ¹	Sampling Frequency
Radiological	(1) Airborne effluent particulate	Primarily 2 (Station C, and Stations B and G for Exhaust Shaft outflow, see section 4.0 for details)	Periodic/confirmatory (batched as monthly or quarterly composites).
	(2) Airborne ambient particulate ²	11	Weekly (batched as quarterly composites).
	(3) Liquid effluent	Waste Handling Shaft sump and other collection points	As needed.
	(4) Biotic (wild fauna): Quail species, Rabbits (Desert Cottontail), Javelina (Collared Peccary), Mule Deer	Per permit authorizing collection	As available.
	(5) Biotic (Beef)	WIPP vicinity	As available and as permitted by rancher.
	(6) Vegetation	6	Annual, as available.
	(7) Soil	6	Annual, as available.
	(8) Surface water	15 (12 co-located with sediment and 3 on site)	Annual, as available.
	(9) Sediment	12	Annual, as available.
	(10) Groundwater ³	6	Annual.
	(11) H19, PAW, and Dewey Lake wells (DP-831, conditions 41 and 57, respectively)	20 (H19 and 19 wells)	Minimum one sample within the first year of DP-831 (requirement met in CY 2022).
Non-radiological	(12) Meteorology	1	Continuous
	(13) VOC Monitoring	See below	Per Permit Part 4 and Attachment N.
	• VOCs – Repository Monitoring (surface)	2	Two times per week.
	• VOCs – Disposal Room Monitoring	Varies based on number of rooms with emplaced waste in active panel	Routinely once every two weeks; increasing to weekly as needed per Permit conditions.
	(14) Groundwater ³	6	Annual.

Program	Type of Sample	Sampling Locations ¹	Sampling Frequency
	(15) Perched anthropogenic water and Dewey Lake wells (DP-831, conditions 57, 58, and 59)	19	Minimum one sample within first year of DP-831 and semi-annual from PZ-1, PZ-5, PZ-6, PZ-7, PZ-9, PZ-10, PZ-11, PZ-12, PZ-13, PZ-14, PZ-15, PZ-16, PZ-17a, PZ-17b, PZ-18, PZ-19a, C-2507, C-2811, WQSP-6a (one sample requirement met in 2022).
	(16) H19 and Salt Storage Pond 4 ⁴ (DP-831, condition 40)	2	Semi-annual.
	(17) Effluent Lagoon A (DP-831, condition 34)	1	Semi-annual.
	(18) Effluent Lagoon B and C (DP-831, condition 35)	2	Only after industrial wastewater has been discharged into the impoundment(s).
	(19) Stormwater Ponds 1, 2, and 3 (DP-831, condition 39)	3	Annually after a significant storm event. ⁵
	(20) Salt Storage Ponds 1, 2, 3, and 5 (DP-831, condition 47)	4	Annually after a significant storm event. ⁵
	(21) H19 inorganics and organics (DP-831, conditions 41 and 42, respectively)	1	Minimum one sample within the first year of DP-831 (requirement met in 2022).
	(22) Brine Retention Pond East (BRPE) and Brine Retention Pond West (BRPW) ⁶ (DP-831, condition 44).	2	Quarterly rotation, minimum of four consecutive quarterly sampling events.

1. Values presented are location counts. Actual sample numbers may be higher when including duplicates and blanks. The number of certain types of samples taken can be impacted by access restrictions or location conditions. For example, during dry periods there may be no surface water or infiltration control water to sample and some wells may be dry. Likewise, the number of samples for biota will also vary. For example, the number of rabbits available as samples of opportunity will vary.
2. Seven legacy locations have two samplers running simultaneously generating a primary sample and an additional sample which is used for event evaluation or backup. Four locations are sampled only for use in an event evaluation. Each week this results in 18 samples, but routinely only seven samples are analyzed (one from each legacy location). Weekly legacy samples are then combined into quarterly composites.
3. Detection Monitoring Wells – sampling includes radiological and non-radiological program components.
4. Salt Storage Pond 4 has not been commissioned; therefore, sampling did not occur in the CY.
5. A significant storm event is defined as the DP-831 threshold of 2 inches or greater in a 24-hour period.
6. BRPE and BRPW have not been commissioned, therefore sampling did not occur in the CY.

The Environmental Monitoring Plan describes the monitoring of naturally occurring and specific anthropogenic radionuclides. The geographic scope of radiological sampling is based on projections of potential release pathways from the waste disposed of at the WIPP facility. The plan also describes monitoring of volatile organic compounds (VOCs), groundwater chemistry, other non-radiological environmental parameters, and meteorological data collection.

1.4.2 WIPP Facility Environmental Monitoring Program and Surveillance Activities

The management and operating contractor (MOC) of the WIPP facility (i.e., Salado Isolation Mining Contractors, LLC [SIMCO]) monitors air, surface water, groundwater, sediments, soils, and biota (e.g., vegetation, selected mammals, and quail). Environmental monitoring activities are performed in accordance with procedures that govern how samples are to be collected, preserved, and transferred. Procedures direct the verification and validation of environmental sampling data.

The atmosphere, which can lead to the dispersion and inhalation of radionuclides, has been determined to be the most likely release pathway to the public from the WIPP facility before the final closure. Therefore, airborne particulate sampling for TRU components is emphasized. Air sampling results are used to trend environmental radiological levels and determine if there has been a deviation from established baseline values. The geographic scope of radiological sampling is based on projections of potential release pathways and nearby populations for the types of radionuclides in TRU wastes managed at the WIPP facility and includes Carlsbad and ranches. Non-radiological environmental monitoring activities at the WIPP site consist of sampling and analyses designed to detect and quantify the impacts of operational activities and verify compliance with applicable requirements.

1.5 ENVIRONMENTAL PERFORMANCE

The DOE is committed to environmental protection and the implementation of sound stewardship practices that protect the air, water, land, and other natural and cultural resources. Provisions for protection are implemented via the WIPP Project environmental policy and the WIPP EMS. Sustainability goals, as directed by the DOE, are achieved through the *Site Sustainability Plan* (SSP) (DOE, 2024) and the WIPP EMS (see chapter 3).

Implementing the *Waste Isolation Pilot Plant Environmental Monitoring Plan* (DOE/WIPP-99-2194) fulfills the environmental monitoring requirements of DOE Order 458.1, DOE's Energy and Water Management goals, and Federal, State, and Local Regulations. The DOE's expectation is to ensure continued protection of workers, the public, and the environment. The remaining chapters include detailed information on the WIPP Project's environmental programs.

2.0 COMPLIANCE STATUS

The following summary tables provide an overview of environmental compliance obligations (Table 1), Major Environmental Permits for WIPP (Table 2), summaries of NMED-issued violations for WIPP in 2025 (Tables 3a, 3b and 3c), and external assessment/audit results (Table 4).

Table 2.1 – Environmental Compliance Obligations Overview

Regulation Requirement	Compliance Overview	Report Sections
Comprehensive Environmental Response, Compensation, and Liability Act	The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (42 U.S.C. § 9601 1980), and amended in 1986, establishes liability compensation, cleanup, and emergency response requirements for inactive hazardous waste sites. In addition, CERCLA requires federal facilities to report hazardous substance spills to the National Response Center and perform any necessary response action. The Superfund Amendments and Reauthorization Act (SARA) Title III of 1986 (42 U.S.C. § 9601 1986) establishes additional reporting requirements that are addressed under Section 2.1.1.	Section 2.1
Resource Conservation and Recovery Act	The Resource Conservation and Recovery Act (RCRA), enacted in 1976, as amended (42 U.S.C. § 6901 et seq. 1976), sets forth the framework for managing hazardous solid waste, including the hazardous waste component of mixed waste. Wastes generated from ongoing activities and operations are collected and managed at several locations as described in Section 2.2. The Hazardous and Solid Waste Amendments (42 U.S.C. § 6901 et seq. 1984) amended RCRA, adding various requirements and deadlines, including requirements for corrective action for past releases of hazardous waste or hazardous constituents to the environment. The Federal Facility Compliance Act amended RCRA. In addition, underground storage tank requirements were added as Subtitle I to RCRA in 1984.	Section 2.2
National Environmental Policy Act	The National Environmental Policy Act (NEPA) of 1969 (42 USC § 4321 1969) is a law that requires federal agencies to assess the impacts of proposed actions on the human and natural environment prior to making decisions. DOE codified its NEPA-	Section 2.3

	implementing procedures in 10 CFR 1021, National Environmental Policy Act.	
Clean Air Act	The <i>Clean Air Act</i> (42 U.S.C. § 7401, et seq.) provides for air quality preservation, protection, and enhancement. Both the State of NM and the EPA have the authority to regulate compliance with portions of the <i>Clean Air Act</i>. Emissions of radionuclides are regulated by EPA via the National Emission Standards for Hazardous Air Pollutants (NESHAP). Radiological effluent monitoring in compliance with EPA standards is discussed in chapter 4.	Section 2.4 and Section 4
Clean Water Act	The Clean Water Act of 1972 (33 U.S.C. § 1251 1972) and amendments establishes a permitting structure and regulatory direction to protect the “waters of the United States” (WOTUS) by restoring and maintaining the chemical, physical, and biological integrity of United States waters; protecting fish, wildlife, and recreation; and reducing pollutant discharges. The WIPP facility is located in an area devoid of WOTUS. Stormwaters, wastewaters and groundwaters at WIPP are subject to the New Mexico Water Quality Act requirements.	Sections 2.5 and 2.6
Safe Drinking Water Act	The Safe Drinking Water Act of 1974, as amended (42 U.S.C. § 300f 1974), was established to protect the quality of drinking water in the United States, focusing on all waters actually or potentially designed for drinking use, whether from aboveground or underground sources. NMED characterizes this public water system as a non-transient non-community water system.	Section 2.7
National Historic Preservation Act	National Historic Preservation Act (NHPA), as amended, 54 USC 300101 et seq. (1966) identifies, evaluates, and protects historic properties eligible for listing in the National Register of Historic Places (NRHP). Such properties can be archeological sites, historic buildings and structures, historic districts, and objects, which includes artifacts, records, and material remains related to such a property. The act requires federal agencies to consider the effects of their undertakings on historic properties (Section 106), to identify and evaluate the eligibility of historic properties for	Section 2.8

	long-term management as well as for future project-specific planning.	
Toxic Substances Control Act	The Toxic Substances Control Act, enacted in 1976 and later amended (15 U.S.C. § 2601 et seq. 1976), regulates the manufacture, processing, distribution, use, and disposal of specific chemical substances and/or mixtures. Compliance with this act includes managing asbestos and polychlorinated biphenyls (PCBs). There are no PCB-contaminated transformers at WIPP. In 2024, the EPA issued Conditions of Approval granting reauthorization for the disposal of non-liquid PCBs contaminated with TRU wastes, and PCB/TRU waste mixed with hazardous waste.	Section 2.9
Federal Insecticide, Fungicide, and Rodenticide Act	The Federal Insecticide, Fungicide, and Rodenticide Act and corresponding New Mexico regulation (Pesticide Control Act) govern the manufacture, use, storage, and disposal of pesticides, herbicides, biocides, rodenticides, fungicides, tickicides, as well as the pesticide containers and residuals.	Section 2.10
Endangered Species Act	Endangered Species Act, 16 USC 1531-1544 (1973) provides a program for the conservation of threatened and endangered (T & E) plants and animals and the habitats in which they are found. The law also prohibits any action that causes “take” of any listed species of endangered fish or wildlife. The New Mexico Wildlife Conservation Act protects state-listed T & E species.	Section 2.11
Migratory Bird Treaty Act	The Migratory Bird Treaty Act of 1918 (16 U.S.C. § 703 et seq. 1918) implemented the 1916 convention for the protection of migratory birds. The original statute implemented the agreement between the United States and Great Britain (for Canada) and later amendments implemented treaties between the United States and Mexico, the United States and Japan, and the United States and Russia. The act prevents the taking, possession, killing, transportation, and importation of migratory birds or their eggs, parts, and nests.	Section 2.12
Atomic Energy Act	The Atomic Energy Act of 1954 (42 U.S.C. § 2011 1954) specifies proper management of source, special nuclear, and by-product material. DOE has the authority to manage operations based on applicable statutes,	Section 2.14

	federal regulations, and DOE directives. WIPP personnel achieve compliance through adherence to these directives and applicable regulations in 10 CFR 830, Nuclear Safety Management (10 CFR 830 2016), and 10 CFR 835, Occupational Radiation Protection (10 CFR 835 2021). The regulations include radiation protection standards, limits, and program requirements for protecting individuals from radiation exposure resulting from DOE activities.	
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Table 2.2 –Major Environmental Permits for the Waste Isolation Pilot Plant During Reporting Period

Granting Agency	Type of Permit	Permit Number	Granted/ Submitted	Expiration	Status During 2025
New Mexico Environment Department	Hazardous Waste Facility Permit	NM489013908 8-TSDF	10/04/2023 effective 11/03/2023	11/02/2033	Active
New Mexico Environment Department Groundwater Quality Bureau	Discharge Permit	DP-831	01/28/2022	01/27/2027	Active
New Mexico Environment Department Air Quality Bureau	Operating Permit for Two Backup Diesel Generators	310-M-2	12/07/1993	None	Active
New Mexico Environment Department Petroleum Storage Tank Bureau	Petroleum Storage Tank Registration Certificate	Registration Number 2175 Facility Number 31539	07/01/2025	06/30/2026	Placed out of service on March 15, 2025; permanent closure planned for 2027
U.S. Environmental Protection Agency Region 6	Conditions of Approval for Disposal of PCB/TRU and PCB/TRU Mixed Waste at the U.S. Department of Energy (DOE) Waste Isolation Pilot Plant (WIPP) Carlsbad, NM	N/A	04/11/2024	04/11/2029	Active

Granting Agency	Type of Permit	Permit Number	Granted/ Submitted	Expiration	Status During 2025
U.S. Fish and Wildlife Service	Special Purpose – Relocate	MB155189-2	04/01/2023	03/31/2026	Active
New Mexico Department of Game and Fish	Biotic Collection Permit	Authorization № 3293	12/16/2022	12/31/2025	Active

N/A = Not applicable

Table 2.3 – Environmental Violations Cited by Regulators/Noncompliance Areas

Settlement Agreement and Stipulated Final Order No. HW-24-53 signed 2/25/25			
Violation	Relevant Regulations	Corrective Actions (Terms and Conditions (T & C))	Resolution
Unlabeled box of Universal Waste (UW) observed by NMED on 4/17/23	40 CFR 273.14(e) NMAC 20.4.1.1001(B)	T & C 22: Initiate a community education program on waste minimization and hazardous materials within 90 days of this order. T & C 23: Revise waste accumulation area procedure inspection checklists to include inspection criteria for housekeeping within 60 days of this order.	As of 11/12/25 the NMED Resource Protection Compliance and Enforcement Bureau acknowledged that WIPP has taken all corrective actions and paid the \$2,637 civil penalty.
Accumulation of combustible materials	40 CFR 264.31 NMAC 20.4.1.500	T & C 24: Include a training component in training materials for Hazardous Waste Worker (HWW) Supervisor training and HWW training to highlight the importance of housekeeping at WIPP within 60 days of this order.	
Unlabeled drum of used oil observed by NMED on 4/2/24	40 CFR 279.22(c)(1) NMAC 20.4.1.1003(A)	T & C 25: Include a training component in the HWW Supervisor training and RCRA Regulations/Hazardous Waste Facility Permit Overview training to highlight the requirements for labeling UW and used oil within 60 days of this order. T & C 26: Evaluate the feasibility of eliminating mercury lamp usage at	

		WIPP and provide a plan and schedule to phase out the continued use of mercury lamps within 180 days from the date of the order. T & C 27: Publish a site-wide "lessons learned " regarding good housekeeping and proper labeling.	
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Table 2.4 – Environmental Violations Cited by Regulators/Noncompliance Areas

Routine NMED HWB Inspection on 5/12/25			
Violation	Relevant Regulation(s)	Corrective Actions	Resolution
Failure of Large Quantity Generator (LQG) of hazardous waste to contact a designed facility within 35 days of the date the waste was accepted by the initial transporter when the return hazardous waste manifest had not been received by the LQG from the Treatment, Storage, Disposal Facility (TSDF).	40 CFR 262.42(a)(1); NMAC 20.4.1.300	WIPP submitted an exception report and self-reported contacting the TSDF after 42 days of not receiving the final copy of the hazardous waste manifest with the handwritten signature from a representative of the destination facility.	NMED determined that no further action was required.
Failure to maintain communications or alarm systems, fire protection equipment, spill control equipment and decontamination equipment, where required.	40 CFR 264.32(a); HWFP Condition 2.10.1.1 and NMAC 20.4.1.500	The PA system at the 474 Central Accumulation Area was found to be inoperable on 4/10/24, but was found to be operable on 6/17/24.	NMED determined that the violation has been corrected, and no further action is required.
Failure to have fire control equipment as described in Permit Attachment D. Fire Engine 2 was noted as out of service between 2/3/25 and 3/20/25. Fire Engine 24 was brought into service to meet the minimum requirement of two fire trucks with rescue equipment to assist in fighting fires and emergency rescue,	40 CFR 264.32(c); HWFP Condition 2.10.1.3 and NMAC 20.4.1.500	This violation was corrected on 3/20/25 when Fire Engine 2 was brought back into service.	NMED determined that no further action was required.

but lacked equipment as required by NFPA 1901.			
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Table 2.5 – NMED Administrative Order No. HWB-25-04 from 7/29/25

Violation	Relevant Regulation(s)	CBFO/SIMCO Response(s)
Failure to Maintain Facility Infrastructure in Good Repair	HWFP Part 1, Section 1.7.7	SIMCO requested an Administrative Hearing to dispute these violations and request dismissal of the ACO on August 25, 2025. On 8/28/25 NMED ordered that a hearing be held and appointed a hearing officer. On 12/5/25 NMED established a procedural calendar for the hearing that did not begin until 2026.
Failure to Maintain Evacuation Equipment as Required by the Permit	HWFP Part 2, Section 2.10.1	
Failure to Address Identified Equipment Deficiencies	HWFP Attachment E, Section E-1	
Failure to Maintain Equipment Integrity Required for Design Basis	HWFP Attachment A2-2a(1)	
Inaccurate and Outdated Infrastructure Condition Data	HWFP Part 1, Section 1.7.7	

Table 2.6 – Assessments/Audits and Associated Major Issues

Assessment/Audit	Date	Auditor	Results/Major Issues Identified	Correction Actions
Triennial Audit of RCRA, New Mexico Hazardous Waste Act, TSCA and PCB Conditions of Approval	March to July, 2025	Firewater Associates, LLC and Longenecker & Associates	The review team concluded that the permittees have done an outstanding job of managing compliance in these regulatory areas./None	None
WIPP Waste Management Program (Generator) Audit	March 20, 2025	Waste Control Specialists (WCS), LLC	LATA and SIMCO were found to have an acceptable waste management program. WCS authorized WIPP to ship waste materials to their Federal Waste Disposal Facility./None	None

The DOE must comply with the applicable regulations promulgated pursuant to federal and state statutes, DOE orders, and executive orders (EOs) regarding the WIPP facility.

Facility plans and implementing procedures ensure compliance with regulatory requirements. Methods used to maintain compliance with environmental requirements include engineered controls, written procedures, routine training of facility personnel, ongoing self-assessments, and personal accountability. The following sections list the environmental statutes and regulations applicable to the operation of the WIPP facility and describe significant accomplishments and ongoing compliance activities. A detailed breakdown of WIPP facility compliance with environmental laws is available in the *Waste Isolation Pilot Plant Biennial Environmental Compliance Report* (DOE/WIPP-22-3526).

2.1 COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT

The *Comprehensive Environmental Response, Compensation, and Liability Act* (42 U.S.C. [United States Code] §9601, et seq.), or Superfund Act, and the *Superfund Amendments and Reauthorization Act of 1986* (SARA) establish a comprehensive federal strategy for responding to and determining liability for releases of hazardous substances from a facility to the environment. Spills of hazardous substances that exceed a CERCLA reportable quantity at 40 CFR 302.4 must be reported to the National Response Center under the provisions of *Comprehensive Environmental Response, Compensation, and Liability Act*, and 40 CFR Part 302, "Designation, Reportable Quantities, and Notification." Hazardous substance cleanup procedures are specified in 40 CFR Part 300, "National Oil and Hazardous Substances Pollution Contingency Plan."

2.1.1 Superfund Amendments and Reauthorization Act of 1986

The DOE is required by the SARA Title III (42 U.S.C. § 11001 et seq., also known as the *Emergency Planning and Community Right-to-Know Act* [EPCRA]), which is implemented pursuant to 40 CFR Parts 350 through 399, to submit (1) a list of hazardous chemicals present at the facility over the threshold planning quantities (TPQ) or 10,000 pounds for which Safety Data Sheets (SDSs) are required; (2) an Emergency and Hazardous Chemical Inventory Form (Tier II Form) that provides types, quantities and locations of hazardous chemicals stored each year at WIPP; and (3) notification to the State Emergency Response Commission (SERC), the Local Emergency Planning Committee (LEPC), and fire departments with jurisdiction over the facility in the case of an emergency event at the site. Submitting a list of hazardous chemicals or hazardous chemical SDSs meeting or exceeding the applicable thresholds is a one-time notification, provided no new hazardous chemicals are stored at or above applicable reporting threshold levels or existing hazardous chemical SDSs are significantly revised. Any new hazardous chemical subject to reporting requirements or a significantly revised SDS is reported within three months after discovery and within 30 days of any request made by the LEPC.

The SARA Tier II Report, due annually on March 1, provides State and local officials and the public with specific information on the amounts and locations of hazardous chemicals present at WIPP during the previous CY. Specifically, for WIPP, the SARA Tier II Report must be sent to the New Mexico Department of Homeland Security and Emergency Management (NMDHSEM), Eddy County LEPC, and cities of Carlsbad and

Hobbs fire departments. The CY 2025 Tier II Report for the WIPP facility was submitted electronically utilizing the U.S. Environmental Protection Agency's (EPA) online Tier2 Submit™ Software prior to March 1, 2026, as required by 40 CFR Part 370, "Hazardous Chemical Reporting: Community Right-To-Know" and in compliance with EPCRA, Section 312. This report included the revised physical and health hazard classifications associated with the WIPP facility onsite chemical inventory (see table 2.7).

Title 40 CFR Part 372, "Toxic Chemical Release Reporting: Community Right to Know," requires facilities to submit a toxic chemical release report to the EPA and the resident state, identifying the toxic chemicals disposed of or released at the facility more than established threshold amounts. The CY 2025 Toxic Release Inventory (TRI) Report was submitted electronically on the EPA Central Data Exchange (CDX) website utilizing the software TRIMEweb™ before July 1, 2026. The CDX website (cdx.epa.gov) submits the TRI report to EPA the report to the SERC, or NMDHSEM. Table 2.7 presents the CY 2025 EPCRA regulatory sections, reporting requirements, and corresponding submission status.

Table 2.7 – Emergency Planning and Community Right-to-Know Act (EPCRA) Reporting Requirements

Emergency Planning and Community Right-to-Know Act Sections	Facility Reporting Requirements	Submission Status
EPCRA Section 302–303 (40 CFR Part 355 Subpart B)	Emergency Planning & Emergency Response Notification	Further notification not required at this time. ¹
EPCRA Section 304 (40 CFR Part 355, Appendices A & B)	Notification of a Hazardous Substance Release or Extremely Hazardous Substance Release Above Reportable Quantities	Not required; facility did not have any hazardous substance released of reportable quantity.
EPCRA Section 311–312 (40 CFR Part 370)	Hazardous Chemical Reporting (Tier II Report)	Yes ²
EPCRA Section 313 (40 CFR Part 372)	Toxic Chemical Release Reporting (TRI Report)	Yes ²

1. The facility is subject to emergency planning requirements; however, further notification is only required when significant changes are implemented to the existing plan.
2. Reporting notification requirements were satisfied and submitted by the applicable deadline.

2.1.2 Unplanned Releases of Reportable Quantities of Hazardous Substances

There were no unplanned releases of hazardous substances or extremely hazardous substances exceeding CERCLA the reportable quantity thresholds at CFR 302.4 during CY 2025.

2.2 RESOURCE CONSERVATION AND RECOVERY ACT

The *Resource Conservation and Recovery Act* (RCRA) (42 U.S.C. §6901, et seq.) was enacted in 1976. Initial implementing regulations were promulgated in May 1980. This body of regulations ensures that hazardous waste is managed and disposed to protect human health and the environment. The *Hazardous and Solid Waste Amendments of*

1984 (Public Law 98–616, Stat. 3221) prohibit land disposal of hazardous waste unless treatment standards are met, or specific exemptions apply. The amendments also emphasize waste minimization. Section 9(a) of the WIPP LWA exempts TRU mixed waste designated by the Secretary of Energy for disposal at the WIPP facility from the treatment standards. Such waste is not subject to the land disposal prohibitions of the *Solid Waste Disposal Act* (42 U.S.C. §6901–6992k). The Federal Facilities Compliance Act amended the Solid Waste Disposal Act to waive the sovereign immunity of the United States for purposes of enforcing Federal and state requirements with respect to solid and hazardous waste management.

The NMED is authorized by the EPA to implement the hazardous waste program in NM pursuant to the *New Mexico Hazardous Waste Act* (New Mexico Statutes Annotated [NMSA] §74-4-1, et seq., 1978). The technical standards for hazardous waste treatment, storage, and disposal facilities in NM are outlined in 20.4.1.500 New Mexico Administrative Code (NMAC), which adopts, by reference, 40 CFR Part 264, “Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities.” The hazardous waste management permitting program is administered through 20.4.1.900 NMAC, which adopts 40 CFR Part 270, “EPA Administered Permit Programs: The Hazardous Waste Permit Program.”

2.2.1 Hazardous Waste Facility Permit

The WIPP Permit authorizes the DOE and the MOC (collectively known as the Permittees) to manage, store, and dispose of contact-handled (CH) and remote-handled TRU mixed waste at the WIPP facility. Two storage units (the Parking Area Unit and the Waste Handling Building [WHB] Unit) are permitted to store TRU mixed waste. Ten underground hazardous waste disposal units (HWDUs) or panels are currently permitted to dispose of contact-handled and remote-handled TRU mixed waste. Seven of these Panels are filled/closed, one is actively receiving waste and 2 are pending construction.

On August 20, 2024, the NMED issued an Administrative Compliance Order (ACO) (No. HWB-25-01) to the CBFO and to SIMCO based on their WIPP facility annual inspection conducted on April 17, 2023, by the NMED. On February 25, 2025, the NMED, CBFO, and SIMCO entered into Settlement Agreement and Stipulated Final Order (No. HWB-24-53) to resolve all alleged violations outlined in the ACO. The NMED issued on November 12, 2025, a Notice of Resolution of ACO HWB-25-01.

On May 12, 2025, the NMED conducted a RCRA WIPP facility inspection at the WIPP facility. The inspection focused on the implementation of RCRA requirements applicable to both site-generated hazardous wastes and TRU mixed wastes authorized by the Permit for receipt, management, storage, and disposal at the WIPP facility. During this reporting period, the formal results of the inspection have not been issued by the NMED.

On July 25, 2025, the NMED issued an ACO (No. HWB-25-04) to the CBFO and to SIMCO. The NMED cited infrastructure issues described in a June 18, 2025 letter from the Defense Nuclear Facilities Safety Board (DNFSB) to the DOE and the June 24, 2025 U.S. Government Accountability Office (GAO) published report GAO-25-107333.

In the ACO, the NMED alleged that five potential violations had been identified by the DNFSB letter and GAO Report. The alleged violations include 1) Failure to maintain Facility Infrastructure in good repair, 2) Failure to maintain Evacuation Equipment as required by the Permit, 3) Failure to address Identified Equipment Deficiencies, 4) Failure to maintain Equipment Integrity Required for Design-Basis Events, and 5) Inaccurate and Outdated Infrastructure Condition Data.

On June 9, 2025, the DOE Office of Environmental Management responded to the GAO Report (GAO-25-107333; June 24, 2025). In this response, the DOE concurred with the GAO's three (3) recommendations and provided responses to those recommendations.

On August 25, 2025, the Permittees formally responded to the NMED (HWB-25-04) denying all allegations and requested a hearing be conducted in this matter. In this response the Permittees identified that the WIPP facility is safely operated, the transport and disposal of hazardous waste is in compliance with applicable laws, regulations, and the Permit.

On December 8, 2025, the DOE Office of Environmental Management provided a response to the DNFSB Letter (June 18, 2025). The DOE response provides details of the DOE's infrastructure management approach, completed and planned hoisting reliability improvements (figure 2.0), and system health monitoring protocols at WIPP. The DOE response asserted the WIPP facility operations are conducted in a manner that ensures continued safety.

The resolution to the NMED ACO (HWB-25-04) is ongoing.



Figure 2.0 – The Salt Hoist Pocket Project

The Third Triennial Review Final Report (dated July 28, 2025) of the WIPP is the result of a Settlement Agreement entered into with the NMED. Paragraph 34 of the Settlement Agreement and Stipulated Final Order No. HWB-14-21 (CO) dated January 22, 2016, specified “DOE will fund independent, external triennial reviews of environmental regulatory compliance and operations at WIPP to ensure that any regulatory deficiencies are identified.” The Final Report was submitted to the NMED on August 14, 2025.

The Review was a systematic, independent, and documented process of objectively obtaining and evaluating evidence to determine whether specified environmental regulatory requirements are met at the WIPP. The Review evaluated the integrity of the regulatory compliance processes implemented at the WIPP facility under legislation, permits (including the Hazardous Waste Facility Permit), DOE Orders, notices, and agreements. The independent Review Team concluded that, overall, the Permittees have done an outstanding job of maintaining compliance in the regulatory areas evaluated as part of the Review. The Review Team evaluated 621 individual criteria across nine different regulatory areas that included document reviews and interviews with WIPP facility personnel. The Review Team did not identify any non-compliances; however, two observations were identified as areas where improvements can be made to mitigate or eliminate areas of risk/vulnerability.

2.2.2 Modification Requests

In CY 2025, the Permittees submitted permit modification notifications and permit modification requests to NMED, as described in table 2.8. In accordance with Permit Part 1, Section 1.14, Information Repository (IR), Permit modification notifications and requests associated with the Permit, along with associated responses from the regulator, were posted to the IR on the Permittees' webpage (WIPP Home Page at <https://www.wipp.energy.gov/>) within 10 calendar days. Additionally, other information required by the Permit was provided in the IR.

Table 2.8 – Permit Modification Notifications and Requests Submitted in CY 2025

Class	Description	Date Submitted
1	Update Permit Attachment D, Table D-1, Resource Conservation and Recovery Act Emergency Coordinators Update Description of Property Protection Area, in Permit Attachment A, Section A-3	April 3, 2025
1	Update Permit Attachment D, Table D-1, Resource Conservation and Recovery Act Emergency Coordinators Update Permit Attachment D, Section D-7, Emergency Response Agreements and D-9, Location of the RCRA Contingency Plan and Plan Revision	May 29, 2025
1	Update Permit Attachment D, Figure D-1, Waste Isolation Pilot Plant (WIPP) Surface Structures, Permit Attachment D, Figure D-2, Spatial View of the WIPP Facility; Permit Attachment M, Figure M-58, WIPP Traffic Flow Diagram	July 25, 2025
1	Update Permit Part 4, Table 4.6.2.3, Recommended EPA Risk Factors Update Permit Attachment D, Table D-1, Resource Conservation and Recovery Act Emergency Coordinators Update Permit Attachment D, Figure D-3, Underground Escape and Evacuation Map	October 9, 2025

2.2.3 Underground Storage Tanks

Federal regulation 40 CFR Part 280, "Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (USTs)," addresses USTs containing petroleum products or hazardous chemicals. Requirements for UST management pertain to the design, construction, installation, and operation of USTs, as well as notification and corrective action requirements in the event of a release, and actions required for out-of-service USTs. The EPA has authorized the

NMED to regulate USTs and implements the EPA program through 20.5 NMAC, "Petroleum Storage Tanks."

At the beginning of the CY, the WIPP facility operated two regulated USTs—one for diesel and one for unleaded gasoline. In a February 24, 2025, post-inspection report, the NMED identified four Class B violations identified during an inspection of the USTs on February 10, 2025. During this inspection, the intent to close the tank systems was communicated to the inspector. The facility subsequently submitted a 30-day temporary closure notice to NMED on February 18, 2025, indicating the tanks would be temporarily closed by March 15, 2025. Effective March 15, 2025, both USTs were placed in temporary closure, in compliance with 20.5.115.1501.B NMAC. The WIPP facility submitted a request to NMED for an extension of time to permanently close the USTs by March 15, 2027, which was subsequently granted by the NMED. The facility has transitioned to above-ground storage tanks (ASTs), which are exempt from 20.5 NMAC regulations because each new fuel tank has a capacity under 1,320 gallons and are not manifolded together [20.5.101.2.D(3) NMAC]. While plans to permanently close the two USTs are underway per 20.5.115.1502 NMAC, the facility will maintain current NMED registration and comply with regulations until the closure is finalized.

2.2.4 Hazardous Waste Generator Compliance

Non-radioactive hazardous waste is currently generated through routine facility operations. Mixed low-level radioactive waste (i.e., low-level radioactive wastes known or suspected to contain hazardous constituents) is generated at the WIPP facility because of the cleanup from the February 2014 radiological release.

Hazardous wastes are managed in satellite accumulation areas. The WIPP site has a Central Accumulation Area (less-than-90-days storage area) on the surface, and a Central Accumulation Area (less-than-90-days storage area) underground. Hazardous waste is shipped to offsite treatment, storage, or disposal facilities that are permitted and licensed to treat and dispose of these types of wastes. Mixed low-level (radioactive) waste is segregated from hazardous waste, and low-level waste (LLW) is managed as mixed low-level waste (MLLW).

Mixed low-level waste is managed to comply with DOE Order 435.1, Administrative Chg. 2, *Radioactive Waste Management*. Mixed low-level waste is shipped to offsite treatment, storage, or disposal facilities that are permitted and licensed to treat and dispose of these types of wastes. During the CY, hazardous waste and MLLW samples were analyzed by GEL Laboratories, LLC, Charleston, SC. Hazardous wastes were sent to offsite facilities for disposal via Veolia North America, LLC, Henderson, CO, while LLW and MLLW were disposed of via Waste Control Specialists, LLC, Andrews, TX. Transuranic mixed waste generated as the result of operations is characterized as derived waste in accordance with the Permit and is managed as contact-handled TRU mixed waste at the WIPP facility.

2.2.5 Program Deliverables and Schedule

The Permittees met the Permit requirements to demonstrate compliance with reporting, as described below:

Permit Part 1, Section 1.7.14, Other Noncompliance, requires submission annually in October of other instances of noncompliance not otherwise required to be reported in Sections 1.7.10 through 1.7.13. The results of other noncompliance were reported as required in the annual October Noncompliance Report.

Permit Part 2, Section 2.4, Waste Minimization Program, requires submission of a report annually by December 1 for the year ending the previous September 30 regarding progress made in the waste minimization program in the previous year. This report was submitted to the NMED in November 2025.

Permit Part 2, Section 2.14.2, Biennial Report, requires the submittal of the biennial hazardous waste report, as required by 20.4.1.500 NMAC (incorporating 40 CFR § 264.75). The owner or operator must complete and submit the required data to the EPA management information system by March 1 of the following even-numbered year and must cover activities during the previous year. This report was submitted to the NMED in February 2024.

Permit Part 2, Section 2.14.3, Repository Siting Annual Report, requires submission of an annual report summarizing its progress toward siting another repository for TRU waste in a state other than NM. This report was submitted to the NMED in December 2025.

Permit Part 3, Section 3.1.1.4, Notification of CH Bay Surge Storage Use, requires a report by October 27 of each year summarizing CH Bay Surge Storage usage. The Permittees did not utilize CH Bay surge storage in this CY; thus, notification or report was unnecessary in this CY.

Permit Part 3, Section 3.1.2.4, Notification of Parking Area Surge Storage Use, requires a report by October 27 of each year summarizing Parking Area Surge Storage usage. The Permittees did not utilize Parking Area surge storage in this CY; thus, notification or report was not necessary in this CY.

Permit Part 4, Section 4.2.1.4, Prioritization and Risk Reduction of New Mexico Waste, requires that within 15 days of DOE publishing the Annual Transuranic Waste Inventory Report (ATWIR), the Permittees shall certify to the NMED there is sufficient TRU Mixed Waste Volume capacity in permitted HWDUs to dispose of the NM generator/storage site waste detailed in the ATWIR. The certification was provided to NMED on December 18, 2025.

Permit Part 4, Section 4.6.1.2, Reporting Requirements, requires an annual report in October evaluating the geomechanical monitoring program. The Permittees submitted the annual Geotechnical Analysis Report in October 2025, representing results for July 1, 2023, to June 30, 2024.

Permit Part 4, Section 4.6.2.1, Implementation of Repository VOC Monitoring, requires the Permittees to implement repository VOC monitoring and proficiency testing. On February 10, 2017, the NMED approved the Laboratory Proficiency

Testing Plan submitted on July 26, 2016. The Laboratory Proficiency Testing Plan (further described in Permit Attachment N, Section N-5e) focuses on results from an analytical laboratory that participates in low level VOC proficiency testing because the analytical laboratory is not accredited by accepted accreditation bodies. As described in Permit Attachment N, Section N-5e, the proficiency testing results will be reported in the Semi-Annual VOC Monitoring Report, however, the current contracted analytical laboratory, SGS North America Inc. (SGS), maintains accreditations required by the National Environmental Laboratory Accreditation Program, therefore, the requirement to report proficiency test results is no longer applicable.

Permit Part 4, Section 4.6.2.2, Reporting Requirements, requires semi-annual reports due in April and October describing the results (data and analysis) of the VOC Monitoring Plan for the previous semi-annual period. The Permittees submitted semi-annual VOC reports in April 2025, representing results for July 1, 2024, through December 31, 2024, and in October 2025, representing results for January 1, 2025, through June 30, 2025.

Permit Part 4, Section 4.6.4.2, Reporting Requirements, requires a report annually in October presenting the data results and analysis of the mine ventilation rate monitoring program. The Permittees submitted the annual report in October 2025, representing results for July 1, 2024, to June 30, 2025.

Permit Part 5, Section 5.10.2.1, Data Evaluation Results, requires a report annually by November 30 of the analytical results for the annual Detection Monitoring Program (DMP) well samples and duplicates, as well as results of the statistical analysis of the samples showing whether statistically significant evidence of contamination is present. The Annual Culebra Groundwater Report for sampling round 47 was submitted to the NMED in November 2025. Sampling results are also summarized in appendices E and F of this ASER.

Permit Part 5, Section 5.10.2.2, Groundwater Surface Elevation Results, requires semi-annual reports by May 31 and November 30. These reports were submitted to the NMED in May and November 2025. The November report was combined with the Annual Culebra Groundwater Report.

Permit Part 5, Section 5.10.2.3, Groundwater Flow Results, requires that groundwater flow data be included in the Annual Culebra Groundwater Report by November 30. The groundwater flow data were submitted in November 2025.

Permit Part 6, Section 6.7, Certificate of Closure, requires the Permittees to certify in writing to the Secretary within 60 calendar days of completion of closure of each underground HWDU, and within 60 calendar days of completion of final closure, that the underground HWDUs and/or facility have been closed. No underground HWDUs were closed during this reporting period.

Permit Part 6, Section 6.8, Survey Plat, requires submission of a survey plat detailing the location and dimensions of each HWDU with respect to permanently

surveyed benchmarks. No underground HWDUs were closed during this reporting period.

Pursuant to NMED's May 21, 2025, request, the Permittees submitted a revised Legacy TRU Waste Disposal Plan (LTWDP) to the NMED in November 2025. The LTWDP was developed in accordance with Permit Part 4, Section 4.2.1.5. The Plan defines legacy TRU and TRU mixed waste and discusses considerations related to reserving Panel 12 for legacy TRU mixed waste, to the extent practicable.

Permit Attachment A2, Section A2-5b(2)(a) requires submission of a list of oil and gas production and salt water disposal wells within a one-mile perimeter outside the Land Withdrawal Act boundary that were listed as active by the Oil Conservation Division during the previous calendar year. This report was provided on April 25, 2025.

2.3 NATIONAL ENVIRONMENTAL POLICY ACT

NEPA (42 U.S.C. § 4331, et seq.), as amended, requires Federal agencies to incorporate evaluation of environmental effects into agency planning and decision-making. Specifically, agencies are to prepare detailed statements assessing the environmental impact of, and alternatives to, major Federal actions that will have a significant impact on the human environment.

In 2025, two U.S. Supreme Court opinions fundamentally altered Federal NEPA implementation. Additionally, the White House Council on Environmental Quality (CEQ) revoked its own NEPA regulations in response to a Supreme Court decision, finding that CEQ lacks authority to issue regulations. A separate Supreme Court opinion curtailed the scope of analysis to only "reasonably foreseeable" impacts and accorded substantial discretion to Federal agencies in how they approach NEPA implementation. Accordingly, DOE revoked most of its own NEPA regulations and replaced them with non-regulatory, advisory procedures that emphasize the kinds of DOE activities to which NEPA does not apply. Remaining DOE NEPA regulations principally address categorical exclusions and emergency actions.

One Categorical Exclusion Determination was prepared for a transmission line crossing at WIPP in 2025. No Environmental Assessments or Environmental Impact Statements were prepared for WIPP in 2025.

2.4 CLEAN AIR ACT

The *Clean Air Act* (42 U.S.C. § 7401, et seq.) provides for air quality preservation, protection, and enhancement. Both the State of NM and the EPA have the authority to regulate compliance with portions of the *Clean Air Act*. Radiological effluent monitoring in compliance with EPA standards is discussed in chapter 4.

In 1993, a *New Mexico Air Quality Control* (NMSA 1978 §74-2) Regulation 702 Operating Permit (recodified in 2001 as 20.2.72 NMAC, “Construction Permits”) was obtained for two backup diesel generators at the WIPP facility. No activities or modifications to the operating conditions of the diesel generators occurred in the CY requiring reporting under the conditions of the Operating Permit.

The *Clean Air Act* established National Ambient Air Quality Standards (AAQS) for six criteria pollutants: sulfur oxides, particulate matter, carbon monoxide, ozone, nitrogen dioxide, and lead. The initial 1993 WIPP air emissions inventory was developed as a baseline document to calculate maximum potential hourly and annual emissions of hazardous and criteria pollutants. Based on the current air emissions inventory, WIPP facility operations do not exceed the 10 tons per year emission limit for any individual hazardous air pollutant, the 25 tons per year limit for any combination of hazardous air pollutant emissions, or the 10 tons per year emission limit for criteria pollutants except for total suspended particulate (TSP) matter and particulate matter less than 10 microns in diameter. Particulate matter is produced from fugitive sources related to managing salt tailings extracted from the underground produced by wind erosion of the piles and dust from haul roads. Consultation with the NMED Air Quality Bureau (AQB) resulted in a March 2006 determination that a permit is not required for fugitive emissions of particulate matter that result from mined rock management at the WIPP facility. In 2018, the New Mexico Environmental Improvement Board repealed the New Mexico AAQS for TSP. Proposed facility modifications are reviewed to determine if they will create new air emission sources and require permit applications.

On September 10, 2025, the WIPP facility received an exemption from permitting by the NMED –AQB for the operation of a 1,340-horsepower stand-by generator for Shaft 5. On October 2, 2025, the WIPP facility received an exemption from permitting by the NMED –AQB for the operation of a 1,141-horsepower stand by generator for Substation 6. The requirement for operation of these two generators is that they operate only during power outages, except for testing, and that the hours of operation be logged and not exceed a total of 500 hours per year.

2.5 CLEAN WATER ACT

The *Clean Water Act* (33 U.S.C. § 1251, et seq.) establishes provisions for the issuance of permits for discharges into waters of the United States (WOTUS). The regulation defining the scope of the permitting process is contained in 40 CFR § 122.1(b), “Scope of the NPDES Permit Requirement,” which states: “The National Pollutant Discharge Elimination System program requires permits for the discharge of ‘pollutants’ from any ‘point source’ into ‘waters’ of the United States.”

The WOTUS definition was revised on September 8, 2023, in response to the U.S. Supreme Court decision in the *Sackett v. EPA* case issued on May 25, 2023.

On November 17, 2025, EPA and the Department of the Army announced proposed revisions to the WOTUS definition https://www.epa.gov/system/files/documents/2025-11/ag_factsheet_wotus_nprm.pdf. Federal jurisdiction for WOTUS is focused on relatively permanent, standing or continuously flowing bodies of water, such as streams, river, and lakes, and wetlands that are connected and indistinguishable from such

waterbodies (see the 2025 Proposed WOTUS Rule Fact Sheet at [2025 Proposed WOTUS Rule Fact Sheet](#)).

The WIPP facility is located in an area devoid of WOTUS. Wastewaters currently generated at the WIPP facility include:

- stormwater runoff from paved areas and building roofs within the PPA (Property Protected Area) that discharge to three synthetically-lined storm water impoundments (Storm Water Ponds or SWPs)
- stormwater runoff from salt piles that receive mined out-material from underground operations (known as Salt Cells) that also discharge to three synthetically-lined evaporative impoundments (known as Salt Storage Ponds or SSPs)
- non-hazardous industrial wastewaters transported for disposal in a synthetically-lined evaporative impoundment H-19
- sanitary wastewater discharged from the sewer system to the synthetically-lined the Facultative Lagoon System (FLS) consisting of two settling lagoons, two polishing lagoons, and three effluent lagoons.

The management of the above wastewaters and stormwaters is regulated under the *New Mexico Water Quality Act* (NMSA 1978, §74-6-1, et seq.), as discussed in section 2.6.

2.6 NEW MEXICO WATER QUALITY ACT

The *New Mexico Water Quality Act* created the New Mexico Water Quality Control Commission, tasked with developing regulations to protect NM ground and surface water. New Mexico water quality regulations for ground and surface water protection are contained in 20.6.2 NMAC, “Ground and Surface Water Protection.” The WIPP facility does not discharge to surface water but does have a discharge permit (DP) designed to prevent impacts to groundwater.

The NMED Groundwater Quality Bureau (GWQB) issued the current DP-831 permit on January 28, 2022 with conditions designed to control the discharge of water contaminants from WIPP in order to protect groundwater and those segments of surface water gaining from groundwater inflow for present and potential future use as domestic and agricultural water supply and other uses, and to protect public health. The complete DP-831 permit can be viewed at [https://www.wipp.energy.gov/library/OtherDocuments/2022-01-28-WPD_GWQB_DP-831_SignedDP\(Final\).pdf](https://www.wipp.energy.gov/library/OtherDocuments/2022-01-28-WPD_GWQB_DP-831_SignedDP(Final).pdf).

The DP-831 permit requires WIPP to conduct a variety of field activities to monitor wastewater discharges to the fourteen wastewater lagoons and impoundments described in Section 2.5. It also requires WIPP to monitor salt piles or salt cells next to the evaporative impoundments, the Site Preliminary Design Validation (SPDV) pile, and monitor 23 groundwater monitoring wells installed at various WIPP locations. Monitoring activities required under the DP-831 permit include:

- Measuring and calculating wastewater discharges to the FLS and H-19
- Measure water depths and calculate water volumes discharged to SWPs and SSPs
- Conducting monthly inspections and inspections after 2-inch storm events at Salt Cell 1 and the SPDV pile
- Maintaining and operating Leak Detection, Collection and Recovery Systems at SSPs 2, 3, and 5
- Collect composite wastewater samples from specified FLS Lagoons and H-19
- Collect composite wastewater samples from SSPs 1 – 3 after 2-inch storm events
- Measure depth to groundwater in the monitoring wells
- Collect semiannual groundwater samples from the monitoring wells

The above activities are some of the monitoring conditions specified in the DP-831 permit. All other Terms and Conditions (T&Cs) can be reviewed by accessing the current DP-831 linked at [https://www.wipp.energy.gov/library/OtherDocuments/2022-01-28-WPD_GWQB_DP-831_SignedDP\(Final\).pdf](https://www.wipp.energy.gov/library/OtherDocuments/2022-01-28-WPD_GWQB_DP-831_SignedDP(Final).pdf).

NMED received notifications of the following changes to DP-831 permit regulated facilities in 2025 from CBFO:

- Brine SSP 4 became operational in July after the installation of a Leak Detection, Collection and Recovery System. This SSP receives some stormwater runoff but does not receive brine water yet since the Salt Reduction Building has yet to be commissioned.
- Replacement of the SSP 2 and SSP 3 liners (figure 2.1) began on August 10, 2025. The liner installations are scheduled for completion in early 2026.
- The SPDV Pile liner and cover replacement project also began on August 10, 2025.



Figure 2.1 – SSP 2 Liner Replacement

On February 4, 2025, WIPP discovered a sewage discharge through a manhole cover in the line leading to Settling Lagoon 2 at the FLS. After a discharge of approximately 10,000 gallons, the obstruction in the line was removed and sewage flow was restored on February 5, 2025. WIPP provided a verbal report to the NMED GWQB within 24 hours of the unauthorized discharge, and a written report on the discharge along with a Corrective Action Plan (CAP) on February 11, 2025, within the one week requirement in T&C 70 of the permit. The GWQB approved the CAP on March 4, 2025.

The DP requires semi-annual reports to be submitted to the NMED by the first of February and August. The reports included permit-required inspection results, water analyses, and sewage and stormwater discharge volumes. Both semi-annual reports were submitted, one in July 2025 for the reporting period of January 1, to June 30, 2025, and the other in January 2026, for the reporting period of July 1, to December 31, 2025. The Semi-Annual Reports show that WIPP complied with all Terms and Conditions for the wastewater impoundments and SPDV Pile in 2025. Groundwater monitoring and reporting requirements in the DP-831 permit are discussed in Section 4.7. Liquid effluent monitoring results for samples collected from the WIPP evaporative ponds and lagoons are presented in Section 5.7.

There were no inspections at the WIPP facility in 2025 by the NMED, Ground Water Quality Bureau.

2.7 SAFE DRINKING WATER ACT

The *Safe Drinking Water Act* (42 U.S.C. § 300f, et seq.) provides the regulatory strategy for protecting public water supply systems and underground drinking water sources. New Mexico's drinking water regulations are contained in 20.7.10 NMAC, "Drinking Water," which adopts, by reference, 40 CFR Part 141, "National Primary Drinking Water Regulations," and 40 CFR Part 143, Subpart A, "National Secondary Drinking Water

Regulations.” Water is supplied to the WIPP facility by the city of Carlsbad, NM. The WIPP facility’s water system (NM3598008) is classified as a non-transient, non-community water system subject to NM drinking water regulations.

Bacterial and residual chlorine levels are tested on a monthly and biweekly basis, respectively. Free chlorine levels reported to the NMED twice each month showed that the disinfectant level was below the maximum residual disinfectant level for chlorine in the National Primary Drinking Water Regulations (NPDWR). Bacteriological analytical results for total coliforms and E. Coli showed no detections in the WIPP water system.

Facilities personnel conduct disinfectant byproducts testing per 40 CFR § 141.132, “Monitoring Requirements,” annually. The results are reported in the Waste Isolation Pilot Plant Annual Disinfectant Byproducts (DBP) Compliance Sampling for 2025 Report. In September 2025, DBP samples were collected at two locations from the WIPP water system. Results in both samples were below the Maximum Contaminant Levels (MCLs) for trihalomethanes and haloacetic acids.

The WIPP Water System must be sampled for lead and copper triennially within the distribution system in accordance with 40 CFR Part 141 Subpart I, “Control of Lead and Copper.”

In April 2024, EPA promulgated NPDWR for per- and polyfluoroalkyl substances (PFAS) that established an initial monitoring period for public water systems beginning in 2026. The initial PFAS sampling for WIPP will begin in May of 2026.

2.8 NATIONAL HISTORIC PRESERVATION ACT

The *National Historic Preservation Act*, as amended (54 U.S.C. § 300101, et seq.; formerly 16 U.S.C. § 470, et seq.), was enacted to protect the nation’s cultural resources in conjunction with the states, local governments, Indian tribes, and private organizations and individuals. The act also established the National Register of Historic Places. The actual regulations are found in 36 CFR Part 800. The State Historic Preservation Officer coordinates the State of New Mexico’s participation in implementing the *National Historic Preservation Act*. Protection and management of cultural resources at and around the WIPP facility is implemented per DOE Policy 141.1 and through the WIPP LMP, the land use request (LUR), and the Environmental Compliance Review (see section 5.2). Planning/management policies pertaining to cultural resources within the WLWA are conducted in accordance with regulations and guidelines included in appendix F, *Implementing Regulations Regarding Cultural Resources*, of the LMP. The objectives of the policies are to protect and preserve the full array of cultural resources within the WLWA for the benefit of scientific and socio-cultural use by present and future generations.

To protect cultural resources, projects proposed on previously undisturbed areas require the submittal of an LUR. For WIPP-related projects, an Environmental Compliance Review form is also required. These documents are reviewed by personnel cognizant of regulatory requirements. They are used to determine if air, water, hazardous waste, or land use permits are required for the activity as well as documenting potential impacts to wildlife, vegetation, and cultural resources. Projects

that could potentially impact cultural sites may require additional surveys to minimize any impacts. No cultural surveys were completed during this CY. Two LURs were processed in the CY and reviewed to ensure protection of cultural resources.

2.9 TOXIC SUBSTANCES CONTROL ACT

The *Toxic Substances Control Act* (15 U.S.C. § 2601, et seq.) regulates the production, use, distribution, and disposal of new, potentially toxic chemical substances including asbestos and PCBs.

Because of the potential for serious health hazards associated with asbestos, Congress amended the Toxic Substances Control Act in 1986 by adding Title II, the Asbestos Hazard Emergency Response Act, to regulate asbestos-containing materials in schools. A survey of the buildings at the WIPP facility determined that there are no asbestos-containing materials in any of the structures.

The PCB storage and disposal regulations are listed in the applicable subparts of 40 CFR Part 761, "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions." On May 15, 2003, EPA Region VI approved the disposal of transuranic waste containing PCBs at the WIPP facility. The WIPP facility began receiving PCB-contaminated waste on February 5, 2005. The EPA renewed the disposal authority for five years on April 30, 2008, May 21, 2013, and March 19, 2018. On July 20, 2022, a letter requesting re-authorization was sent to the EPA Region IV. The EPA provided an extension through September 30, 2023. The EPA extended the previous approval through April 15, 2024. On April 11, 2024, the EPA issued Conditions of Approval granting reauthorization for the disposal of non-liquid PCBs contaminated with transuranic waste (PCB/TRU) and PCB/TRU waste mixed with hazardous waste. The reauthorization was effective on April 11, 2024, and is effective for five years. The required PCB annual report, containing information on PCB waste received and disposed of at the WIPP facility during 2025, was submitted to EPA Region VI in accordance with 40 CFR Part 761 on July 9, 2026.

2.10 FEDERAL INSECTICIDE, FUNGICIDE, AND RODENTICIDE ACT

The *Federal Insecticide, Fungicide, and Rodenticide Act* (7 U.S.C. § 136, et seq.) authorizes the EPA to regulate the registration, certification, use, storage, disposal, transportation, and recall of pesticides (40 CFR Parts 150 to 189, "Federal Insecticide, Fungicide, and Rodenticide Act Regulations").

The Pesticide Control Act (NMSA 1978, §§ 76-4-1 through 76-4-39) is administered and enforced by the New Mexico Department of Agriculture (NMDA). This act provides for the registration, labeling, distribution, storage, transportation, application, use, and disposal of pesticides and pesticide-related devices in order to protect the environment and the public health and welfare. It provides for the licensing of pesticide dealers, consultants, applicators, and operators of pesticide apparatus and allows for penalties for noncompliance with requirements. The New Mexico Pesticide Control Act is implemented through 21.17.50 NMAC pesticide rules. The regulations establish requirements for licensing and for applying pesticides in New Mexico.

Licensed, certified applicators are contracted to apply pesticides at the WIPP facilities and are required to produce proof of licensing as part of the procurement process. The MOC contractor reviews the pesticides to be applied by the subcontractor before their application to ensure that products proposed for use are registered with NMDA.

Applicators routinely spray herbicides to control mesquite and other plant species on the 16 sections of the WLWA, including within the PPA, around evaporation ponds, salt storage cells, and SPDV salt tailings pile. General-use pesticides are stored according to label instructions. The mixing of pesticides must be performed outside of WIPP at the subcontractor's location. After the completion of work activity pesticide products transported to WIPP must be removed offsite. No storage of unused pest application materials, products or application equipment is allowed at WIPP.

2.11 ENDANGERED SPECIES ACT

The *Endangered Species Act of 1973*, as amended (16 U.S.C. § 1531 et seq.), was enacted to prevent the extinction of imperiled species. This act provides strong measures to help alleviate the loss of species and their habitats. It places restrictions on activities that may affect endangered and threatened species to help ensure their continued survival. With limited exceptions, the act prohibits activities that could potentially impact protected species unless permitted by the U.S. Fish and Wildlife Service (FWS). A biological assessment and formal consultation, followed by the issuance of a biological opinion by the FWS, may be required for any species determined to be in potential jeopardy. The intent of the Congressional endangered species legislation is further advanced in the New Mexico *Wildlife Conservation Act* (NMSA 1978, § 17-2-37, et seq.), enacted in 1978 to protect the state's threatened and endangered wildlife.

During the CY, no imperiled species protected by the *Endangered Species Act* or New Mexico *Wildlife Conservation Act* were identified as occurring within the WLWA. However, considerations pertaining to protected species are implemented in accordance with the LMP (see section 5.2) during the deliberation and administration of projects conducted on WIPP lands. In the CY, no permits, biological assessments, or formal consultations were required. Additional details on wildlife population monitoring are presented in section 5.2.2 and the LMP.

2.12 MIGRATORY BIRD TREATY ACT

The *Migratory Bird Treaty Act* (16 U.S.C. § 703 et seq.) is intended to protect birds with common migratory flyways between the United States, Canada, Mexico, Japan, and Russia. The act makes it unlawful "at any time, by any means or in any manner, to pursue, hunt, take, capture, kill, or attempt to take, capture, or kill any migratory bird, any part, nest, or eggs of any such bird" unless specifically authorized by the Secretary of the Interior by direction or through regulations permitting and governing actions (50 CFR Part 20, "Migratory Bird Hunting"). Hunting allowances within the WLWA continued except for the areas that are posted against trespass. Migratory bird hunting in areas open to hunting is governed by federal and state regulations.

In a notice published in 78 Federal Register 62041, the DOE informed the public of the availability of its Memorandum of Understanding (MOU) with the FWS regarding the implementation of Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds. The Executive order was published in 66 Federal Register 3853. This MOU expired in 2018, but the DOE signed an addendum to extend the MOU past this date. The MOU and the Executive order commit DOE to take specific actions to implement the Migratory Bird Treaty Act.

The DOE has implemented management objectives to protect birds and their habitats in the WIPP LMP. During the bird-nesting season, routine inspections of equipment at the WIPP are performed to monitor for early signs of nest building in critical areas and on critical equipment. When established nests are discovered, subsequent mitigative actions depend on specific species, situations, state and federal regulations, and authorizations and conditions of the FWS relocation permit. All requests for the use of WIPP lands outside the WIPP PPA are contingent on environmental walk-downs and confirming that nesting birds (including ground-nesting species) do not occupy the requested land. When nests are found, projects may be delayed or paused, or measures (e.g., buffer zones) are implemented to minimize impact.

The MOC, under the purview of the DOE, was granted an FWS relocation permit which allows for conditional relocation of nests, eggs, and or fledglings of migratory birds if located in a critical area that will impact their safety. Relocation was not needed during the CY. The required annual report form for the CY was submitted to FWS on January 12, 2026.

2.13 FEDERAL LAND POLICY AND MANAGEMENT ACT

The objective of the *Federal Land Policy and Management Act of 1976*, as amended (43 U.S.C. Chapter 35 § 1701, et seq.), is to ensure that,

...public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use.

Title II under the act, *Land Use Planning; Land Acquisition and Disposition*, directs the Secretary of the Interior to prepare and maintain an inventory of public lands and to develop and maintain, with public involvement, land use plans regardless of whether subject public lands have been classified as withdrawn, set aside, or otherwise designated for one or more uses, which is described in further detail in section 5.2.

Under Title V, *Rights-of-Way*, the Secretary of the Interior is authorized to grant, issue, or renew rights-of-way over, upon, under, or through public lands. To date, numerous right-of-way reservations and land-use permits have been granted. Appendix B1 of Permit Attachment B includes a list of active right-of-way permits. Each facility (road, well pads, and rail spur) is maintained and operated in accordance with the stipulations

provided in the respective right-of-way reservation. Areas that are the subject of a right-of-way reservation are reclaimed and revegetated in a manner consistent with the terms of the right-of-way when they are no longer needed.

For the CY, no reclamations were completed for rights-of-way granted as per this act.

2.14 ATOMIC ENERGY ACT

The *Atomic Energy Act of 1954*, as amended (42 U.S.C. §2011, et seq.), initiated a national program with responsibility for the development and production of nuclear weapons and a civilian program for the development and the regulation of civilian uses of nuclear materials and facilities in the United States. Amendments to the act split these functions between the DOE, which is responsible for developing and producing nuclear weapons, promoting nuclear power, and other energy-related work, and the U.S. Nuclear Regulatory Commission, which regulates the use of nuclear energy for domestic civilian purposes.

The statutory authority for the EPA to establish and generate applicable environmental radiation protection standards for the management and disposal of spent nuclear fuel, high-level waste, and TRU radioactive waste is found in the *Atomic Energy Act of 1954*, Reorganization Plan Number 3 of 1970, and in the *Nuclear Waste Policy Act of 1982* (42 U.S.C. §10101, et seq.). The EPA final rule, 40 CFR Part 191, "Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes," was promulgated on December 20, 1993 (effective January 19, 1994) and consists of three subparts: Subpart A, "Environmental Standards for Management and Storage," Subpart B, "Environmental Standards for Disposal," and Subpart C, "Environmental Standards for Ground-Water Protection."

The results of both environmental and effluent monitoring and dose calculations have indicated that there have been no releases of radionuclides from the WIPP facility that may adversely impact the public. Results of the monitoring program demonstrate compliance with the dose limits specified in 40 CFR Part 191, Subpart A, and 40 CFR § 61.92, which are discussed in further detail in chapter 4. Facility personnel have conducted confirmatory effluent monitoring since receipt of waste began in March 1999.

The WIPP LWA established the U.S. Environmental Protection Agency (EPA) as the primary regulatory authority for evaluating the long-term performance of the repository for the disposal of transuranic (TRU) waste. In 1993, the EPA promulgated the disposal standards in Title 40 Code of Federal Regulations (CFR) Part 191, Subparts B and C. The EPA subsequently promulgated the implementation criteria in 40 CFR Part 194 (Criteria for the Certification and Recertification of the Waste Isolation Pilot Plant's Compliance with the 40 CFR Part 191 Disposal Regulations).

DOE submitted the original Compliance Certification Application (CCA) in October 1996, and the EPA certified the facility in May 1998. The LWA mandates that the EPA recertify WIPP's continued compliance every five years following the initial receipt of TRU waste (March 1999) until the end of the decommissioning phase. DOE successfully completed

recertifications in 2004, 2009, 2014, and 2019 (CRA-2019 recertified in May 2022; 87 FR 26126).

In May 2023, DOE proposed that future CRA five-year submission cycles be calculated from the publication date of the EPA's most recent CRA completeness determination in the Federal Register, rather than the static March 1999 initial waste receipt date. The EPA formally concurred with this approach on August 10, 2023. Under the previous fixed cadence, the fifth CRA would have been due in March 2024. By establishing the deadline as five years following the Federal Register notice of the CRA-2019 completeness determination (published November 26, 2021), the EPA revised the submission deadline for the next CRA to on or before November 26, 2026. DOE initiated development of CRA-2026 in January 2025 and will submit the application to the EPA in November 2026.

2.15 EPA ECHO DATABASE, LIST OF FACILITIES FOR WIPP

The EPA Enforcement and Compliance History Online (ECHO) database, (echo.epa.gov) first launched in 2002, is a public website that provides compliance information (data, monitoring history, compliance status, etc.) about permitted, regulated facilities. The WIPP site has 10 listings for the CY with information as follows:

1. **USDOE Waste Isolation Pilot Plant – Clean Air Act (CAA):** Operating Minor (NM0000003501500194), *Resource Conservation and Recovery Act* (RCRA): Active LQG, Operating TSDF (NM4890139088), Toxic Release Inventory (TRI): 88220SDWST3MILE, Facility Register Service (FRS) ID: 110060818735, there is one Hazardous Waste violation type is 279.c – Standards for Used Oil: Generators, citation is 279.22(c)(1) Containers and Aboveground storage tanks must be clearly marked used oil.
2. **USDOE Waste Isolation Pilot Plant – FRS ID:** 110070753598
3. **USDOE Waste Isolation Pilot Plant – Clean Water Act (CWA):** Non-Major, (NMU001557), Non-Major, Permit Not Needed (NMR05A823), FRS ID: 110032592031
4. **USDOE Waste Isolation Pilot Plant – Integrated Compliance Information System (ICIS):** 600033624
5. **Waste Isolation Pilot Plant – FRS ID:** 110012516722
6. **Waste Isolation Pilot Plant – FRS ID:** 110022722035
7. **WIPP Safety Significant Confinement Ventilation System – Clean Water Act (CWA):** Non-Major, Permit Expired, (NMR1001Y9), FRS ID:110070528602, no violations identified.
8. **USI – Clean Water Act (CWA):** Non-Major, Permit Expired, (NMR100207), FRS ID:110070530291, no violations identified.

9. **WIPP North Access Road Bypass** – *Clean Water Act* (CWA): Non-Major, Permit Expired, (NMR1001WV), FRS ID:110070519468, no violations identified.
10. **WIPP Water Supply** – *Safe Drinking Water Act* (SWDA) WNER: Federal government, PRIMARY SERVICE AREA DESCRIPTION: Industrial/Agricultural, SOURCE: Ground water purchased, TYPE: Non-Transient non-community system Permit Active (NM3598008), FRS ID: 110050946134, no violations identified.

3.0 ENVIRONMENTAL MANAGEMENT SYSTEM

The WIPP EMS is implemented as a function of the Integrated Safety Management System (ISMS), and is based on the Plan-Do-Check-Act framework in the ISO 14001:2015 standard. The last ISO 14001 triennial recertification audit was conducted in May 2024 by Advanced Waste Management Systems (AWMS). AWMS found the WIPP EMS to be adequate and effective in ensuring that Environmental Policy is being implemented.

The defined scope of the WIPP EMS applies to environmental aspects of the WIPP Project. The continual improvement of WIPP's EMS and environmental performance continues to be managed, monitored, and evaluated by the Environmental Management System Steering Committee (EMSSC) to document leadership commitment.

3.1 ENVIRONMENTAL MANAGEMENT SYSTEM HIGHLIGHTS

WIPP established an Environmental Objective (EO) in 2025 to minimize waste and consumption of resources and increase recycling efforts. A management assessment was conducted by the SEC to identify and eliminate the use of fluorescent lights in the WIPP underground. Results of this effort are summarized in Table 3.1.

Table 3.1 – Management Assessment of Fluorescent Lamps in the Underground

Major Issues Identified	Status/Corrective Actions
Assess underground (UG) lighting	Engineering verified that UG lighting in the drifts had already been upgraded by replacing nearly 80 fluorescent fixtures.
Identify locations with fluorescent lighting	Site Environmental Compliance (SEC) staff identified that UG connex trailers have fluorescent fixtures.
Replace/upgrade UG lighting to reduce generation of Universal Wastes	• Engineering and Maintenance organizations recommended submittal of Action Requests (ARs) for removal and replacement of remaining fluorescent lights and fixtures in the UG. • SEC submitted nine ARs for this.
Confirm proper containerization, disposal and tracking of replaced fluorescent bulbs	SEC verified correct handling and removal of the Universal Waste fluorescent lamps by the UG Tool Crib Attendant and UG Maintenance.

Source: Assessment Report WIPP-ASMT-25-0003, 6/9/25.

EMS highlights and accomplishments:

- Goals for EO 1:
 - Dispose of 100 percent of excess, unusable electronics through government programs and certified recyclers. The WIPP site generated 39.81 metric tons of electronics to be disposed of in FY 2025, and 100 percent were either recycled through the Federal Prison Industries program (operating under the trade name UNICOR), a certified electronics recycler or donated to the local community.
 - Site Environmental Compliance (SEC) directed WIPP Maintenance staff to transfer off-specification and expired oil products, used oil and antifreeze from small buckets into 55-gallon drums and 275-gallon capacity bulk totes in preparation for offsite shipment and recycling. These materials had been accumulating in the Oil Shed for many years and needed to be cleared out to provide space for current inventories of these materials.
 - Additional recycling stations were established in Carlsbad at Skeen Whitlock Building, WIPP Training Center, WIPP Labs and the Remote Handling Building, at WIPP Training and Support Buildings, and at Trailer 925 in the Underground Ventilation System (UVS) area.
 - Implement and actively use power management features on 100 percent of eligible computers (personal computers and laptops) and monitors. The WIPP site owns just under 4,347 computer monitors and central processing units as of 2024, all of which actively use power management features.
 - In 2025 SEC analyses determined that WIPP's investment in the Pollution Prevention and recycling programs of approximately \$263,000 resulted in a cost avoidance for waste disposal of approximately \$1.25 million, which is almost a 5:1 payback ratio.
 - Electronics Acquisition: 100 percent of eligible electronics procurements must be environmentally sustainable (e.g., Electronic Product Environmental Assessment Tool [EPEAT]). During FY 2025, 100 percent of eligible electronics procurements were Energy Star in addition to many being EPEAT-registered.

3.2 ENVIRONMENTAL PERFORMANCE MEASUREMENT

WIPP's strategic acquisition, and electronics stewardship efforts are summarized in this section.

3.2.4 Strategic Acquisitions

The DOE requires the inclusion of strategic contract language and inclusive clauses in site-generated service and construction contracts. This requirement communicates the expectation specific to purchasing and using sustainable products, goods, and services.

The emphasis on sustainability in procurement standards was started during FY 2017 by requiring recycled content, and incorporating Energy Star, Federal Energy Management Program, EPEAT, Significant New Alternatives Policy (SNAP) and Safer Choice labeling, WaterSense, and BioBased/BioPreferred content as requirements to be followed in a Sustainable Procurement Plan. This plan also requires use of SmartWay logistic providers. SNAP and Safer Choice products that mandate low to zero VOC products and zero tolerance for products containing ozone-depleting substances (ODSs).

In addition, the project expanded the inclusion of these preferred strategic acquisition requirements into scopes of work, purchase orders, service contracts, and construction projects contract language. This process helps ensure that most purchases contain requirements to implement sustainable procurement standards. In 2025, these strategic acquisition clauses were included in 56 subcontracts valued at \$20,080,138, which was approximately 50% of eligible WIPP subcontracts for the year.

3.2.5 Electronics Stewardship

The MOC applies sustainable lifecycle management by requiring applicable products, goods, and services to meet strategic acquisition expectations that are also embedded in the WIPP Electronic Management Policy (DOE/WIPP 11-3474, 2025; available on WIPP Home Page). The policy requires products to meet the highest EPEAT rating possible. The policy prescribes the use of default power management settings and the default duplex print management settings, and the use of paper with 30 percent recycled content copy paper.

The policy requires the disposition of surplus electronics to be conducted in a manner that meets federal expectations.

In FY 2025, the WIPP collected 39.81 metric tons of surplus electronics and electronics needing disposal. This represented 155 computers, 125 monitors, and 10 printers. UNICOR processed 1.4 tons of e-waste from WIPP.

Electronics at WIPP are purchased with Sustainable Acquisition requirements primarily met through EPEAT. The purchase of EPEAT-registered electronic products by WIPP in FY 2025 generated \$49,135 in cost savings.

3.3 EMS CHALLENGES & BARRIERS

An external audit was cancelled and certification to ISO 14001 was removed. Staff retention also plays a crucial challenge to the WIPP EMS program and maintaining dedicated staff for the EMS remains a great opportunity for WIPP. Staff inside the EMS program have included an EMS Coordinator and a Pollution Prevention Coordinator. Additionally, while challenging, pulling together interdepartmental personnel for a committee to prioritize the EMS are challenged by lack of MOC participation and leadership, and lagging commitment to continuous improvement.

A new EMS Coordinator began work at WIPP on September 14. SIMCO plans to have the previous EMS Coordinator work with the new one to develop a resolution plan and re-start the EMS program in FY2027.

4.0 ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM INFORMATION

The purpose of Department of Energy Order 458.1, Chg. 5 is to establish requirements to protect the public and the environment against undue risk from radiation associated with radiological activities conducted under the control of the DOE pursuant to the *Atomic Energy Act of 1954*, as amended. The objectives of this Order are:

- To conduct DOE radiological activities so that exposure to members of the public is maintained within the dose limits established in this Order.
- To control the radiological clearance of DOE real and personal property.
- To ensure that potential radiation exposures to members of the public are as low as is reasonably achievable.
- To ensure that DOE sites have the capabilities, consistent with the types of radiological activities conducted, to monitor routine and non-routine radiological releases and to assess the radiation dose to members of the public.
- To provide protection of the environment from the effects of radiation and radioactive material.

Radionuclides present in the environment, whether naturally occurring or human-made, may result in radiation doses to humans. Therefore, environmental monitoring around nuclear facilities is imperative to characterize radiological baseline conditions, identify any releases, and determine the effects of releases should they occur.

Personnel at the WIPP facility sample effluent and ambient air, groundwater, surface water, soils, sediments, and biota to monitor the radiological environment around the facility. This monitoring is carried out in accordance with the *Waste Isolation Pilot Plant Environmental Monitoring Plan*. The radiological effluent monitoring portion of this plan meets the requirements contained in DOE/HDBK-1216-2015, *Environmental Radiological Effluent Monitoring and Environmental Surveillance*.

The environmental standards for the WIPP facility are established in 40 CFR Part 191, Subpart A, "Environmental Standards for Management and Storage." The DOE must comply with environmental radiation protection standards in 40 CFR § 191.03, Subpart A, which applies to the management and storage of radioactive waste. The limits in 40 CFR § 191.03(b) state that the combined annual dose equivalent to any member of the public in the general environment resulting from discharges of radioactive material and direct radiation from such management and storage shall not exceed 25 mrem (0.25 mSv) to the whole body and 75 mrem (0.75 mSv) to any critical organ. In a 1995 MOU, between the EPA and the DOE, the DOE agreed that the WIPP facility would comply with 40 CFR Part 61, NESHAP, Subpart H, "National Emission Standards for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities." The NESHAP limit (40 CFR § 61.92) states that the emissions of radionuclides to the ambient air from DOE facilities shall not exceed those amounts that would cause any member of the public to receive in any year an EDE of 10 mrem (0.1 mSv).

The *Statistical Summary of the Radiological Baseline for the Waste Isolation Pilot Plant* (DOE/WIPP-92-037) summarizes the radiological baseline data obtained at and near the WIPP site. The baseline was established from 1985 through 1989, prior to the time that the WIPP facility became operational. Radioisotope concentrations in environmental media sampled under the current ongoing monitoring program are compared with this baseline to gain information regarding annual fluctuations.

The locations sampled in this initial study were similar, or identical, to the locations sampled as a part of the Environmental Monitoring Program. On-site air samples were collected at the WIPP East, WIPP South, WIPP Farfield, and WIPP Northwest location. Off-site air samples were collected in Carlsbad, Smith Ranch, Mills Ranch, and Eunice, NM. Soil samples were collected at depths of 0 to 2 cm, 2 to 5 cm, and 5 to 10 cm. On site soil samples were collected at eight locations at the cardinal compass directions from the center of the WIPP facility along the boundary fencing. Off-site, a further 15 samples were collected along the Five-Mile Ring, centered around the WIPP facility. Further samples were collected to represent a variety of habitats- Artesia, NM, Jal, NM, the Gnome Site, a potash mine, an oil production site, etc. Surface water samples were collected from stock tanks, three in the Los Medanos area and two from the Nash Draw, and four further sampling locations were located at points along the Pecos River. A third surface water sample group were from a series of playa lakes at the southwestern end of the Nash Draw. For groundwater samples, 23 water monitoring wells in the Culebra unit of the Rustler formation were sampled, along with four in the Magenta unit, and 10 privately-owned wells. Sediment samples were collected in conjunction with the surface water sampling- stock tanks included the Hill Tank, Indian Tank, Noye Tank, two sites along the Pecos River, and the playa lakes at the southwestern end of Nash Draw. The specific sites for biota sampling were not detailed.

The media sampled as part of the Environmental Monitoring Program included airborne particulates, soil, surface water, groundwater, sediments, and biota (vegetation and animals). These samples are analyzed for uranium ($^{233/234}\text{U}$, ^{235}U , ^{238}U), potassium (^{40}K), plutonium (^{238}Pu , $^{239/240}\text{Pu}$), americium (^{241}Am), cesium (^{137}Cs), cobalt (^{60}Co), and strontium (^{90}Sr) for a total of 10 individual or combined (not analytically separated) target radionuclides/radioisotopes monitored. Since the isotopes of uranium (^{238}U , ^{235}U , and ^{234}U) and potassium (^{40}K) are naturally occurring and not a result of WIPP operations, the data is presented in appendix F for completeness. The americium and plutonium isotopes make up the majority of radionuclide quantity placed into storage at WIPP (> 99 percent based on the Annual Transuranic Waste Inventory Report of the TRU actinides expected to be present in the waste). Cesium and strontium radionuclides are major fission products, thus potentially a component of the waste. The cobalt radionuclide is an activation product of reactor structural materials. Environmental levels of these radionuclides could provide corroborating information on which to base conclusions regarding releases from WIPP facility operations. Of the 10 radionuclides, ^{40}K , ^{137}Cs , and ^{60}Co are gamma emitters, ^{90}Sr is a beta emitter, and the remainder are alpha emitters.

Radionuclides are considered detected in an environmental sample if the measured concentration or activity is greater than the total propagated uncertainty (TPU) at the 2 sigma (σ) level, and greater than the minimum detectable concentration (MDC). The

MDC is determined based upon the natural background radiation, the analytical technique, and the inherent characteristics of the analytical equipment as determined by the analytical laboratory. The MDC represents the minimum radionuclide concentration detectable in a given environmental sample using the given equipment and techniques with a specific statistical confidence (usually 95 percent). The TPU is an estimate of the uncertainty in the measurement due to all sources, including counting error, measurement error, chemical recovery error, detector efficiency, randomness of radioactive decay, and any other sources.

The radioisotope in the sample is decaying as it is being measured, so no finite value can be assigned. However, the actual amount of radioactivity can be reasonably assumed to be within the range of the TPU, that is, it is statistically highly improbable to fall outside of that range. Analytical results are also normalized with the instrument background and/or the method blank. If either of those measurements has greater activity ranges than the actual sample, it is possible to get negative values on one end of the reported range of activities. Results are often reported in scientific notation. Additional information on scientific notation and the equations used is provided in appendix C.

WIPP Laboratories and GEL Laboratories analyzed the 10 target radionuclides in environmental radiological samples. Highly sensitive radiochemical analysis and detection techniques were used resulting in very low detection limits. This allowed the detection of radionuclides at concentration levels far below those of environmental and human health concerns.

Comparisons of radionuclide concentrations in environmental samples were made to the radiological baseline data obtained at and near the WIPP site from 1985 through 1989, before the WIPP facility became operational. These values are useful for comparison only and are not regulatory requirements. The isotopes for time series plots presented in this ASER were picked based on likely detection in the matrix in accordance with historical results and chances of detecting them in the matrix.

The air monitoring for radionuclides is divided between two programs: the WIPP facility Effluent Monitoring Program and the Environmental Monitoring Program. The following sections describe these two programs.

Effluent Monitoring Program

During 2025, there were three airborne effluent monitoring stations in use at the WIPP facility for characterizing radioactive particulate effluent: Stations B, C, and G. Each station employs one or more air samplers, collecting particulates from the effluent air stream using an acrylic copolymer membrane filter. Fixed air samplers at Station B and G collect samples from the underground exhaust air after high-efficiency particulate air (HEPA) filtration. Fixed air samplers at Station C collect samples from the exhaust air from the WHB after HEPA filtration. For the CY, Station B was operated until July 11 and Station G sampled the underground from July 12 until the end of the CY.

Stations B, C, and G are categorized as Potential Impact Category (PIC) 3 sources, requiring periodic confirmatory sampling and off-line analysis to confirm air emissions to

be at or less than a 0.01 potential fraction of the allowable dose limit in accordance with American National Standards Institute Health Physics Society (ANSI/HPS) N13.1-1999, *Sampling and Monitoring Releases of Airborne Radioactive Substances from the Stacks and Ducts of Nuclear Facilities*.

The supplemental ventilation system (SVS) was operated during this reporting period until March 18, 2025. The SVS consists of an auxiliary fan installed in the S-90 drift in the underground repository to provide additional ventilation air to the underground. Use of the SVS minimizes dust particulate loading on the underground ventilation system HEPA filtration units since the airflow directed to the construction (active mining) areas comes from the additional clean surface air. A portion of the salt-dust-laden air is exhausted up the Salt Handling Shaft (SHS). Ventilation air through the disposal area will continue to be routed through the Exhaust Shaft (i.e., Stations G). The SHS exhaust point is classified as a PIC 4, requiring an annual administrative review of facility uses to confirm the absence of radioactive materials in forms and quantities not conforming to prescribed specifications and limits, confirming air emissions to be at or less than a 0.0001 potential fraction of the allowable dose limit, in accordance with ANSI/HPS N13.1-1999.

For each sampling event, chain-of-custody forms are initiated to track and maintain an accurate written record of filter sample handling and treatment from the time of sample collection through laboratory procedures to disposal. During the CY, filter samples from the effluent air monitoring stations were analyzed for ^{238}Pu , $^{239/240}\text{Pu}$, ^{241}Am , ^{90}Sr , ^{137}Cs , $^{233/234}\text{U}$, and ^{238}U .

Environmental Radiological Monitoring Program

The purpose of the Environmental Radiological Monitoring Program is to measure radionuclides in the ambient environmental media. These data allow for a comparison of sample data to results from previous years and baseline data to determine what impact, if any, the WIPP facility is having on the surrounding environment. Radiological monitoring at and around the WIPP site includes sampling analyzing air, groundwater, surface water, sediment, soil, and biota. The radionuclides analyzed include ^{238}Pu , $^{239/240}\text{Pu}$, ^{241}Am , $^{233/234}\text{U}$, ^{235}U , ^{238}U , ^{137}Cs , ^{60}Co , ^{40}K , and ^{90}Sr . Plutonium and americium isotopes were analyzed because they are the most significant alpha-emitting radionuclides among the constituents of TRU wastes received at the WIPP facility. Uranium isotopes were analyzed largely because they represent prominent alpha-emitting radionuclides in the natural environment.

Strontium-90, ^{60}Co , and ^{137}Cs were analyzed to demonstrate the ability to quantify these beta- and gamma-emitting radionuclides, should they appear in the TRU waste stream. These radionuclides have been the subject of background studies at WIPP prior to 1999 and continue to be monitored. Potassium-40, a natural gamma-emitting radionuclide that is ubiquitous in the Earth's crust, was also monitored because of its possible enhancement in southeastern NM due to potash mining and its stability as a natural radionuclide normally present within a narrow concentration range.

The radionuclide analysis results for the CY ASER samples are provided in appendix F.

4.1 AIRBORNE EFFLUENT PARTICULATES

4.1.1 Sample Collection

Radiological air sampling at Stations B, C, and G use skid-mounted fixed air samplers at each effluent air sampling station. The air volume sampled at each location varied depending on the sampling location and configuration. Each system is designed to provide a representative sample using a 3.0-micrometer pore size, 47-millimeter (mm) diameter acrylic copolymer membrane filter.

Station G is a new monitoring station that was constructed for the Safety Significant Confinement Ventilation System (SSCVS). In April 2025, a coefficient of variance test (figure 4.0) was completed and the station was inspected by EPA. Station G was then approved for use as the new official compliance point. Station G started up in mid-July 2025 once the SSCVS came online. Station B was tagged out of service once Station G was started.



Figure 4.0 – Start of Coefficient of Variance Testing at Station G

Daily (24-hour) filter samples were collected from the underground exhaust air commensurate with the ventilation configuration (i.e., Station B and G). Approximately 19,585 cubic feet (ft³) (554 m³) of air was sampled each week through the acrylic copolymer membrane filters at Station B and approximately 20,160 ft³ (571 m³) of air was sampled at Station G. There were brief periods when sampling associated with these sampling locations was interrupted during the CY, including planned outage periods when there was no underground ventilation flow; however, total air volume sampled was well within the specified recovery limits. Based on the specified sampling periods, these air volumes were within plus or minus ($\pm$) 10 percent of the volume derived using the flow rate set point of 0.057 cubic meters per minute (m³/min) (2 cubic feet per minute [ft³/min]) for Station B and Station G. The amount of air filtered through

the Station B and G acrylic copolymer membrane filters during the CY was 548,397 ft³ (15,528.88 m³) and 494,708 ft³ (14,008 m³), respectively. The primary emission samples are collected daily or more often at Stations B, and G. During the CY, the Exhaust Shaft ventilation system operated normally at a nominal flow rate of 114,000 ft³/min for Station B and 500,000 ft³/min for Station G.

Weekly filter samples were collected at Station C, which samples the air from the WHB after HEPA filtration. The amount of air filtered through the Station C acrylic copolymer membrane filters during the CY was 196,987.83 ft³ (5,578.07 m³). Even though there were brief periods where sampling associated with Station C was interrupted during the CY, the total air volume sampled was within the specified recovery limits. The calculated air volume for Station C was within ± 10 percent of the average volume derived using the flow rate required for isokinetic sampling conditions. The sampling flow rate for Station C automatically tracks proportionately to the exhaust airflow in the WHB to maintain isokinetic sampling conditions.

The Station C effluent air sampling system was designed in accordance with ANSI Standard N13.1-1969, *Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities*. The isokinetic sampling configuration did not change, thus maintaining compliance with the 1969 standard. This is consistent with retaining pre-2000 “grandfathered” air emission sampling systems since ANSI/HPS N13.1-1999 does not address isokinetic sampling.

Stations B and G were the sampling points of record for emissions from the underground repository during the CY. These samples were collected once per day or more often depending on the ventilation configuration. The Station B and G samples were assembled into monthly composite samples. The weekly filter samples for Station C were composited each quarter. Filter sample composites were analyzed for ²⁴¹Am, ²³⁸Pu, ^{239/240}Pu, ⁹⁰Sr, ^{233/234}U, ²³⁸U, and ¹³⁷Cs.

Salt Handling Shaft portable air sampler (PAS) filters were collected daily until March 18, 2025. After this date, the SVS was no longer operated and the SHS PAS was not needed. An annual administrative review was conducted for this location.

4.1.2 Results and Discussion

Stations B, C, and G operated within specifications, and no calculated adjustments to sample data were necessary for 2025. The analytes of interest were ²⁴¹Am, ²³⁸Pu, ^{239/240}Pu, ⁹⁰Sr, ^{233/234}U, ²³⁸U, and ¹³⁷Cs.

Radioanalytical results of air filter samples representing WIPP facility air emissions in the CY are shown in appendix F, tables F.1, F.2, and F.3. The CAP88-PC radioactivity input criterion was to compare the 2 σ TPU with the activity value. The higher result of the two was selected for the nuclide data input for the CAP88-PC dataset, ensuring a conservative bias to the dataset. The MDC, calculated before the analysis is performed, indicates the expected analytical sensitivity for that test.

For the SHS PAS, an administrative review was performed of the SVS, including trending of underground ventilation air sample radioactivity levels, to confirm the

absence of radioactive materials in forms and quantities not conforming to prescribed specifications and limits during this reporting period. Radiochemical analyses were conducted to verify that detected radionuclides remained below an action level indicating potential contaminant detection at or near the PIC 4 constraining values.

Evaluation of the CY filter sample results using the latest EPA-approved CAP88-PC code in effect during the CY, CAP88-PC Version 4.1.1.0, indicated that there were no detectable releases from the WIPP facility that resulted in a dose that exceeded the 40 CFR § 191.03(b) limits of 25 mrem (0.25 mSv) to the whole body and 75 mrem (0.75 mSv) to any critical organ. In addition, there were no detectable airborne releases from the WIPP facility that resulted in a dose that exceeded the 10 mrem/yr (0.1 mSv/yr) limit, as specified in 40 CFR § 61.92, and the 1% of 10 mrem/yr (0.1 mSv/yr) limit for periodic confirmatory sampling required by 40 CFR § 61.93(b)(4)(i).

4.2 AIRBORNE AMBIENT PARTICULATES

4.2.1 Sample Collection

Ambient air is the surrounding atmosphere, usually the outside air, as it exists around people, animals, plants, and structures. It does not include the air adjacent to emission sources (DOE-HDBK-1216-2015). Weekly airborne ambient particulate samples were collected from seven legacy locations at or near the WIPP site (figure 4.1) using low-volume air samplers. Sample head heights are representative of the typical breathing zone. Location codes are shown in appendix B.

Weekly samples are composited quarterly for analysis. Assuming no downtime and a stable flow rate, for each week approximately 20,160 ft³ (571 m³) of air is sampled through a 1.85-in (4.7-centimeter [cm]) diameter glass microfiber filter for the continuous low-volume air samplers set at a flow rate of 2 ft³/min. For a quarterly composite (13 weeks), the volume of air for best-case scenario conditions is approximately 262,459 ft³ (7,423 m³).

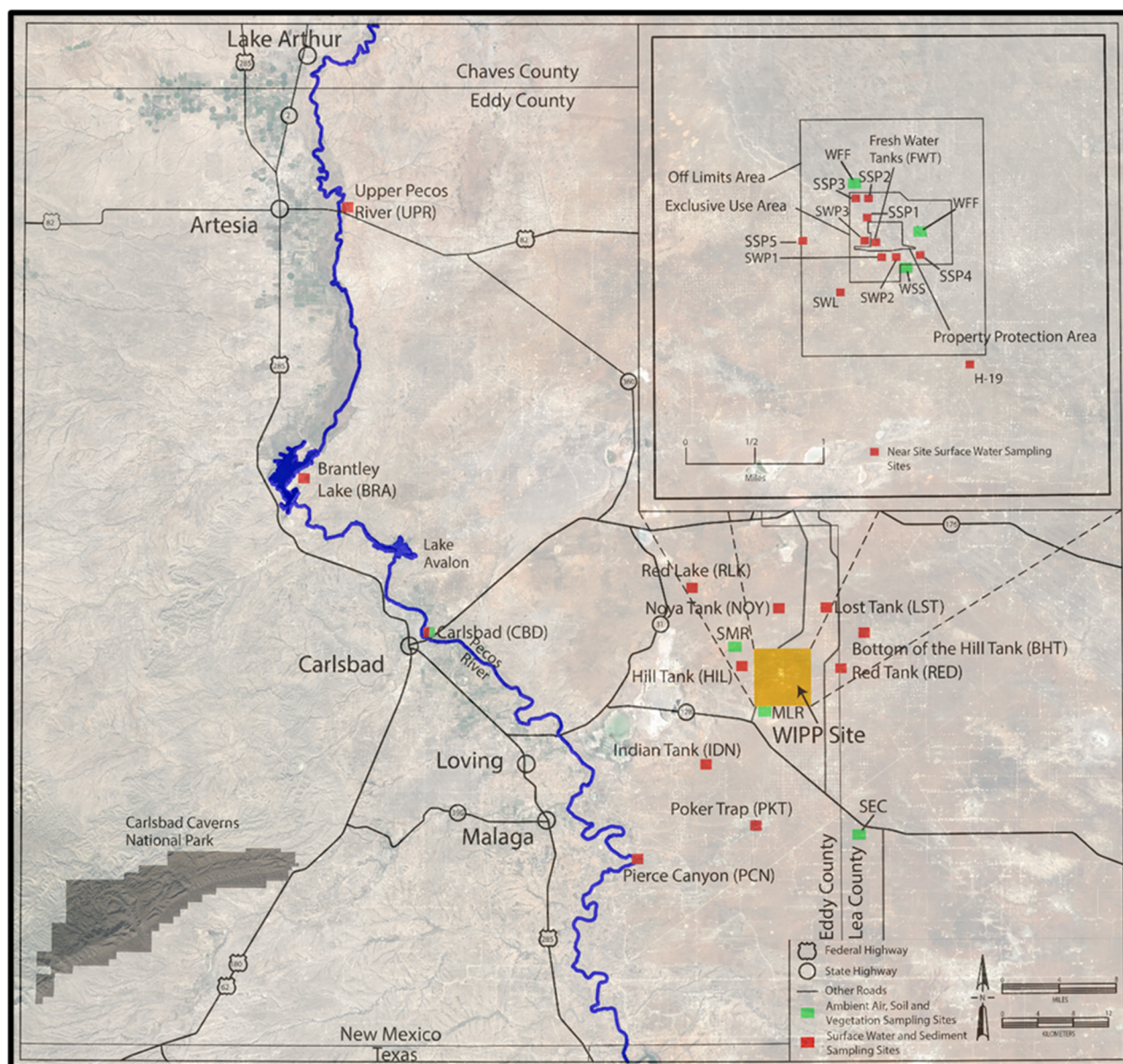


Figure 4.1 – Ambient Air, Soil, Vegetation, Surface Water, and Sediment Sampling Locations on and Near the WIPP Site

4.2.2 Results and Discussion

The quarterly composite sample data are reported in units of becquerel per composite air filter sample (Bq/sample) by the laboratory. Blank filter composite samples were prepared and analyzed, and results were reported separately for each quarter. The average concentrations of the quarterly composite samples are reported for those locations where quality control (QC) duplicate samples were collected using low-volume air samplers. Duplicate samples were collected at one sample location each quarter. During the CY, the duplicate sample locations for the first, second, third, and fourth quarters were WFF, WEE, WSS, and CBD, respectively. Due to a sampling error, duplicate sampling was delayed during two quarters, beginning on April 30, 2025, for WEE and on July 16, 2025, for WSS. Appendix F, table F.4, contains the results in

Bq/sample for the quarterly air filter composite samples. A “Q” (qualifier) column is included in table F.4 of appendix F to show whether the radionuclide was detected (i.e., whether the activity of the radionuclide is greater than the 2σ TPU and MDC). Table F.5 in appendix F shows the Bq/sample from table F.4 converted to Bq/m³ by dividing the sample activity in Bq by the total quarterly air volumes sampled. In addition to the annual sampling site locations, a sample of opportunity (SOO) was taken for additional scrutiny and robustness (see appendix F, tables F.4 and F.5). This sample was taken from the southeast quadrant of the PPA of the WIPP site. Results of the SOO are similar to historical SOO measurements. Historical measurements of ^{239/240}Pu and ²⁴¹Am since annual collection began are shown in Figures 4.2a and 4.2b, respectively. Measurements of ¹³⁷Cs and ⁶⁰Co over the last 10 years are shown in Figures 4.3a and 4.3b, respectively. In all cases there is no apparent trend in concentration of these radionuclides over the last ten years. The large increases in uncertainty in the last two quarters for 2025 reflect a change in contract laboratories (see chapter 7), and differences in their methods.

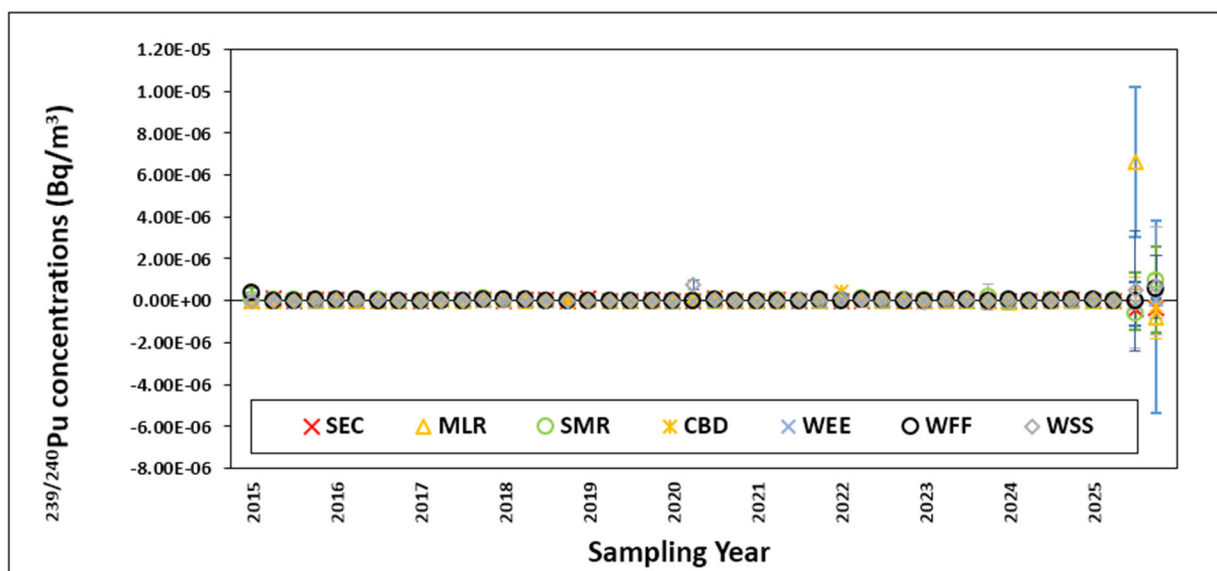


Figure 4.2a – Historical Concentrations of ^{239/240}Pu at Seven Air Sampling Locations Over the Last 10 Years

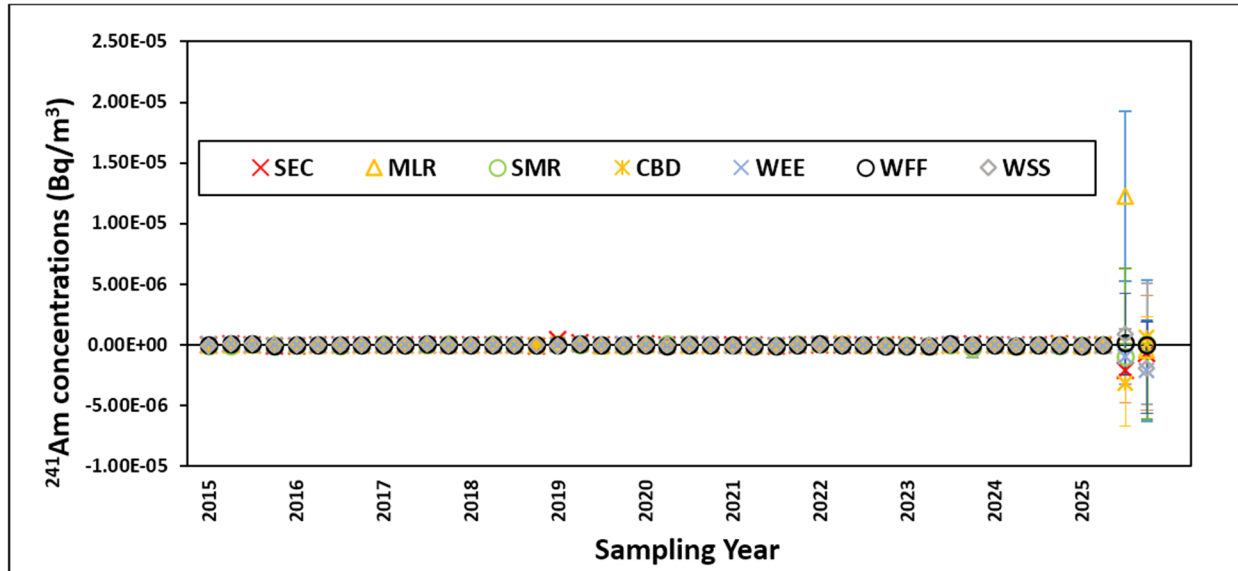


Figure 4.2b – Historical Concentrations of ^{241}Am at Seven Air Sampling Locations Over the Last 10 Years

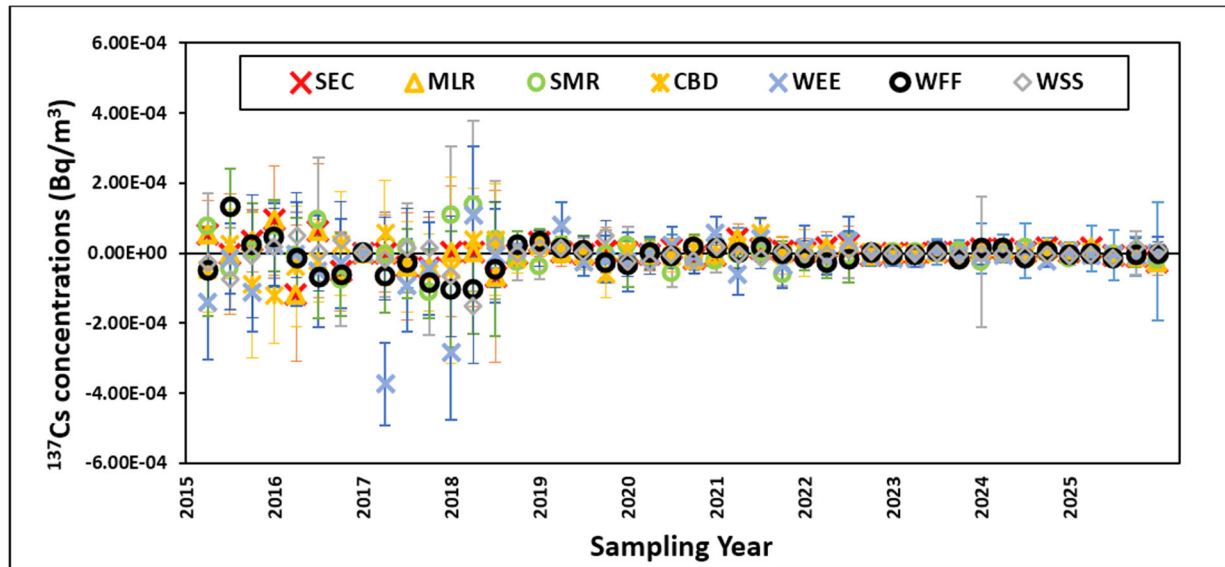


Figure 4.3a – Historical Concentrations of ^{137}Cs at Seven Air Sampling Locations Over the Last 10 Years

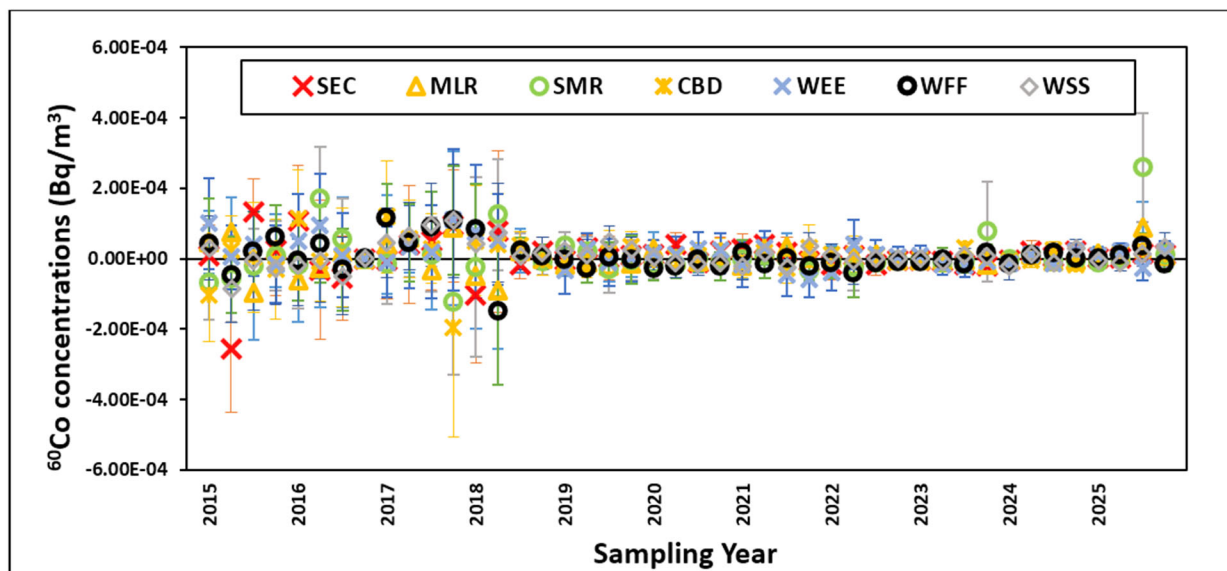


Figure 4.3b – Historical Concentrations of ^{60}Co at Seven Air Sampling Locations Over the Last 10 Years

4.3 SURFACE WATER

4.3.1 Sample Collection

The *Waste Isolation Pilot Plant Environmental Monitoring Plan* (DOE/WIPP-99-2194) includes routine regional and local surface water and sediment sampling that extends as far north as Artesia, NM, on the upper Pecos River, to as far south as Pierce Canyon on the lower Pecos River. Figure 4.1 (see appendix B for sampling location codes) shows the locations where samples are collected annually and reported in the ASER. If a particular surface water collection location was dry, only a sediment sample was collected. Sediment sample analysis results are discussed in section 4.4.

Surface water and sediment sampling is normally performed in late summer of every year. At times, the cattle tanks (earthen ponds) are dry, and only sediment samples can be obtained. The CY for both surface water and sediment sampling was completed by spring. The sampling locations selected represent the major bodies of surface water and potential livestock uptake locations in the WIPP vicinity. There are four sampling locations on the Pecos River: the Upper Pecos River near Artesia (UPR), Brantley Lake (BRA), Carlsbad (CBD), and Pierce Canyon (PCN). Area ranches used eight dirt tanks (earthen catchment basins) to collect precipitation runoff water for livestock. These tanks are Red Lake (RLK), Noya (NOY), Red (RED), Indian (IDN), Lost (LST), Bottom of the Hill (BHT), Poker Trap (PKT), and Hill (HIL). One other type of surface water sample consisted of water from the WIPP sewage lagoons (SWL). Another sample collected is from the Fresh Water Tank (FWT), which is from the WIPP domestic water supply system (Double Eagle), piped in from a remote public water well source. It is categorized as surface water because it is altered due to onsite chlorination and sampled from a faucet in the WIPP site pump house.

Each year, two sets of duplicate surface water samples are taken: a primary duplicate and a semi-blind duplicate. For this CY, the primary duplicate was collected at (HIL), and the blind was collected at (identified as COY, sampled at the RED sample location). The deionized water field blank, (COW) was submitted to the laboratory as a semi-blind QC sample. A sample collected from SWL routinely consists of a composite of Settling Lagoons 1 and 2, Effluent Lagoons A, B, and C, and Polishing Lagoons 1 and 2, but depends on water availability.

4.3.2 Results and Discussion

The surface water samples were analyzed for ^{238}Pu , $^{239/240}\text{Pu}$, and ^{241}Am , as shown in appendix F, table F.8. None of these radionuclides were detected in the surface water samples in 2025. The analysis data for the gamma isotopes and ^{90}Sr are presented in appendix F, table F.9. Naturally occurring $^{233/234}\text{U}$, ^{235}U , ^{238}U , and ^{40}K were detected in multiple samples, within expected ranges. Only one sample, from UPR, was measured above the 99 percent confidence interval for baseline concentration for ^{238}U (see section 4.9.2).

4.4 SEDIMENTS

4.4.1 Sample Collection

Sediment samples were collected from 12 locations around the WIPP site (figure 4.1), and a duplicate sample was collected from RED, for a total of 13 samples. See appendix B for location codes.

4.4.2 Results and Discussion

The radionuclides ^{234}U , ^{235}U , and ^{238}U , which are naturally occurring, were detected at multiple locations. At no locations were these radionuclides measured above the 99 percent confidence interval for baseline concentration (see section 4.9.2). As with previous years, no ^{238}Pu , $^{239/240}\text{Pu}$, and ^{241}Am , were detected at any location; the results are shown in appendix F, table F.11. Concentration plots presented in figures 4.4a and 4.4b show historical concentrations of $^{239/240}\text{Pu}$ at the sampling locations.

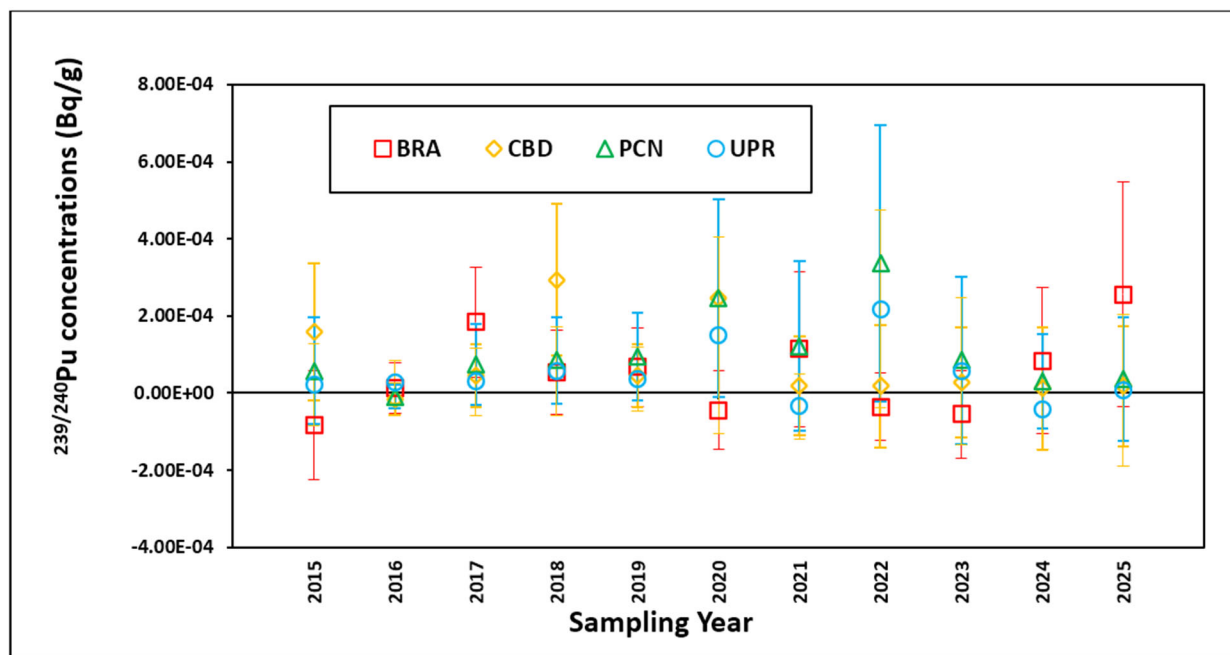


Figure 4.4a – Historical Concentrations of $^{239/240}\text{Pu}$ in Sediment Samples at Pecos River and Associated Bodies of Water Over the Last 10 Years

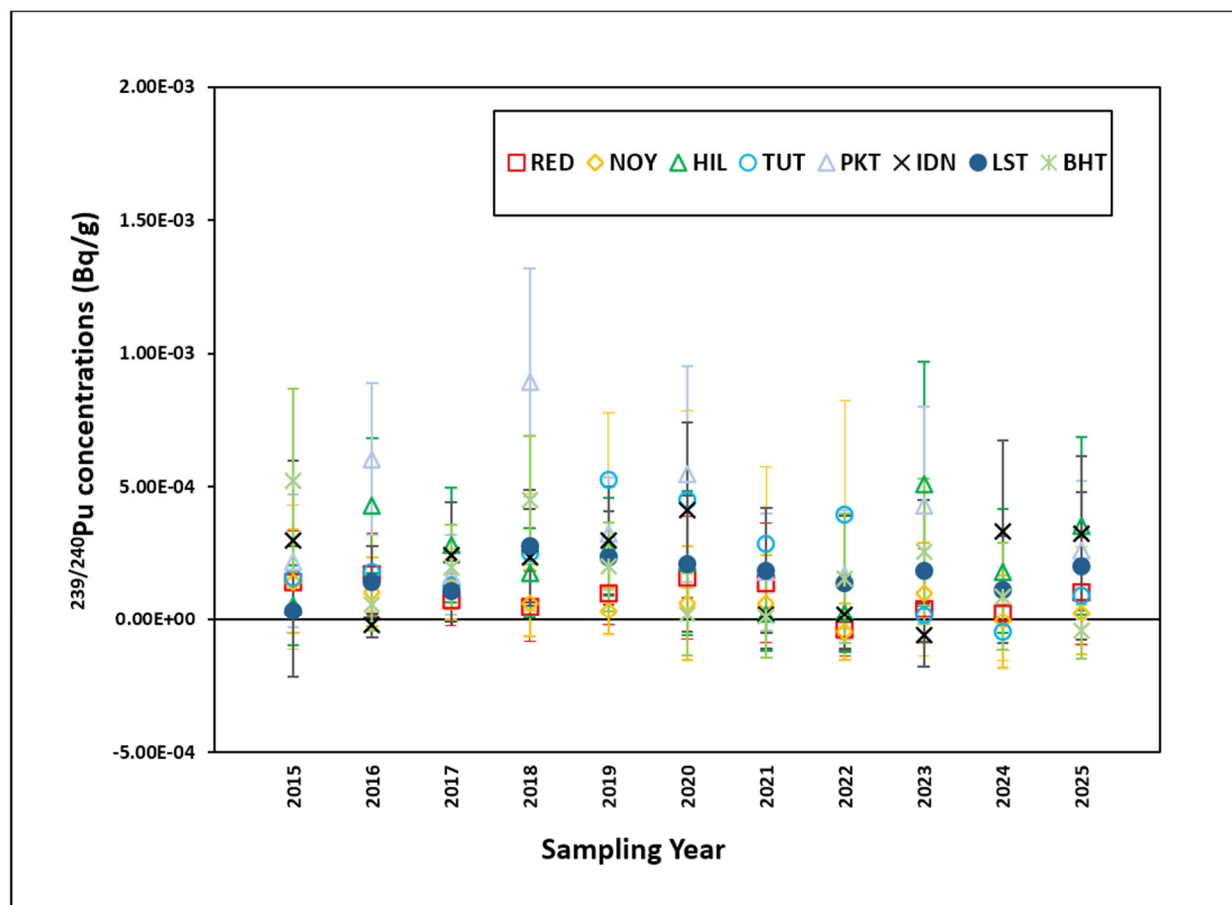


Figure 4.4b – Historical Concentrations of $^{239/240}\text{Pu}$ in Sediment Samples at Tanks and Tank-like Structures Over the Last 10 Years

The sediment analysis results for the gamma radionuclides and ^{90}Sr are shown in appendix F, table F.12. Strontium-90 and ^{60}Co were not detected in any sample. Cesium-137 was detected in the HIL primary and duplicate samples, as well as the RED, BHT, and PKT samples. The highest concentration of ^{137}Cs in tanks and tank-like structures, with a value of $9.37\text{E-}03$ Bq/g (figure 4.5), was at PKT. This is below the baseline concentration of $3.50\text{E-}02$ Bq/g for tanks and tank-like structures. No trends have been observed over the last 20 years.

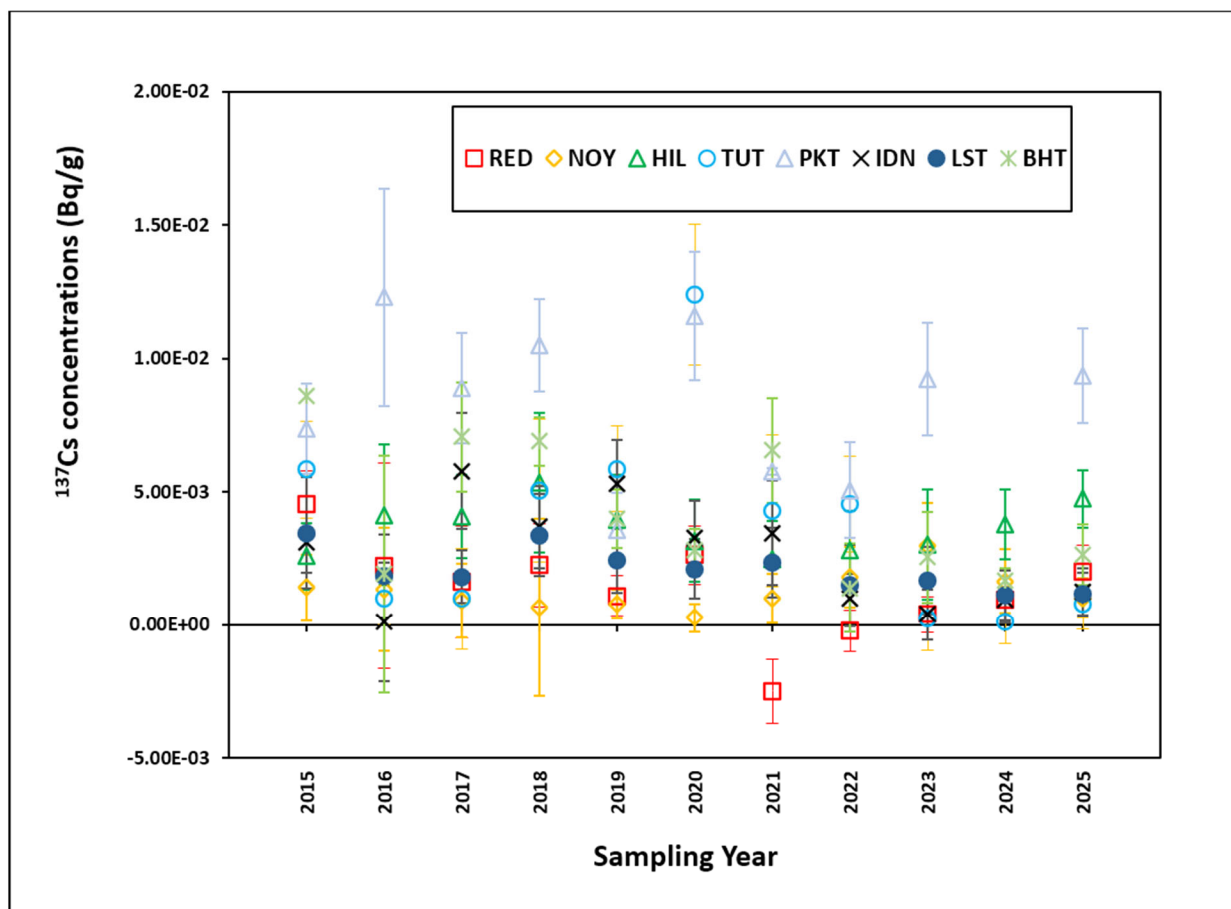


Figure 4.5 – Historical Concentrations of ^{137}Cs in Sediment Samples at Tanks and Tank-like Structures Over the Last 10 Years

4.5 SOIL SAMPLES

4.5.1 Sample Collection

Regular soil samples were collected from the same six locations where the low-volume air samplers are stationed around the WIPP site: WFF, WEE, WSS, MLR, SEC, and SMR (figure 4.1), with a duplicate sample collected from WSS. Samples were collected from each location in three incremental profiles: surface (shallow) soil (0–2 cm [0–0.8 in]), intermediate soil (2–5 cm [0.8–2 in]), and deep soil (5–10 cm [2–4 in]). Measurements of radionuclides in depth profiles may provide information about their vertical movements in the soil systems.

Soil sample locations are divided into three geographic groups.

- The WIPP site group covers the smallest area with locations within 1 km (0.62 mi) of the WHB and Exhaust Shaft and includes WFF, WEE, and WSS.
- The 5-mile ring group includes MLR and SMR.
- The outer sites group only includes sampling location SEC.

Soil samples were collected at WFF, WEE, and WSS on March 6, 2025. Locations MLR, SMR, and SEC were collected on April 3, 2025.

4.5.2 Results and Discussion

Measurements of $^{233/234}\text{U}$, ^{235}U , and ^{238}U for this CY are presented in appendix F, table F.13. Uranium-235 was detected in the WSS duplicate sample at 0–2 cm, though was undetected in the WSS primary sample, and ^{235}U was also detected in WEE at 0–2 cm. Uranium-233/234 was detected in WEE at all three depths, and in the WSS duplicate sample at all three depths, but not in the WSS primary sample. Uranium-238 was detected at all three depths of WEE, and all three depths of WSS duplicate but not WSS primary. In one sample, WEE at 2–5 cm depth, $^{233/234}\text{U}$ was measured above the 99 percent confidence interval range of the baseline concentration (see section 4.9.2). All uranium isotopes are naturally occurring, and other detections were below the baseline values.

Measurements of ^{238}Pu , $^{239/240}\text{Pu}$, and ^{241}Am for 2025 are presented in appendix F, table F.14. No detections of any of these radionuclides were made at any depths.

Measurements of ^{40}K , ^{60}Co , ^{137}Cs , and ^{90}Sr are presented in appendix F, table F.15. Potassium-40, which is naturally occurring, was detected in all samples. No detections of ^{60}Co and ^{90}Sr were made. Cesium-137 was detected in WFF at depths 2–5 cm and 5–10 cm, MLR at 0–2 cm and 2–5 cm, WEE at 2–5 cm and 5–10 cm, SMR at all three depths, SEC at 0–2 cm and 2–5 cm, and in both the WSS primary and duplicate samples at 0–2 cm. In one sample, MLR at 5–10 cm depth, ^{40}K was measured above the 99 percent confidence interval range of the baseline concentration (see section 4.9.2).

Overall, all radionuclides are within the trends of the previous years' for all locations, across all three location groups. Figures 4.6 (a, b, and c), 4.7 (a, b, and c), and 4.8 (a, b, and c) show historical concentrations of $^{239/240}\text{Pu}$, ^{241}Am , and ^{137}Cs in WIPP soils, respectively. The values all fell within the range of concentrations previously observed in WIPP soils.

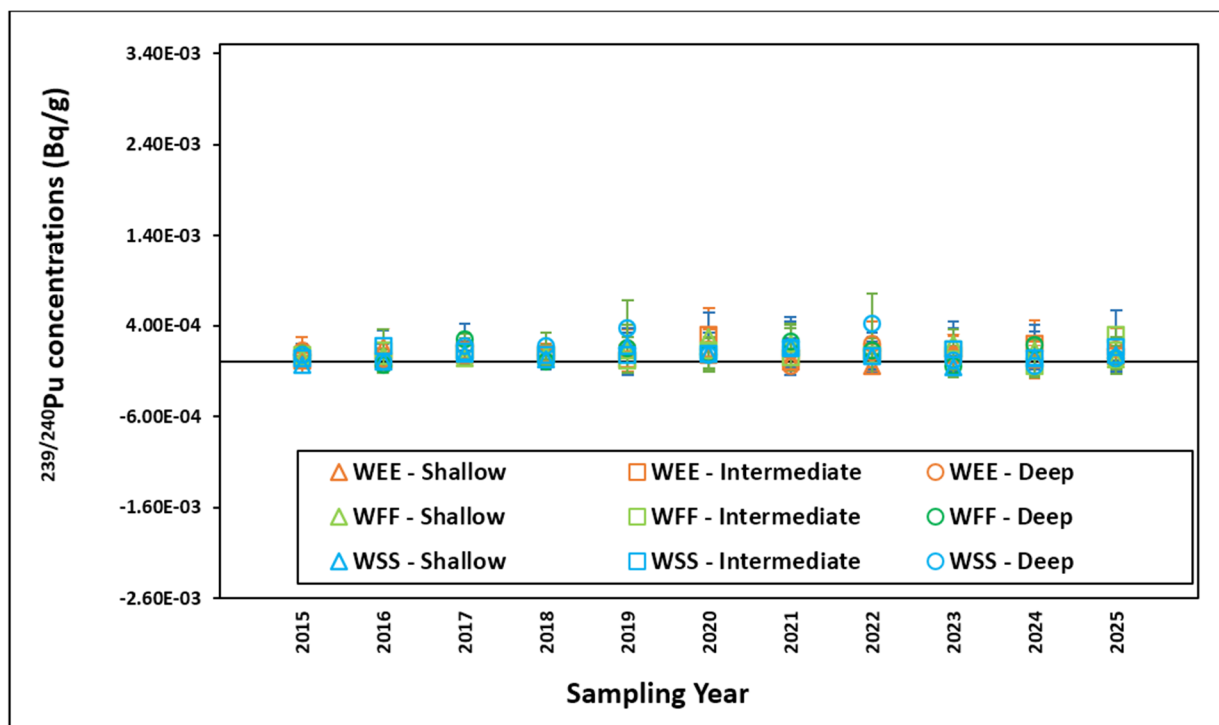


Figure 4.6a – $^{239/240}\text{Pu}$ Concentrations in Soil Samples Collected from WIPP Site Over the Last 10 Years

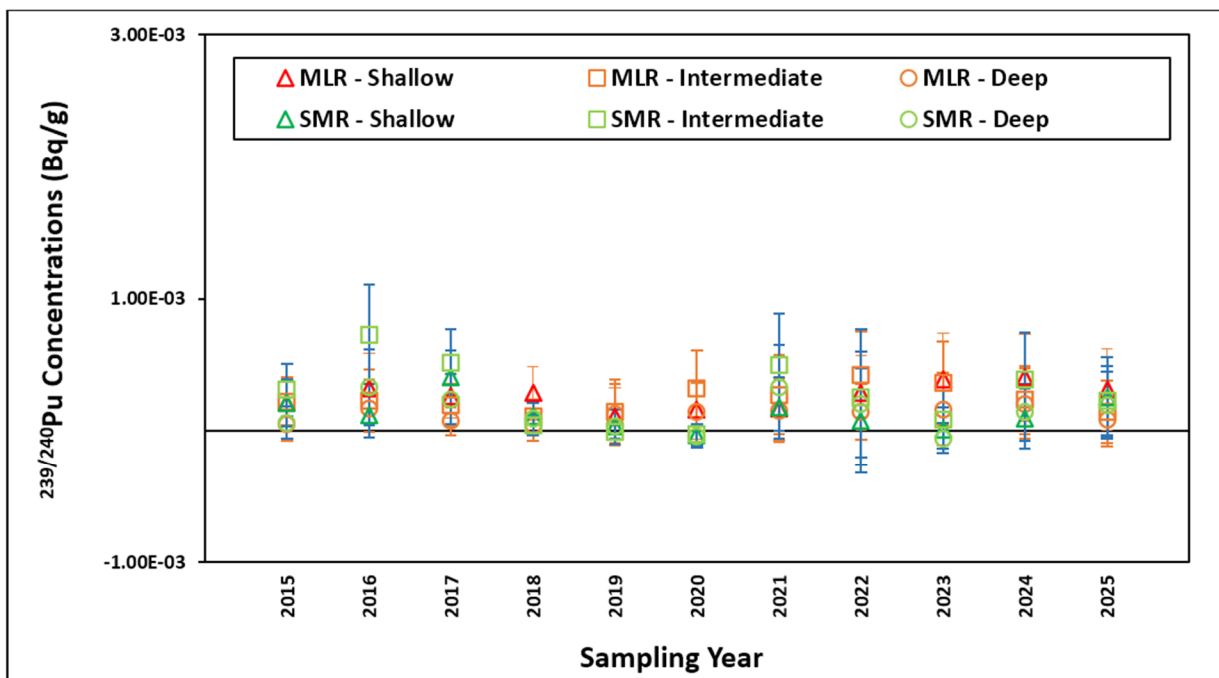


Figure 4.6b – $^{239/240}\text{Pu}$ Concentrations in Soil Samples Collected from 5-mi Ring Over the Last 10 Years

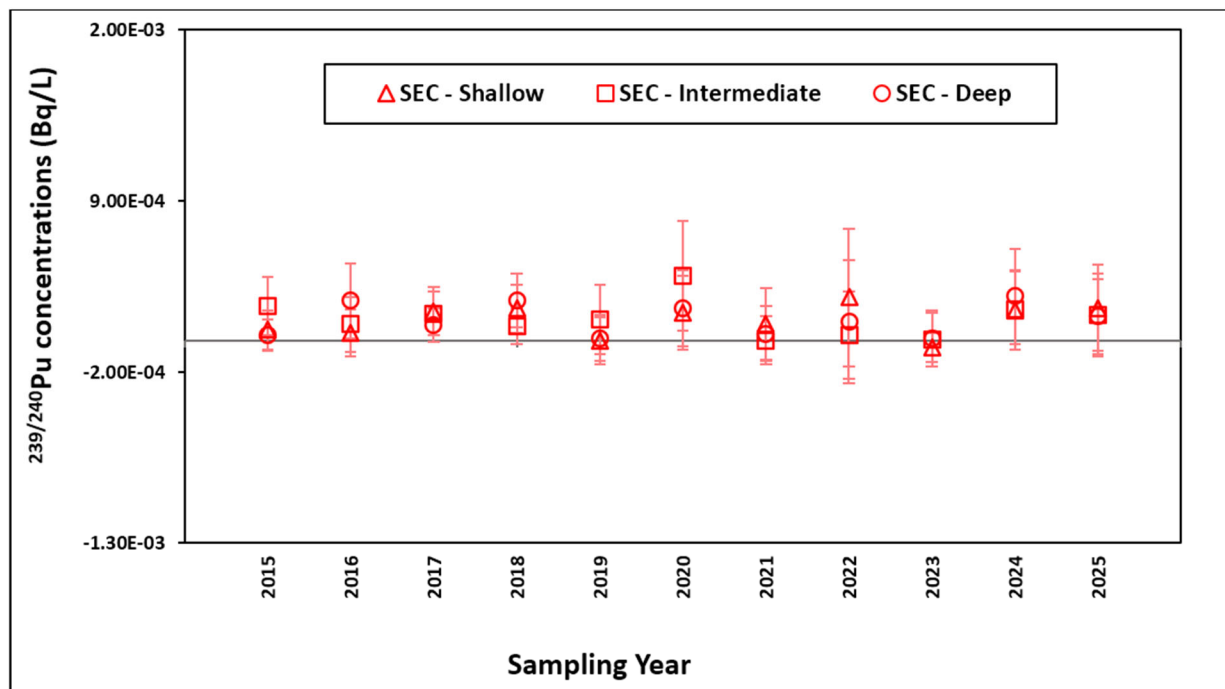


Figure 4.6c – $^{239/240}\text{Pu}$ Concentrations in Soil Samples Collected from Outer Sites Over the Last 10 Years

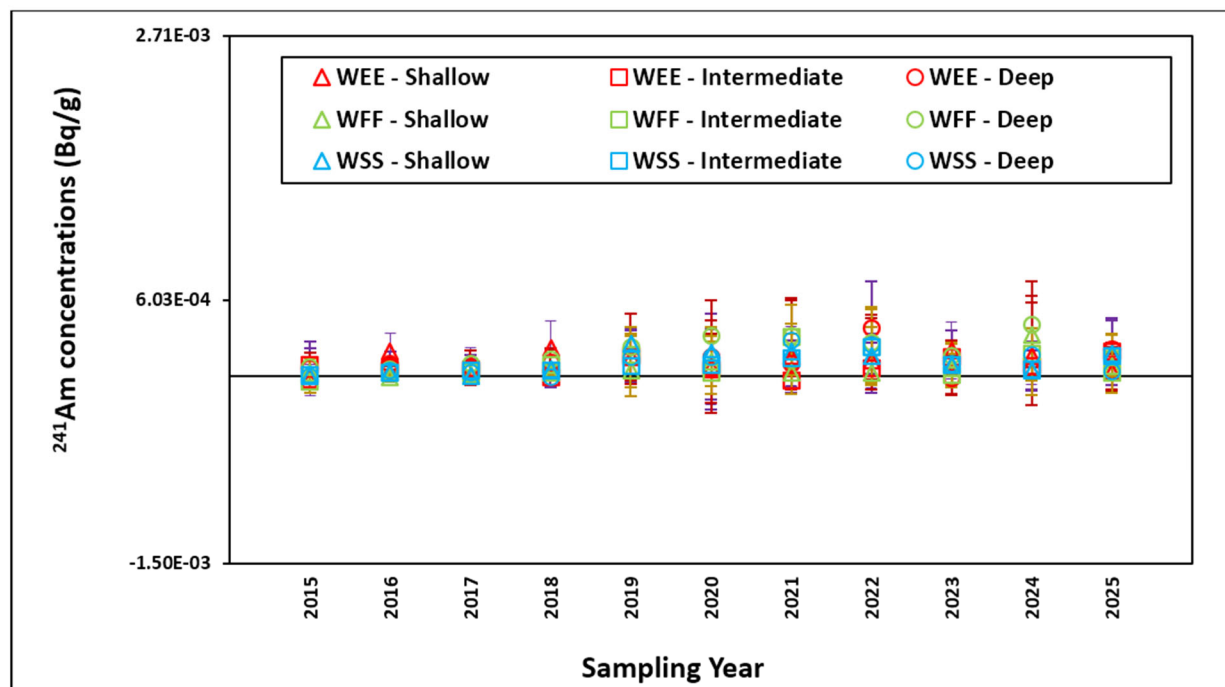


Figure 4.7a – ^{241}Am Concentrations in Soil Samples Collected from WIPP Site Over the Last 10 Years

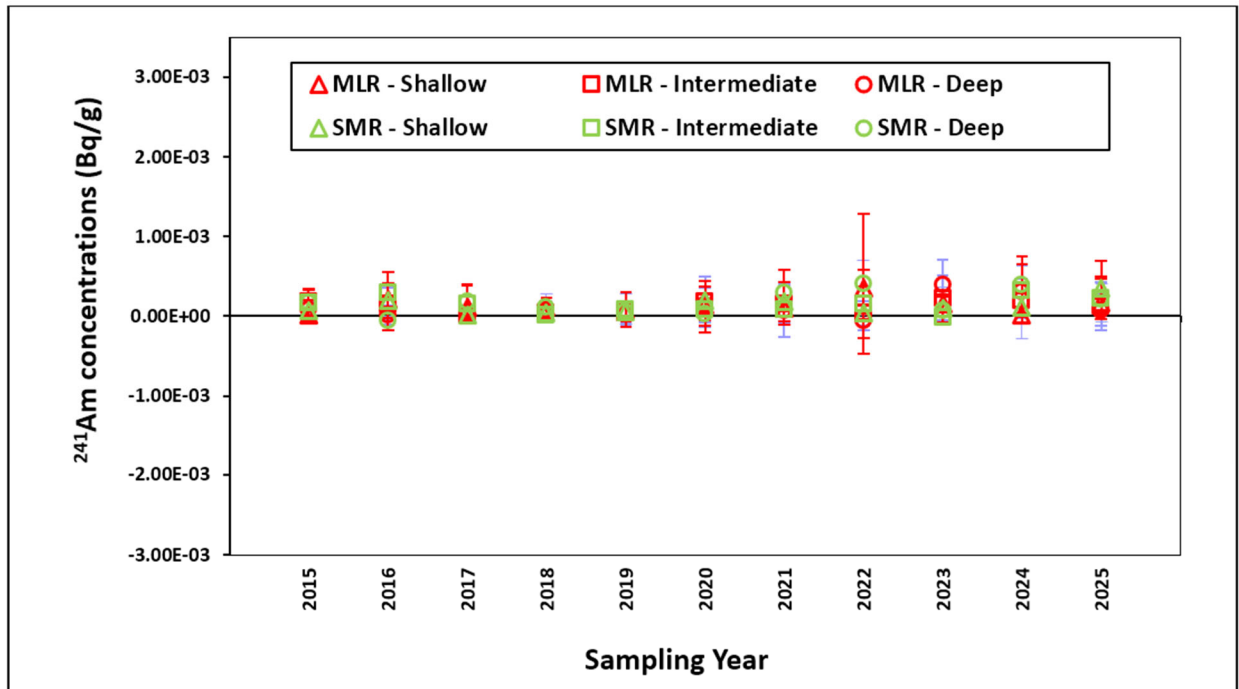


Figure 4.7b – ^{241}Am Concentrations in Soil Samples Collected from 5-mi Ring Over the Last 10 Years

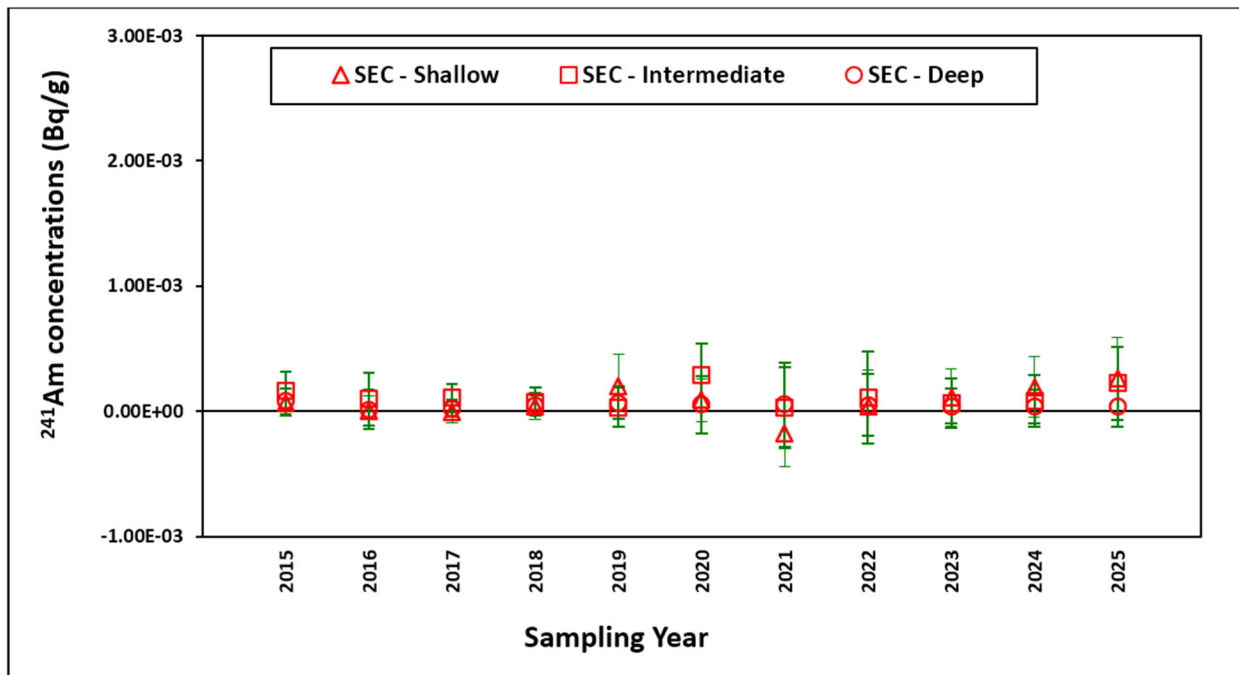


Figure 4.7c – ^{241}Am Concentrations in Soil Samples Collected from Outer Sites Over the Last 10 Years

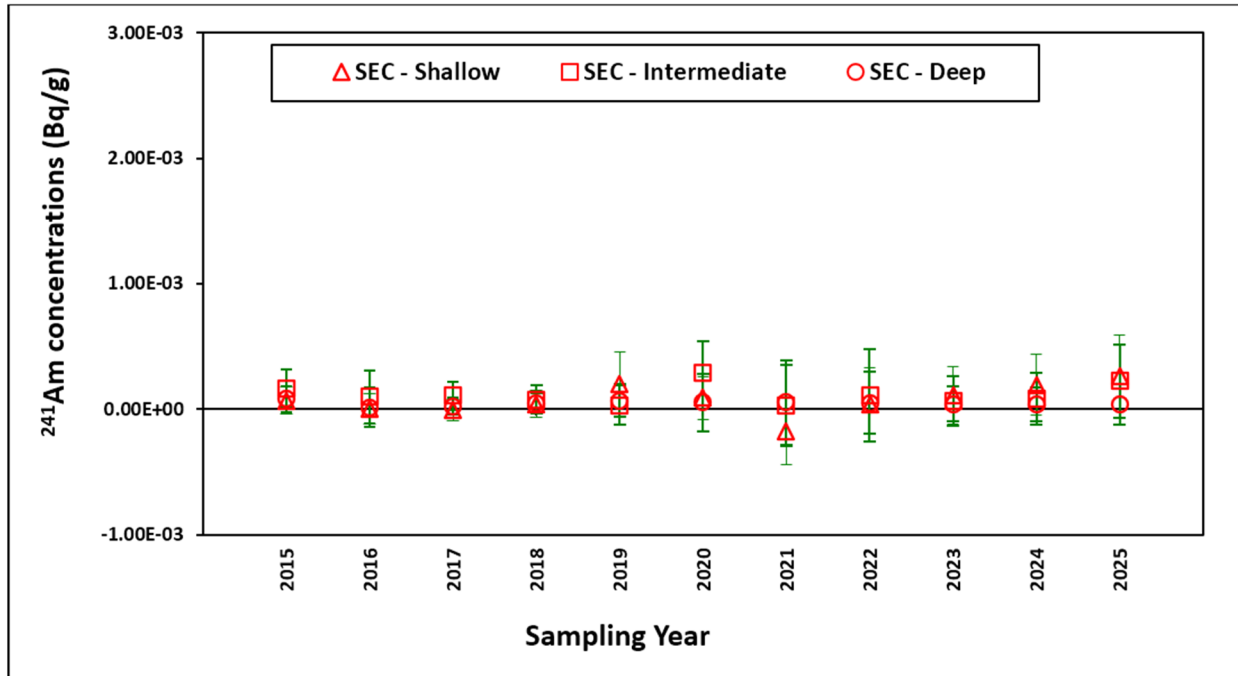


Figure 4.8a – ^{137}Cs Concentrations in Soil Samples Collected from WIPP Site Over the Last 10 Years

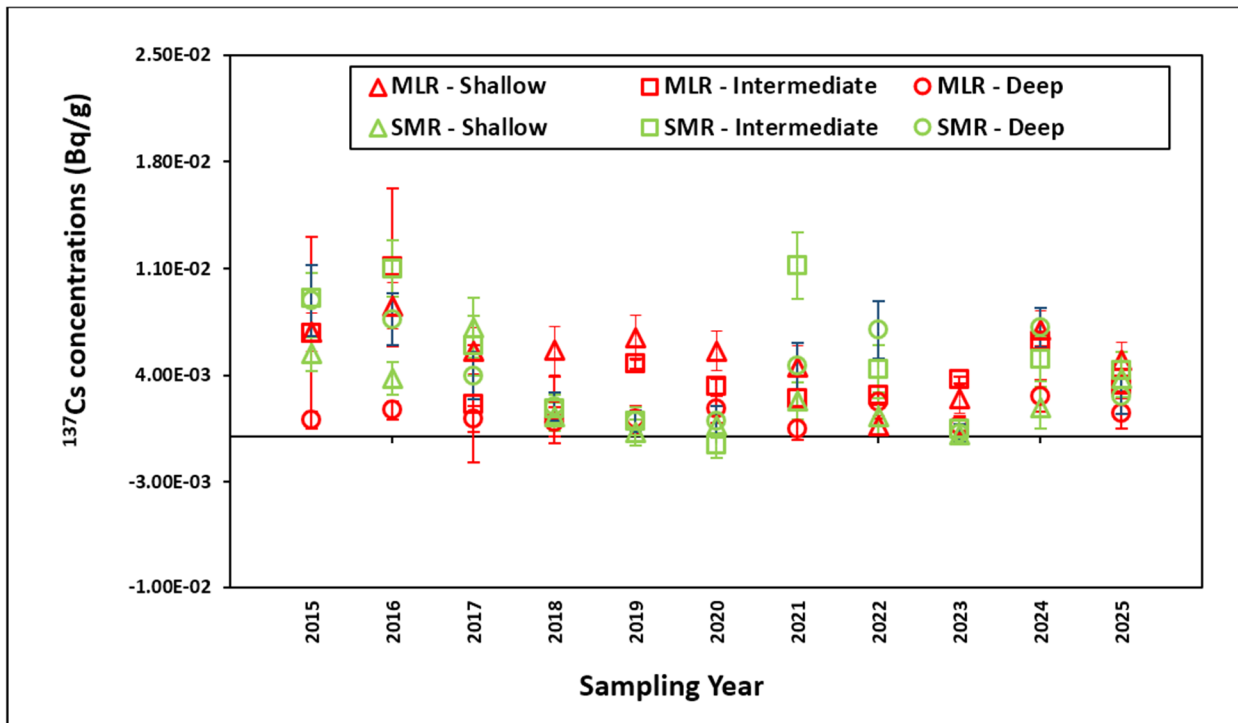


Figure 4.8b – ^{137}Cs Concentrations in Soil Samples Collected from 5-mi Ring Over the Last 10 Years

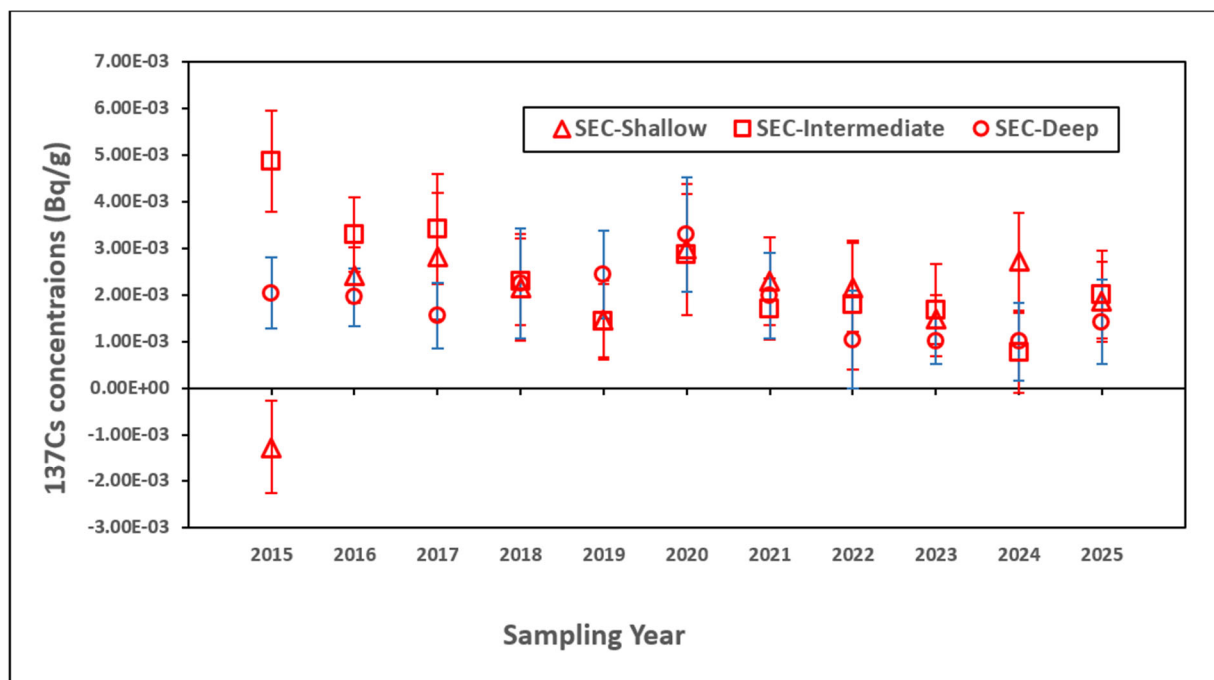


Figure 4.8c – ^{137}Cs Concentrations in Soil Samples Collected from Outer Sites Over the Last 10 Years

4.6 BIOTA

4.6.1 Sample Collection

Rangeland vegetation samples were collected from six locations, WSS, WEE, WFF, SMR, MLR, and SEC. Duplicate samples were collected at WSS in the CY. Fauna (animal) samples were collected when available. In the CY, two rabbit samples and a composite quail sample were collected, all SOOs. Biota samples were analyzed for the 10 target radionuclides.

4.6.2 Results and Discussion

4.6.2.1 Vegetation Samples

There were no detections of any radionuclides in vegetation samples except for ^{40}K , a naturally occurring isotope. Figures 4.9, 4.10, and 4.11 show historical concentrations of $^{239/240}\text{Pu}$, ^{137}Cs , and ^{60}Co in vegetation samples. Appendix F, table F.16, presents the analysis results for the uranium, plutonium, and americium target radionuclides in the vegetation samples from the six locations. A duplicate sample was collected at WSS during the vegetation sampling period in 2025. Appendix F, table F.17, presents the analysis results for the gamma radionuclides and ^{90}Sr during the regular vegetation sampling in the CY. No trends have been observed over the last ten years.

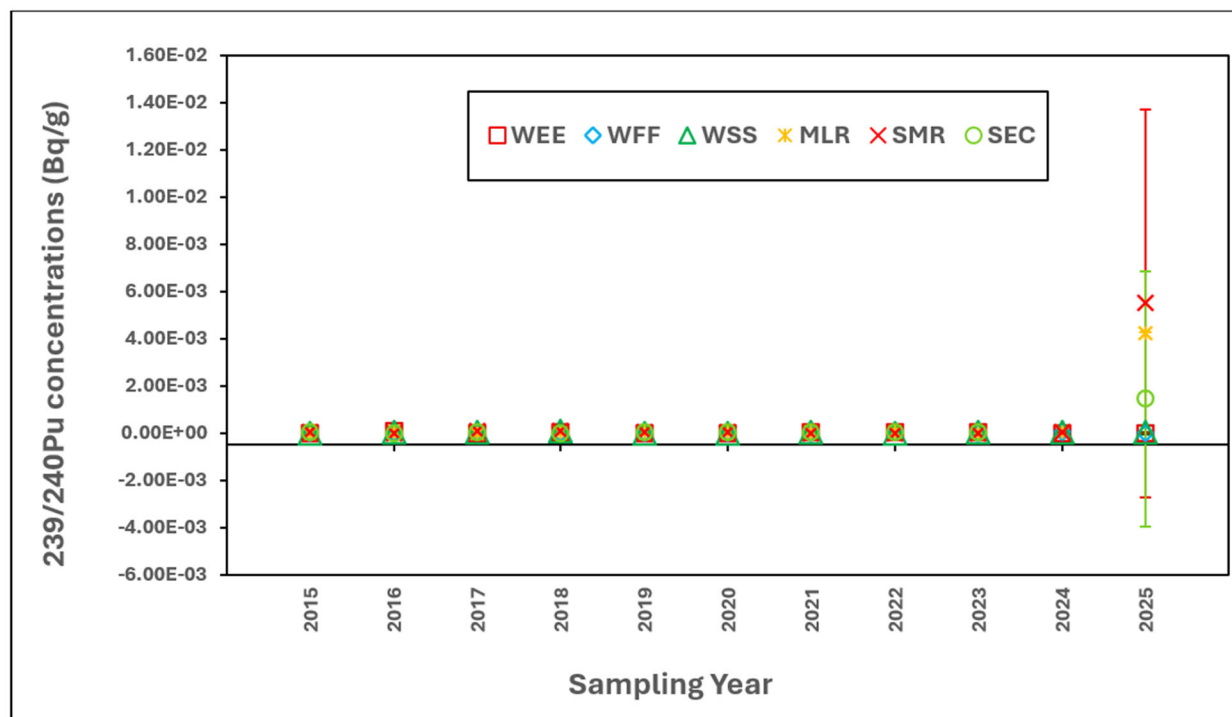


Figure 4.9 – Historical Concentrations of $^{239/240}\text{Pu}$ in Vegetation Samples Collected from Six Sampling Locations Over the Last 10 Years

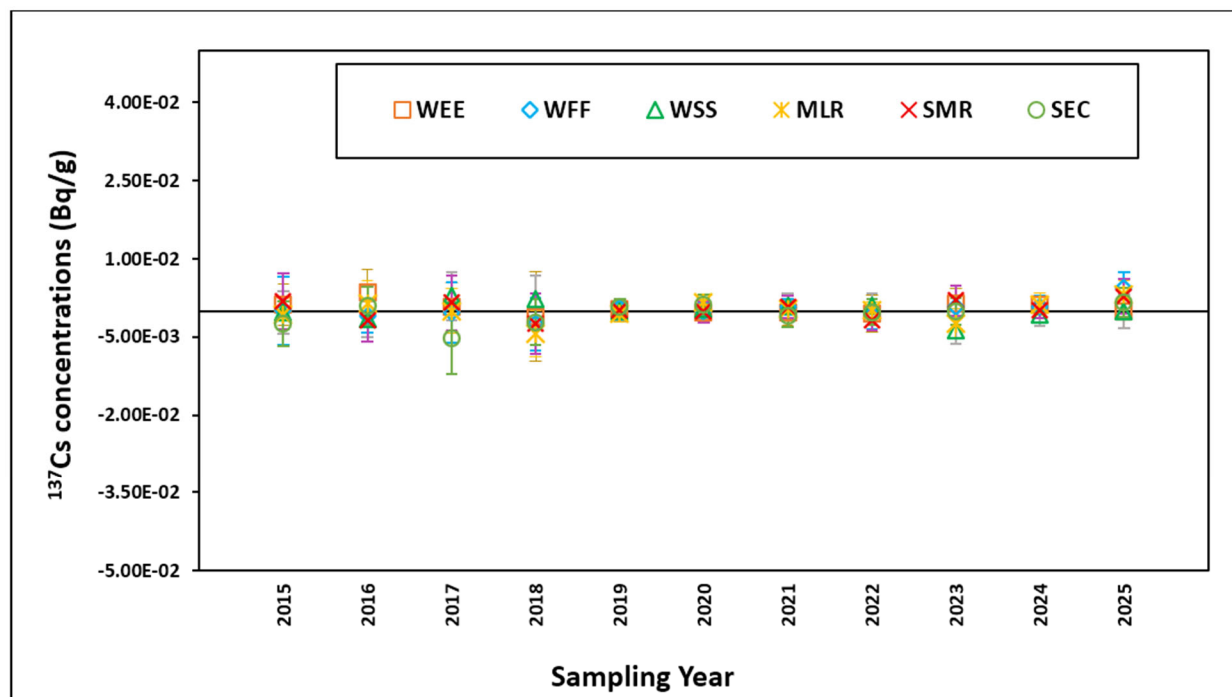


Figure 4.10 – Historical Concentrations of ^{137}Cs in Vegetation Samples Collected from Six Sampling Locations Over the Last 10 Years

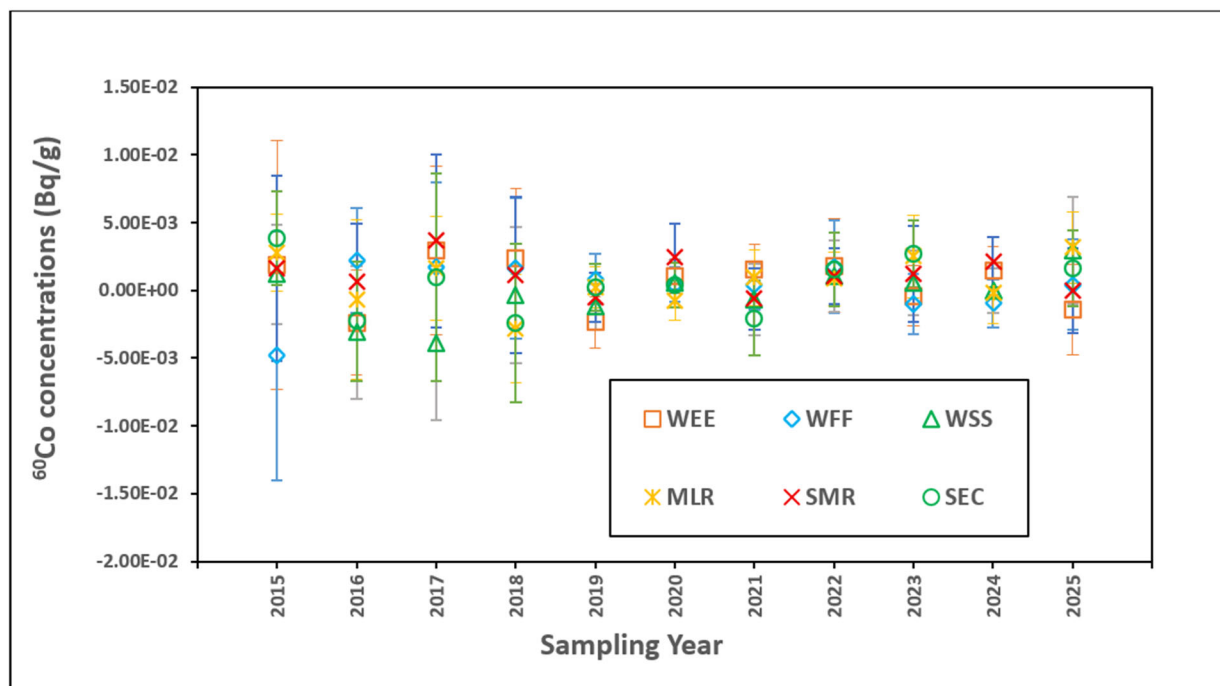


Figure 4.11 – Historical Concentrations of ^{60}Co in Vegetation Samples Collected from Six Sampling Locations Over the Last 10 Years

4.6.2.2 Fauna (Animals)

The fauna samples analyzed include two rabbit samples and one composite quail sample. All were samples of opportunity, with one of the rabbit samples collected on the WIPP site, specifically labeled WIP. The other two samples of opportunity were collected at unspecified locations. The fauna analysis results for radionuclides are presented in appendix F, table F.18, for the uranium, plutonium, and americium isotopes. The gamma radionuclides and ^{90}Sr are presented in appendix F, table F.19. See section 4.8.5 for discussion of biota dosage and biota protection compliance.

4.7 GROUNDWATER

4.7.1 Sample Collection

Groundwater samples were collected once in the CY (round 47) from each of six detection monitoring wells on the WIPP site (figure 4.12). The wells are completed in the Culebra Dolomite Member (Culebra), a water-bearing member of the Rustler Formation (Rustler). The groundwater from the detection monitoring wells was collected from depths ranging from 182 to 262 m (596 to 859 ft) from the six DMP wells (WQSP-1 to WQSP-6).



The data in appendix F, table F.6 show that isotopes of naturally occurring uranium ($^{233/234}\text{U}$, ^{235}U , and ^{238}U) were detected in the groundwater well samples in the CY. The concentrations reported in table F.6 are from the primary samples collected from each DMP well.

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Bq/L. The highest concentration of ^{238}U was $2.22\text{E-}01$ Bq/L in WQSP-1, which was lower than the baseline concentration of $3.20\text{E-}01$ Bq/L. For $^{233/234}\text{U}$ and ^{238}U for WQSP-4 and WQSP-5, the qualifier “UJ” was used (a nuclide that was not detected above the reported MDC and 2 sigma counting uncertainty and a quality deficiency affected the data making the reported data more uncertain). No other measurement for any radionuclide was the baseline concentrations (DOE/WIPP 92-037). The baseline concentrations were based on samples collected from 37 wells, including 23 wells in the Culebra.

The groundwater samples were also analyzed using alpha spectroscopy for the following radionuclides: ^{238}Pu , $^{239/240}\text{Pu}$, and ^{241}Am . These isotopes, which are related to WIPP waste disposal operations, were not detected in any of the groundwater samples as shown in table F.6. Historical concentrations of selected radionuclides are shown in figures 4.13a and 4.13b. The concentrations measured were consistent with those from previous years. The groundwater wells were sampled twice yearly until 2011 when modifications were made to the Permit that required them to be sampled only once a year. Table F.6 also shows the concentration of the other gamma radionuclides and ^{90}Sr , which was not detected in the CY. Other radionuclides were measured and ^{40}K was detected in WQSP-2, WQSP-3, WQSP-4, and WQSP-5 however this is a naturally occurring isotope, and measurements are within the expected range. No other radionuclide was detected in groundwater samples.

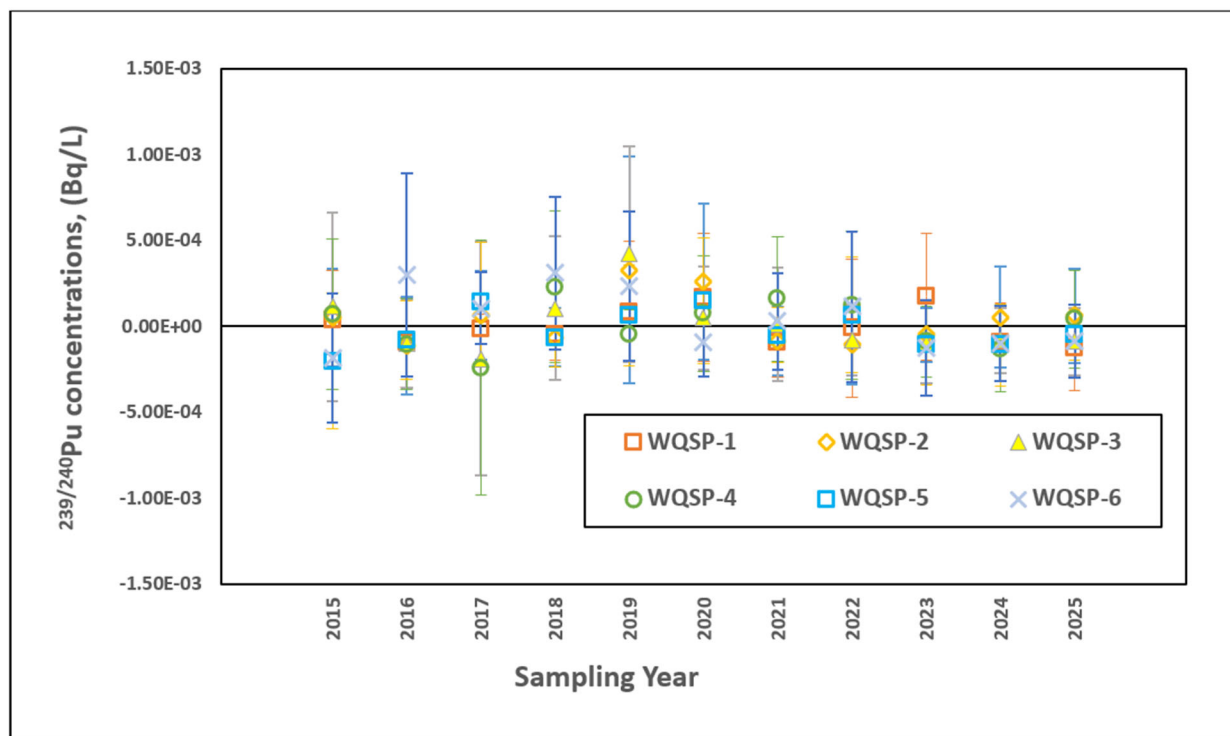


Figure 4.13a – Historical Concentrations of $^{239/240}\text{Pu}$ at Six DMP Wells Over the Last 10 Years

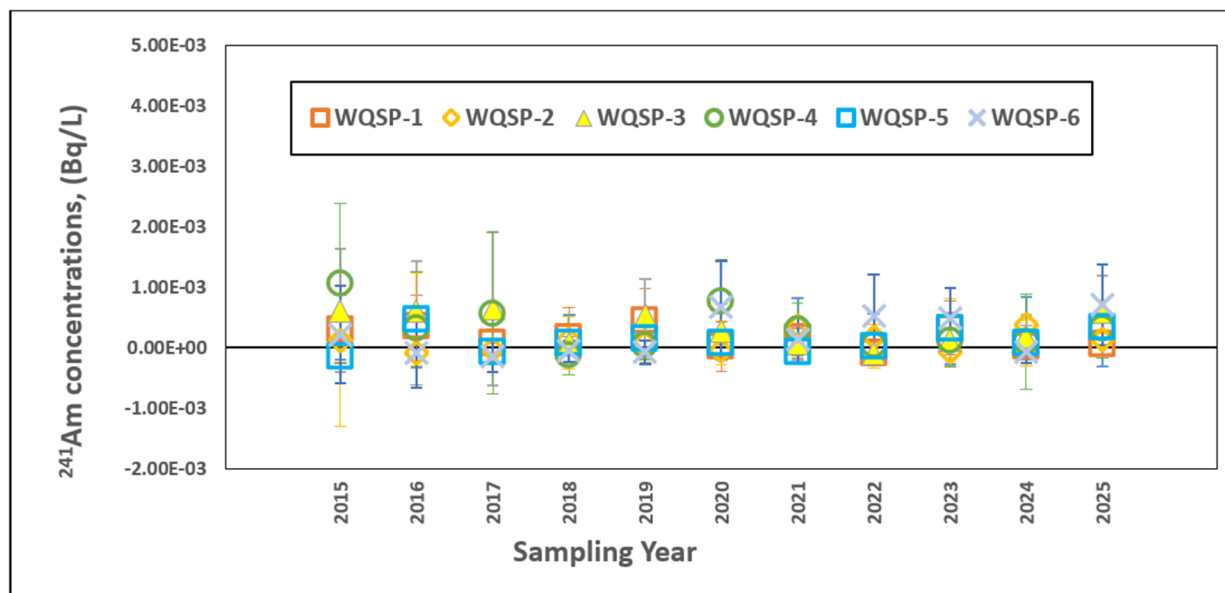


Figure 4.13b – Historical Concentrations of ^{241}Am at Six DMP Wells Over the Last 10 Years

4.8 POTENTIAL DOSE FROM WIPP OPERATIONS

4.8.1 Dose Limits

Compliance with the environmental radiation dose limits is determined by comparing annual radiation doses to the dose limits discussed in the introduction to this chapter.

Compliance with the environmental radiation dose limits is determined by monitoring, assessing, and calculating the EDE. The EDE is the weighted sum of the doses to the individual organs of the body. The dose to each organ is assigned according to the risk that dose represents. These organ doses are then added together, and the total is the EDE. Calculating the EDE to members of the public requires the use of CAP88-PC or other EPA-approved computer models and procedures. The WIPP Effluent Monitoring Program personnel use the EPA emission monitoring and test procedure (40 CFR § 61.93, “Emission Monitoring and Test Procedure”), which requires the use of the EPA-approved Clean Air Assessment Package 1988 (CAP88-PC) (CAP88-PC, 2019) (computer code for calculating both dose and risk from radionuclide emissions) to calculate the EDE to members of the public. The CAP88-PC software uses a modified Gaussian plume dispersion model, which calculates deposition rates, concentrations in food, and intake rates for people. The CAP88-PC software estimates dose and risk to individuals and populations from multiple pathways. Dose and risk are calculated for ingestion, inhalation, ground-level air immersion, and ground-surface irradiation exposure pathways.

The *Safe Drinking Water Act* (40 CFR § 141.66, “Maximum Contaminant Levels for Radionuclides”) states that average annual concentrations for beta- and gamma-emitting human-made radionuclides in drinking water shall not result in an annual dose equivalent greater than 4 mrem (0.04 mSv). It is important to note that these dose

equivalent limits are set for radionuclides released to the environment from DOE operations. These limits do not include but rather are exposures in addition to, doses from natural background radiation or medical procedures.

4.8.2 Background Radiation

There are several sources of natural radiation: cosmic and cosmogenic radiation (from outer space and the Earth's atmosphere), terrestrial radiation (from the Earth's crust), and internal radiation (naturally occurring radiation in our bodies, such as ^{40}K). The most common sources of terrestrial radiation are uranium and thorium and their decay products. Radon gas, a decay product of uranium, is a widely known naturally occurring terrestrial radionuclide. In addition to natural radioactivity, small amounts of radioactivity are present in the environment from aboveground nuclear weapons tests, the 1986 Chernobyl nuclear accident, and Technologically Enhanced Naturally Occurring Radioactive Material (TENORM) from the Permian Basin. Together, these sources of radiation are called background radiation.

Naturally occurring radiation in the environment can deliver both internal and external doses. Internal dose is received as a result of the intake of radionuclides through ingestion (consuming food or drink containing radionuclides) and inhalation (breathing radioactive particulates). External dose can occur from immersion in contaminated air or deposition of contaminants on surfaces. The average annual dose received by a member of the public from natural background radiation is approximately 300 mrem (3 mSv).

4.8.3 Dose from Air Emissions

The standard 40 CFR Part 191, Subpart A, provides limits regarding radiation doses to members of the public and the general environment from all sources (i.e., air, soil, water).

Compliance with Subpart A, "Standards" (40 CFR § 191.03[b]) and the NESHAP limit (40 CFR § 61.92) is determined by comparing annual radiation doses calculated for the maximally exposed individual (MEI) to the regulatory limits. As recommended by the EPA, computer modeling is used to calculate radiation doses to comply with the Subpart A and NESHAP limits. Compliance procedures for DOE facilities (40 CFR § 61.93[a]) require the use of CAP88-PC or AIRDOS-PC computer programs, or an approved equivalent, to calculate dose to members of the public.

Source term input for CAP88-PC for the CY was determined by radiochemical analyses of particulate samples collected from fixed air sampling filters at Stations B, C and G. Air filter samples were analyzed for ^{241}Am , $^{239/240}\text{Pu}$, ^{238}Pu , ^{90}Sr , $^{233/234}\text{U}$, ^{238}U , and ^{137}Cs because these radionuclides constitute over 98 percent of the dose potential from contact-handled and remote-handled TRU waste. A conservative dataset using the higher value of either the measured radionuclide concentration or 2σ TPU was used as input to the CAP88-PC computer program to calculate the EDEs to members of the public. See section 4.1.2 for more information on the results and discussion of the effluent monitoring data.

CAP88-PC dose calculations assume that exposed persons remain at the same point of exposure during the entire year and that the vegetables, milk, and meat consumed are locally produced. Thus, this dose calculation is a maximum potential dose resulting from WIPP facility operations, which includes doses from inhalation, immersion, deposition, and ingestion of radionuclides emitted via the air pathway from the WIPP facility.

4.8.4 Total Potential Dose from WIPP Operations

The radiation dose limits specified in 40 CFR Part 191, Subpart A, state that the combined annual dose equivalent to any member of the public in the general environment resulting from the discharges of radioactive material and direct radiation from management and storage shall not exceed limits of 25 mrem (0.25 mSv) to the whole body, and 75 mrem (0.75 mSv) to any critical organ. DOE Order 458.1 provides a public dose limit of 100 mrem/year total effective dose to any member of the public from DOE activities. The calculated effective dose equivalent from WIPP facility air emissions represents the total effective dose to a member of the public. The following sections discuss the potential dose equivalent through other pathways and the total potential dose equivalent a member of the public may have received from the WIPP facility during the CY. Section 4.8.4.3 discusses the potential dose equivalent received from radionuclides released to the air from the WIPP facility.

4.8.4.1 Potential Dose from Water Ingestion Pathway

The potential dose to individuals from the ingestion of WIPP facility-related radionuclides transported in water is determined to be zero for several reasons. Drinking water for communities near the WIPP facility comes from groundwater sources that are too remote to be affected by WIPP facility contaminants, based on current radionuclide transport scenarios summarized in *Title 40 CFR Part 191 Subparts B & C Compliance Certification Application for the Waste Isolation Pilot Plant* (DOE/CAO-96-2184). Water from the Culebra in the vicinity of the WIPP facility is naturally not potable due to high levels of total dissolved solids (TDS).

4.8.4.2 Potential Dose from Wild Game Ingestion

Game animals sampled during the CY were rabbit and quail. Potassium-40 was detected in all game samples. No measurable dose from WIPP facility-related radionuclides would have been received by any individual from this pathway during the CY.

4.8.4.3 Total Potential Dose from All Pathways

The only credible pathway from the WIPP facility to humans from operations this CY is through air emissions; therefore, this is the only pathway for calculating a potential dose. Table 4.1 summarizes the total atmospheric release and potential radiological dose at the WIPP facility in the CY for the limits in both 40 CFR §61.92 and 40 CFR §191.03(b).

Table 4.1 – WIPP Radiological Releases and Doses

WIPP Facility CY 2025 Radiological Air Emissions						
²³⁸Pu T _{1/2} = 8.78E+01 yr	^{239/240}Pu T _{1/2} = 2.41E+04 yr/ T _{1/2} = 6.57E+03 yr	²⁴¹Am T _{1/2} = 4.32E+02 yr	⁹⁰Sr T _{1/2} = 2.86E+01 yr	^{233/234}U T _{1/2} = 1.59E+05 yr/ T _{1/2} = 2.45E+05 yr	²³⁸U T _{1/2} = 4.47E+09 yr	¹³⁷Cs T _{1/2} = 3.02E+01 yr
4.630E-07 Ci	4.342E-07 Ci	5.600E-07 Ci	2.341E-06 Ci	5.865E-07 Ci	3.711E-07 Ci	1.609E-05 Ci
1.713E+04 Bq	1.606E+04 Bq	2.072E+04 Bq	8.663E+04 Bq	2.167E+04 Bq	1.373E+04 Bq	5.952E+05 Bq

WIPP Radiological Dose Reporting Table – MEI				
Pathway	EDE to Shaft #5 Office Worker MEI at 0.5 miles (812 m) WNW ⁴		Percent of EPA 10 mrem/yr limit to member of the public (%)	NOTE: The WIPP facility air emissions constitute the sole identified human pathway from current operations. The effective dose equivalent values represent the total effective dose from all radionuclides each contributing at least 10% of the potential total calculated dose to a member of the public. There were no other effluents or identified sources of human exposure from WIPP operations or external sources in CY 2025.
	(mrem/year)	(mSv/year)		
Air	7.48E-05	7.48E-07	7.48E-04	
Water	N/A ³	N/A	N/A	
Other Pathways	N/A	N/A	N/A	

WIPP Radiological Dose Reporting Table – Offsite Maximally Exposed Individual [40 CFR Part 61]							
Pathway	EDE to the Resident MEI at 8,850 m WNW		Percent of EPA 10 mrem/yr limit to member of the public (%)	Estimated population dose within 80 km		Population within 80 km ¹	Estimated natural radiation population dose ²
	(mrem/year)	(mSv/year)		(person-rem/year)	(person-Sv/year)		(person-rem/year)
Air	5.37E-06	5.37E-08	5.37E-05	3.44E-05	3.44E-07	115,770	34,731
Water	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other Pathways	N/A	N/A	N/A	N/A	N/A	N/A	N/A

WIPP Radiological Dose Reporting Table – Fence Line [40 CFR Part 191]						
Pathway	Dose equivalent to the whole body of the hypothetical receptor who resides year-round at WIPP fence line 652 m WNW		Percent of EPA 25 mrem/yr whole body limit (%)	Dose equivalent to the critical organ of the hypothetical receptor who resides year-round at WIPP fence line 652 m WNW		Percent of EPA 75-mrem/year critical organ limit
	(mrem/year)	(mSv/year)		(mrem/year)	(mSv/year)	
Air	9.12E-05	9.12E-07	3.65E-04	1.41E-03	1.41E-05	1.88E-03
Water	N/A	N/A	N/A	N/A	N/A	N/A
Other Pathways	N/A	N/A	N/A	N/A	N/A	N/A

Note. Total releases from combination of Stations B, C, and G. Values are calculated from sample activities plus 2σ TPU or the central value, whichever is greater, and divided by the ratio of sample flow to stack flow volumes.

1. Source: United States Census Bureau (2020 Census Data).
2. Estimated natural radiation population dose = (population within 80 km) $\times$ (300 mrem/year). Levels are consistent with the EPA map of natural radiation background in the United States using soil types typical of the Delaware Basin.
3. Not applicable at the WIPP facility.
4. The previous MEI at the SSCVS construction office was included in dose assessments and based on primary wind direction, the Shaft #5 construction office resulted in a higher dose than the SSCVS construction office.

In accordance with 40 CFR Part 191, Subpart A, the receptor selected is assumed to reside year-round at the EUA fence line in the northwest sector. For the CY, the dose to this hypothetical receptor was calculated to be $9.12\text{E-}05$ mrem/yr ($9.12\text{E-}07$ mSv/yr) for the whole body and $1.41\text{E-}03$ mrem/yr ($1.41\text{E-}05$ mSv/yr) to the critical organs. These values are less than the limits in 40 CFR § 191.03(b).

For the NESHAP standard (40 CFR § 61.92), the EDE potentially received by the offsite resident MEI in the CY, assumed to be residing 8.9 km (5.5 mi) west-northwest of the WIPP facility, is calculated to be $5.37\text{E-}06$ mrem/yr ($5.37\text{E-}08$ mSv/yr) for the whole body. This value is less than the 40 CFR § 61.92 limit.

For the NESHAP standard (40 CFR § 61.92), the EDE potentially received by the non-WIPP worker at the Shaft #5 construction office trailer MEI in the CY, assumed to be located 812 meters (0.5 mi) west-northwest of the WIPP facility, is calculated to be $7.48\text{E-}05$ mrem/yr ($7.48\text{E-}07$ mSv/yr) for the whole body. This value is less than the 40 CFR § 61.92 limit. The non-WIPP worker at the SSCVS was included in the dose assessment evaluations for the CY; however, the resulting dose at this location was lower than the dose at the Shaft #5 construction office and, thus, was not identified as the MEI for this CY.

As required by DOE Order 458.1, Administrative Chg. 4, the collective dose to the public within 80 km (50 mi) of the WIPP facility has been evaluated and is $3.44\text{E-}05$ person-rem/yr ($3.44\text{E-}07$ person-Sv/yr) in the CY.

4.8.5 Dose to Nonhuman Biota

Dose standards for populations of aquatic and terrestrial organisms are discussed in National Council on Radiation Protection and Measurements Report No. 109, *Effects of Ionizing Radiation on Aquatic Organisms* (NCRP, 1991), and the International Atomic Energy Agency (1992) Technical Report Series No. 332, *Effects of Ionizing Radiation on Plants and Animals at Levels Implied by Current Radiation Protection Standards*.

Those dose standards are:

- Aquatic animals – 10 milligrays per day (1 radiation absorbed dose per day)
- Terrestrial plants – 10 milligrays per day (1 radiation absorbed dose per day)
- Terrestrial animals – 1 milligrays per day (0.1 radiation absorbed dose per day)

The DOE has considered establishing these dose standards as limits for aquatic and terrestrial biota in proposed rule 10 CFR Part 834, "Radiation Protection of the Public

and the Environment,” but has delayed finalizing this rule until guidance for demonstrating compliance is developed. A *Graded Approach for Evaluating Radiation Doses to Aquatic and Terrestrial Biota* (DOE-STD-1153-2002) was developed to meet this need.

The radiation doses to nonhuman biota are reported in the ASER using DOE-STD-1153-2002, which requires an initial general screening using conservative assumptions. In the initial screen, biota concentration guides (BCG) are derived using conservative assumptions for various generic organisms. Maximum concentrations of radionuclides detected in soil, sediment, and water during environmental monitoring are divided by the BCG, and the results are summed for each organism. If the sum of these fractions is less than 1.0, the site is deemed to have passed the screen, and no further action is required. This screening evaluation is intended to provide a very conservative evaluation of the site about the recommended limits. This guidance was used to screen radionuclide concentrations observed around the WIPP during the CY using the maximum radionuclide concentrations listed in table 4.2, and the sum of fractions was less than 1.0 for all media. The element ^{40}K is not included in table 4.2 because it is a natural component of the Earth’s crust and is not part of WIPP-related radionuclides.

Table 4.2 – General Screening Results for Potential Radiation Dose to Nonhuman Biota from Radionuclide Concentrations in Surface Water (Bq/L), Sediment (Bq/g), and Soil (Bq/g)

Medium	Radionuclide	Maximum Detected Concentration	Location	BCG ¹	Concentration/B CG
Aquatic System Evaluation					
Sediment (Bq/g)	$^{233/234}\text{U}$	ND ²	UPR	2.00E+02	N/A ³
	^{235}U	ND ²	LST	1.00E+02	N/A ³
	^{238}U	ND ²	PCN	9.00E+01	N/A ³
	^{238}Pu	ND ²	N/A ³	2.00E+02	N/A ³
	$^{239/240}\text{Pu}$	ND ²	N/A ³	2.00E+02	N/A ³
	^{241}Am	ND ²	N/A ³	2.00E+02	N/A ³
	^{60}Co	ND ²	N/A ³	5.00E+01	N/A ³
	^{137}Cs	ND ²	HIL	1.00E+02	N/A ³
	^{90}Sr	ND ²	N/A ³	2.00E+01	N/A ³

Medium	Radionuclide	Maximum Detected Concentration	Location	BCG ¹	Concentration/B CG
Surface Water ⁴ (Bq/L)	^{233/234} U	1.99E-01	UPR	7.00E+00	2.84E-02
	²³⁵ U	6.53E-03	UPR	8.00E+00	8.16E-04
	²³⁸ U	1.53E-01	UPR	8.00E+00	1.91E-02
	²³⁸ Pu	ND ²	N/A ³	7.00E+00	N/A ³
	^{239/240} Pu	ND ²	N/A ³	7.00E+00	N/A ³
	²⁴¹ Am	ND ²	N/A ³	2.00E+01	N/A ³
	⁶⁰ Co	ND ²	N/A ³	1.00E+02	N/A ³
	¹³⁷ Cs	ND ²	N/A ³	2.00E+00	N/A ³
	⁹⁰ Sr	ND ²	N/A ³	1.00E+01	N/A ³
Sum of Fractions					4.84E-02
Terrestrial System Evaluation					
Soil (Bq/g)	^{233/234} U	1.91E-02	MLR 0–2 cm	2.00E+02	9.55E-05
	²³⁵ U	1.00E-03	MLR 0–2 cm	1.00E+02	1.00E-05
	²³⁸ U	1.64E-02	MLR 0–2 cm	6.00E+01	2.73E-04
	²³⁸ Pu	ND ²	N/A ³	2.00E+02	N/A ³
	^{239/240} Pu	ND ²	MLR 0–2 cm	2.00E+02	N/A ³
	²⁴¹ Am	ND ²	N/A ³	1.00E+02	N/A ³
	⁶⁰ Co	ND ²	N/A ³	3.00E+01	N/A ³
	¹³⁷ Cs	4.99E-03	MLR 0–2 cm	8.00E-01	6.24E-03
	⁹⁰ Sr	ND ²	N/A ³	8.00E-01	N/A ³

Medium	Radionuclide	Maximum Detected Concentration	Location	BCG ¹	Concentration/B CG
Terrestrial System Evaluation					
Surface Water (Bq/L)	^{233/234} U	1.99E-01	UPR	7.00E+00	2.84E-02
	²³⁵ U	6.53E-03	UPR	8.00E+00	8.16E-04
	²³⁸ U	1.53E-01	UPR	8.00E+00	1.91E-02
	²³⁸ Pu	ND ²	N/A ³	7.00E+00	N/A ³
	^{239/240} Pu	ND ²	N/A ³	7.00E+00	N/A ³
	²⁴¹ Am	ND ²	N/A ³	2.00E+01	N/A ³
	⁶⁰ Co	ND ²	N/A ³	1.00E+02	N/A ³
	¹³⁷ Cs	ND ²	N/A ³	2.00E+04	N/A ³
	⁹⁰ Sr	ND ²	N/A ³	2.00E+04	N/A ³
Sum of Fractions					4.87E-02

Note. Maximum detected concentrations were compared with BCG values to assess potential dose to biota. As long as the sum of the ratios between detected maximum concentrations and the associated BCG is below 1.0, no adverse effects on plant or animal populations are expected (DOE-STD-1153-2002).

1. The radionuclide concentration in the medium that would produce a radiation dose in the organism equal to the dose standard under the conservative assumptions in the model.
2. Not detected in any of the sampling locations for a given sample matrix.
3. Not applicable.
4. Sediment and surface water samples were assumed to be co-located.

4.8.6 Release of Property Containing Residual Radioactive Material

WIPP uses procedures to govern unconditionally releasing items. WIPP can release the item after it has a radiological survey if it meets specific documented limits. For items meeting unconditional release criteria, WIPP generates a form and performs multiple verifications to ensure compliance. These measures ensure that radiological material releases from WIPP are consistent with DOE Order 458.1 requirements. Compliance with these limits which are dose-based and are such that if any member of the public received any exposure, it would be less than 1 mrem/yr. There was no release of TRU radiologically contaminated materials or property from the WIPP facility in the CY.

4.9 RADIOLOGICAL PROGRAM CONCLUSIONS

4.9.1 Effluent Monitoring

For the CY, the calculated EDE to the receptor (hypothetical MEI) who resides year-round at the EUA fence line is 9.12E-05 mrem/yr (9.12E-07 mSv/yr) for the whole body and 1.41E-03 mrem/yr (1.41E-05 mSv/yr) for the critical organs. For the WIPP Effluent Monitoring Program, figure 4.14 and table 4.3 show the dose to the whole body for the hypothetical MEI from CY 2002 to this CY. Figure 4.15 and table 4.4 show the dose to the critical organs for the hypothetical MEI from CY 2002 to this CY. These dose equivalent values are below 25 mrem (0.25 mSv) to the whole body and 75 mrem (0.75 mSv) to any critical organ, in accordance with the limits in 40 CFR § 191.03(b).

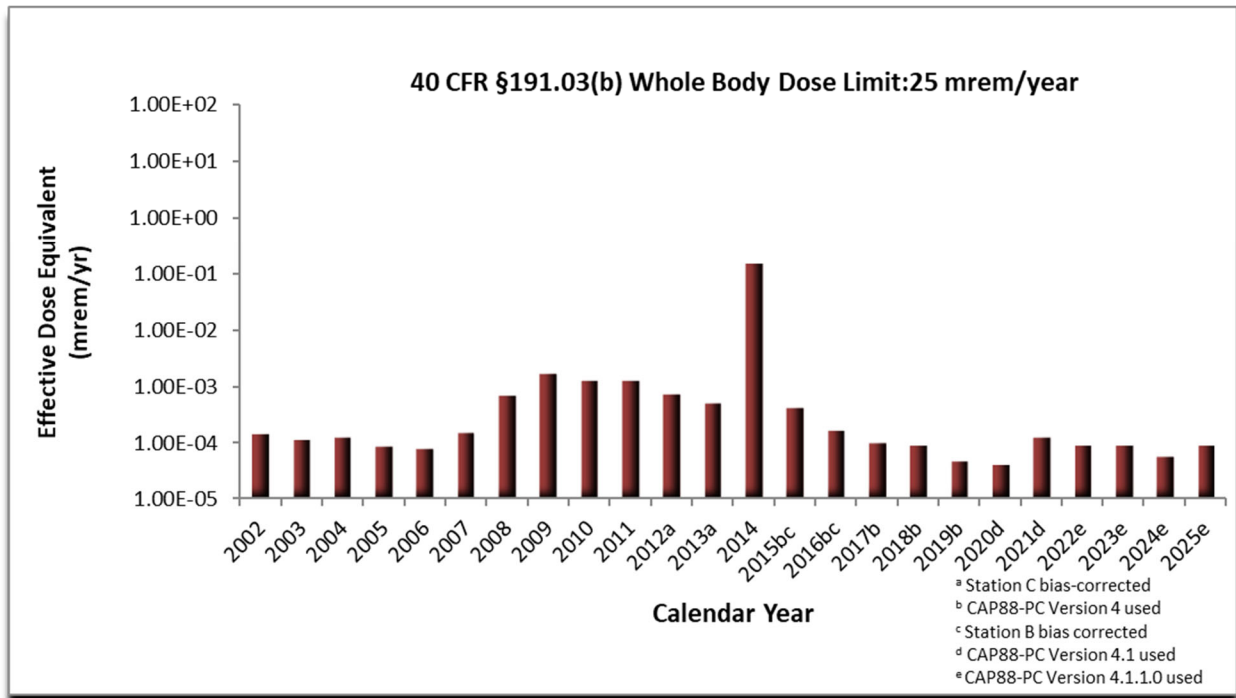


Figure 4.14 – Dose to the Whole Body for the Hypothetical Maximally Exposed Individual at the WIPP Fence Line

Table 4.3 – Comparison of Dose to the Whole Body to EPA Limit of 25 mrem/year per 40 CFR §191.03(b)

Year	Effective Dose Equivalent (mrem/yr)	Percentage of EPA Limit
2002	1.51E-04	0.00060%
2003	1.15E-04	0.00046%
2004	1.27E-04	0.00051%
2005	8.86E-05	0.00035%
2006	8.16E-05	0.00033%
2007	1.52E-04	0.00061%
2008	7.14E-04	0.00286%
2009	1.71E-03	0.00684%
2010	1.31E-03	0.00524%
2011	1.29E-03	0.00516%
2012 ^a	7.55E-04	0.00302%
2013 ^a	5.25E-04	0.00210%
2014	1.49E-01	0.59600%
2015 ^{b c}	4.23E-04	0.00169%
2016 ^{b c}	1.71E-04	0.00068%
2017 ^b	1.04E-04	0.00042%
2018 ^b	9.31E-05	0.00037%
2019 ^b	4.88E-05	0.00020%
2020 ^d	4.32E-05	0.00017%
2021 ^d	1.28E-04	0.00051%
2022 ^e	9.35E-05	0.00037%
2023 ^e	9.44E-05	0.00038%
2024 ^e	5.89E-05	0.00024%
2025 ^e	9.12E-05	0.00036%
40 CFR §191.03(b) Whole Body Limit	25	

a. Station C bias-corrected.

b. CAP88-PC Version 4 used.

c. Station B bias-corrected.

d. CAP88-PC Version 4.1 used.

e. CAP88-PC Version 4.1.1.0 used.

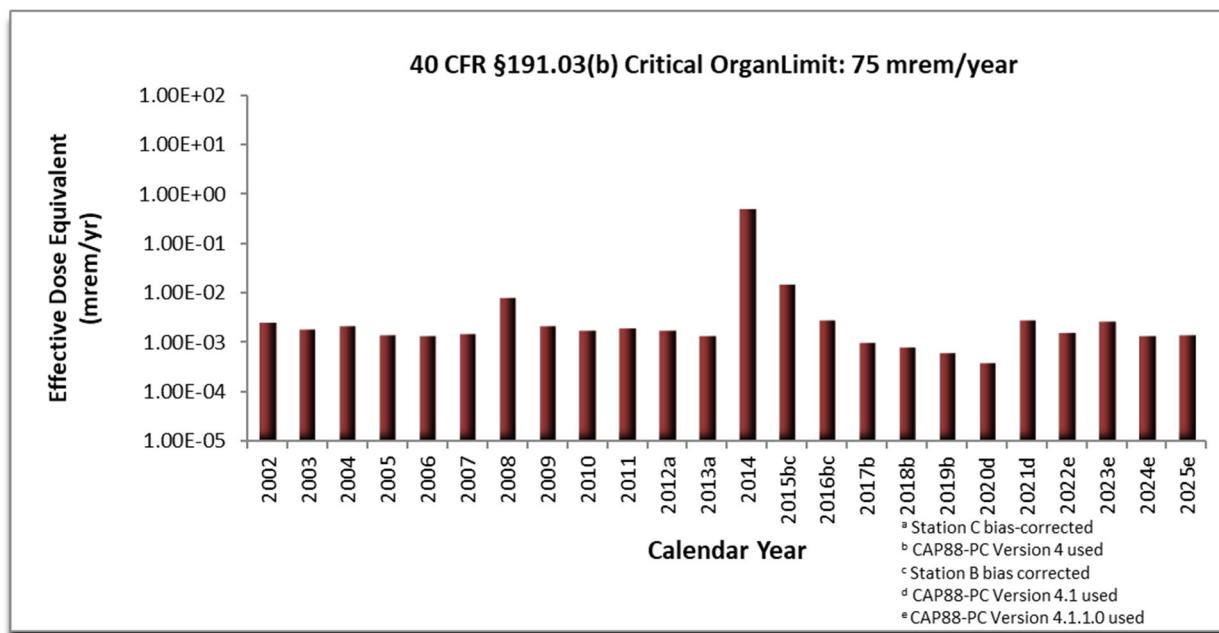


Figure 4.15 – Dose to the Critical Organ for Hypothetical Maximally Exposed Individual at the WIPP Fence Line

Table 4.4 – Comparison of Dose to the Critical Organ to EPA Limit of 75 mrem/year per 40 CFR §191.03(b)

Year	Effective Dose Equivalent (mrem/yr)	Percentage of EPA Limit
2002	2.46E-03	0.0033%
2003	1.85E-03	0.0025%
2004	2.11E-03	0.0028%
2005	1.41E-03	0.0019%
2006	1.30E-03	0.0017%
2007	1.46E-03	0.0019%
2008	7.81E-03	0.0104%
2009	2.10E-03	0.0028%
2010	1.73E-03	0.0023%
2011	1.86E-03	0.0025%
2012 ^a	1.75E-03	0.0023%
2013 ^a	1.31E-03	0.0017%
2014	4.80E-01	0.6400%
2015 ^{b c}	1.41E-02	0.0188%
2016 ^{b c}	2.79E-03	0.0037%
2017 ^b	9.87E-04	0.0013%
2018 ^b	7.82E-04	0.0010%
2019 ^b	6.18E-04	0.0008%
2020 ^d	3.74E-04	0.0005%
2021 ^d	2.78E-03	0.0037%
2022 ^e	1.56E-03	0.0021%
2023 ^e	2.61E-03	0.0035%
2024 ^e	1.31E-03	0.0017%
2025 ^e	1.41E-03	0.0019%
40 CFR §191.03(b) Critical Organ Limit	75	

a. Station C bias-corrected.

b. CAP88-PC Version 4 used.

c. Station B bias-corrected.

d. CAP88-PC Version 4.1 used.

e. CAP88-PC Version 4.1.1.0 used.

The calculated annual EDE to the non-WIPP worker at the Shaft #5 construction office trailer for this CY is $7.48\text{E-}05$ mrem ($7.48\text{E-}07$ mSv). The Shaft #5 construction office trailer is located 0.5 mi (812 m) west-northwest. For the WIPP Effluent Monitoring Program, figure 4.16 and table 4.5 show the EDE to the unbadged onsite worker MEI for the CY. These EDE values are more than four orders of magnitude below the EPA NESHAP limit of 10 mrem (0.1 mSv) per year, as specified in 40 CFR §61.92.

The non-WIPP business workspace identified as a construction office trailer at the nearest occupied point of the SSCVS project was considered in dose calculations for the CY. However, based on the default parameters in the CAP88-PC model for agricultural activities and the prevailing wind direction, the Shaft #5 construction office was selected as the receptor location. The dose for the Shaft #5 workspace is included in Addendum A to the Periodic Confirmatory Measurement Compliance Report for CY 2025. The calculated dose for the SSCVS workspace was less than that for the Shaft #5 workspace, and thus, is not the maximum receptor. Figure 4.16 and table 4.5 include the historical dose to the MEI (either the SSCVS or the Shaft #5 workspace) for the respective CY.

For the CY, the calculated annual EDE to the offsite resident MEI from normal operations conducted at the WIPP facility is $5.37\text{E-}06$ mrem ($5.37\text{E-}08$ mSv). For the WIPP Effluent Monitoring Program, figure 4.17 and table 4.6 show the EDE to the MEI from CY 2002 to this CY. These EDE values are more than five orders of magnitude below the EPA NESHAP limit of 10 mrem/yr (0.1 mSv/yr), as specified in 40 CFR §61.92.

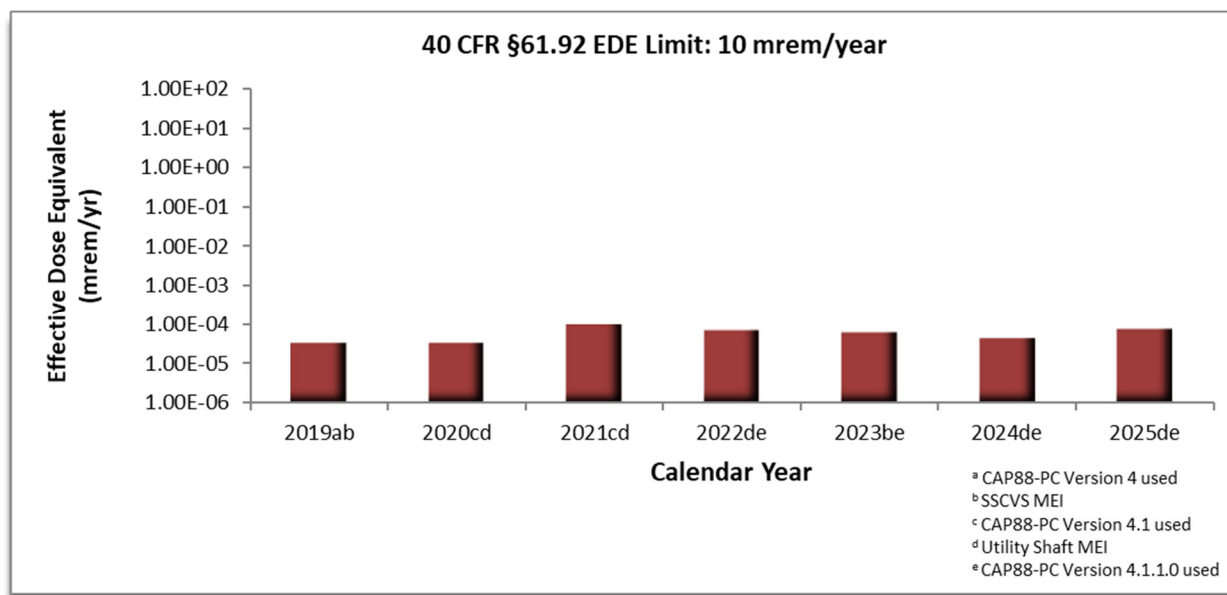


Figure 4.16 – WIPP Effective Dose Equivalent to the Maximally Exposed Individual

Table 4.5 – Comparison of EDEs to EPA Limit of 10 mrem/year per 40 CFR §61.92 (MEI)

Year	Effective Dose Equivalent (mrem/yr)	Percentage of EPA Limit
2019 ^{a b}	3.48E-05	0.000348%
2020 ^{c d}	3.43E-05	0.000342%
2021 ^{c d}	9.70E-05	0.000970%
2022 ^{d e}	7.20E-05	0.000720%
2023 ^{b e}	6.30E-05	0.000630%
2024 ^{d e}	4.51E-05	0.000451%
2025 ^{d e}	7.48E-05	0.000748%

- a. CAP88-PC Version 4 used.
- b. SSCVS MEI.
- c. CAP88-PC Version 4.1 used.
- d. Shaft #5 used.
- e. CAP88-PC Version 4.1.1.0 used.

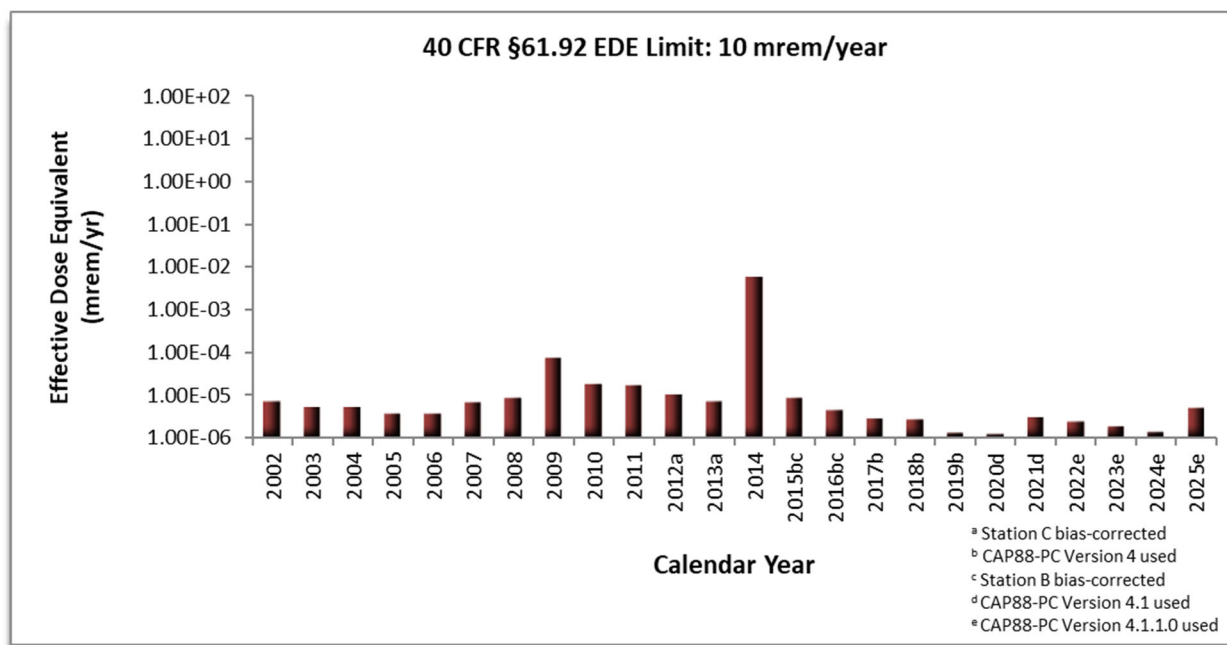
**Figure 4.17 – WIPP Effective Dose Equivalent to the Offsite Maximally Exposed Individual (i.e., individual resident member of the public)**

Table 4.6 – Comparison of EDEs to EPA Limit of 10 mrem/year per 40 CFR §61.92 (Offsite MEI)

Year	Effective Dose Equivalent (mrem/yr)	Percentage of EPA Limit
2002	7.61E-06	0.000076%
2003	5.43E-06	0.000054%
2004	5.69E-06	0.000057%
2005	3.85E-06	0.000039%
2006	3.93E-06	0.000039%
2007	7.01E-06	0.000070%
2008	9.05E-06	0.000091%
2009	7.80E-05	0.000780%
2010	1.91E-05	0.000191%
2011	1.75E-05	0.000175%
2012 ^a	1.06E-05	0.000106%
2013 ^a	7.39E-06	0.0000739%
2014	5.86E-03	0.058600%
2015 ^{b c}	8.98E-06	0.000090%
2016 ^{b c}	4.72E-06	0.000047%
2017 ^b	3.02E-06	0.000030%
2018 ^b	2.86E-06	0.000029%
2019 ^b	1.36E-06	0.000014%
2020 ^d	1.28E-06	0.000013%
2021 ^d	3.17E-06	0.000032%
2022 ^e	2.49E-06	0.000025%
2023 ^e	1.98E-06	0.000020%
2024 ^e	1.45E-06	0.000015%
2025 ^e	5.37E-06	0.000054%

a. Station C bias-corrected.

b. CAP88-PC Version 4 used.

c. Station B bias-corrected.

d. CAP88-PC Version 4.1 used.

e. CAP88-PC Version 4.1.1.0 used.

4.9.2 Environmental Monitoring

The radionuclide concentrations observed in environmental monitoring samples were extremely low and comparable to radiological baseline levels and to previous years' levels.

Environmental samples that contained the highest concentrations of radionuclides that were higher than (or equal to) the baseline concentrations included the following:

- Groundwater: For $^{233/234}\text{U}$, above the baseline concentration of $1.30\text{E}00\text{ Bq/L}$, was WQSP-1 at $1.35\text{E}00\text{ Bq/L}$. For ^{235}U , above the baseline concentration of $3.10\text{E}-02\text{ Bq/L}$, was WQSP-1 at $4.00\text{E}-02\text{ Bq/L}$.
- Soil: For $^{233/234}\text{U}$, above the baseline concentration of $8.60\text{E}-03\text{ Bq/g}$ was WEE 2–5 cm with $8.83\text{E}-03\text{ Bq/g}$. For ^{40}K , above the baseline concentration of $3.40\text{E}-01\text{ Bq/g}$ was MLR 5–10 cm at $3.53\text{E}-01\text{ Bq/g}$.
- Surface Water: For ^{238}U , above the baseline of $1.10\text{E}-01\text{ Bq/L}$, was UPR at $1.53\text{E}-01\text{ Bq/L}$.
- Air Filter Composites: For ^{40}K , above the baseline concentration of $3.20\text{E}-04\text{ Bq/m}^3$, were SEC Q1 at $6.63\text{E}-04\text{ Bq/m}^3$, SEC Q2 at $5.98\text{E}-04\text{ Bq/m}^3$, WSS Q1 at $5.78\text{E}-04\text{ Bq/m}^3$, and SOO Q1 at $7.35\text{E}-04\text{ Bq/m}^3$. For ^{60}Co , above the baseline concentration of $2.70\text{E}-05\text{ Bq/m}^3$ were SMR Q3 at $2.59\text{E}-04\text{ Bq/m}^3$ and SOO Q4 at $9.31\text{E}-04\text{ Bq/m}^3$.

No other groundwater, surface water, sediment, soil, vegetation, air filter composite, or fauna samples yielded concentrations of $^{233/234}\text{U}$, ^{238}U , and ^{40}K , which were higher than the baseline concentration. The concentrations higher than the baseline listed above are most likely due to natural spatial variability. At SEC, ^{40}K was detected above the baseline in Q1 and Q3 of 2025, but not in Q2 and Q4 of 2025, with no apparent trend. At WEE, ^{40}K was only detected above baseline in Q4 of 2025, with no apparent trend. The measurement of ^{60}Co above the baseline value has not been detected in previous years. A laboratory error is currently suspected. Simultaneous sampling by the NMED has shown no detections of ^{60}Co . Monitoring for ^{60}Co will continue. Duplicate samples taken in 2025 are available for further analysis if deemed necessary.

5.0 ENVIRONMENTAL NON-RADIOLOGICAL PROGRAM INFORMATION

Non-radiological programs at the WIPP facility include land management, meteorological monitoring, VOC monitoring, seismic monitoring, certain aspects of liquid effluent, and surface water and groundwater monitoring. The monitoring is performed to comply with Permit requirements and provisions of the WIPP authorization documents. Radiological and non-radiological groundwater monitoring are discussed in chapters 4 and 6, respectively.

5.1 PRINCIPAL FUNCTIONS OF NON-RADIOLOGICAL SAMPLING

The principal functions of the non-radiological environmental surveillance program are to:

- Assess the effect of the WIPP facility operations on human health.
- Assess the effect of the WIPP facility operations on the surrounding ecosystem.
- Monitor ecological conditions in the Los Medanos region.
- Provide data that have not been or will not be acquired by other programs but is important to the WIPP mission.
- Comply with applicable commitments (e.g., DOE/BLM Memorandum of Understanding and interagency agreements).

5.2 LAND MANAGEMENT PLAN

The LMP, available to the public on the WIPP Home Page, was developed as required by the WIPP LWA to identify resource values, promote multiple-use management, and establish long-term goals for the management of WIPP lands. It was developed in consultation with the BLM and the State of NM.

The LMP sets forth cooperative arrangements and protocols for addressing WIPP-related land management actions. The LMP is reviewed biennially to assess the adequacy and effectiveness of the document or as may be necessary to address emerging issues affecting WIPP lands. The LMP underwent review in 2025, with a reprint issued in January 2026.

5.2.1 Land Use Requests

Parties who wish to conduct activities that may impact lands under the jurisdiction of the DOE but outside the PPA (figure 1.1) are required by the LMP to prepare an LUR. An LUR consists of a narrative description of the project, a completed environmental compliance review, and a map depicting the location of the proposed activity. Documentation is used to determine if applicable regulatory requirements have been met prior to approval of a proposed project. An LUR is submitted to the Land Use Coordinator by organizations wishing to perform construction on rights-of-way, pipeline easements, or similar actions within the WLWA or on lands used in the operation of the

WIPP facility under the jurisdiction of the DOE. In the CY, two LURs were reviewed and approved.

5.2.2 Wildlife Population Monitoring

An updated list of threatened and endangered species for Eddy and Lea Counties, NM, was compiled from multiple sources in April 2025 and included in the updated LMP (see section 2.11 Endangered Species Act). This list includes federal and state-listed threatened and endangered species, and species under federal review.

Employees of the WIPP facility continue to consider resident species when planning activities that may impact wildlife or their habitat. The LMP details wildlife management objectives and provisions for hunting and trapping. Implementation of these objectives ensures that operations at the WIPP facility have little to no impact on wildlife.

Public hunting and trapping are permitted on WLWA lands outside the Property Protection Area, Off-Limits Area, and other posted no-trespass zones, in accordance with the LWA, the LMP, and applicable NMDGF and USFWS regulations. Approximately 85 percent of the 10,240-acre WLWA remains available for this use. Hunting and trapping are prohibited in posted areas, from or across the North and South Access Roads and their fenced rights-of-way, and off existing roads without Land Use Coordinator approval (including game retrieval). Recreational users must check in and out with WIPP Security at 575-234-8407.

DOE does not administer a WIPP-specific hunt program, issue site permits, or record hunter days or harvest on the WLWA. Seasons, bag limits, and licenses are set and enforced by NMDGF (big game, upland game, furbearers) and USFWS (migratory birds). Species that may be legally hunted on open portions of the WLWA during NMDGF/USFWS seasons include mule deer, javelina, scaled and other quail, dove and other migratory game birds, and furbearers, subject to current state and federal rules. NMDGF harvest statistics are published at the Game Management Unit or county scale and are not available for the WLWA specifically. Reporting-year documented take on WIPP lands was therefore not collected and is not available.

WIPP continues to sample selected game species (e.g., quail, rabbit, mule deer, javelina) under NMDGF authorization for radiological analysis; those results are reported in the biotic monitoring / dose assessment sections of this ASER and are not a hunter-harvest census.

Implementation of specific best management practices are also utilized to monitor and protect wildlife. For example, best management practices for mowing access road rights-of-way have been developed. They are utilized to support compliance with the DOE's Pollinator Protection Plan, which is part of a national strategy to protect pollinators and enhance their habitats. As previously mentioned in chapter 2, section 2.12, best management practices are utilized to protect migratory birds found nesting on an artificial nesting platform near a groundwater monitoring well.

5.2.3 Reclamation of Disturbed Lands

Reclamation mitigates the effects of WIPP-related activities on affected plant and animal communities and ensures that the effects are not permanent. The objective of the reclamation program is to restore lands used in the operation of the WIPP facility that are no longer needed for those activities by achieving short-term stability that sets a course for eventual ecosystem restoration through natural processes. Reclamation is intended to reduce soil erosion, increase the rate of natural plant colonization and succession, provide habitat for wildlife in disturbed areas, and comply with land use reclamation commitments.

Reclamation includes controlling invasive non-native plants and noxious weeds. Executive Order 13751, *Safeguarding the Nation from the Impacts of Invasive Species*, calls on federal agencies to prevent the introduction, establishment, and spread of invasive species, and eradicate and control populations of established invasive species. In addition, right-of-way grants typically require control of noxious weeds. The primary invasive plant at the WIPP site and on DOE rights-of-way is *Peganum harmala*, commonly known as African rue. Noxious weed management objectives have been established in the LMP to address control of this noxious weed at the WIPP site and on rights-of-ways.

The DOE follows a reclamation program and a long-range reclamation plan in accordance with the LMP and specified right-of-way permit conditions. As locations are identified for reclamation, WIPP personnel reclaim these areas by using the best acceptable reclamation practices. Seed mixes used reflect those species indigenous to the area, with priority given to those plant species that are conducive to soil stabilization, wildlife, and livestock needs. For the CY, no reclamations were completed.

5.2.4 Oil and Gas Surveillance

Oil and gas activities within 1.6 km (1 mi) of the LWB are routinely monitored in accordance with the LMP to identify new activities associated with oil and gas exploration and production, including the following:

- Survey staking
- Surface geophysical exploration
- Drilling
- Pipeline construction
- Work-overs
- Changes in well status
- Anomalous occurrences (e.g., leaks, spills, accidents, noxious weeds, litter, non-compliances)

During the CY, WIPP surveillance teams conducted monthly surveillance and field inspections. Oil and gas industry traffic remained high near the WLWA and rights-of-way. Consequently, land management measures were utilized to ensure objectives were met for minimal environmental impact on WIPP properties. These measures included monitoring for illegal dumping and off-road travel. High-risk areas were identified, and signs and barricades were maintained in several areas to control access.

The oil and gas industry traffic resulted in many abandoned tires and debris on WIPP access roads. This material was removed by WIPP personnel and properly discarded or recycled if possible.

Pursuant to NM 1998 Noxious Weed Management Act (NMSA 1978, §§ 76-7D-1 to 76-7D-6), the NMDA designates noxious weeds targeted for control. In the CY, there were no herbicide applications for noxious weeds. Nevertheless, other management strategies and monitoring were continued on WIPP lands. Noxious weed management strategies are detailed in the LMP.

Proposed new well locations staked within 1.6 km (1 mi) of the LWB are field verified. This ensures that the proposed location is sufficiently far from the LWB to protect the WLWA from potential surface and subsurface trespass. Data from a public database maintained by the State of NM indicated that many new oil wells were spudded during the CY within 1.6 km (1 mi) of the LWB. The Delaware Basin Drilling Surveillance Program tracks new wells and updates in status of existing wells.

5.3 METEOROLOGICAL MONITORING

Meteorological monitoring data are collected through an array of instrumentation installed on and near a tower located at the WIPP site. Total precipitation for the CY was 310.13 mm (12.21 in) compared to 48.51 mm (1.91 in) for 2024. The average yearly rainfall recorded since 1997 is 338.84 mm (13.34 in). Figure 5.1 and table 5.1 show the monthly precipitation at the WIPP site for 2025.

The maximum recorded temperature (10-m level) in the CY was 34.58 °C (94.24 °F) in April, whereas the lowest temperature recorded was -14.11 °C (6.60 °F) in January. Monthly temperatures are illustrated in figures and tables 5.2, 5.3, and 5.4. Data for May through November are missing due to instrument failure. The met Tower failure occurred sometime between April 2nd and the 8th; this was due to rather significant windstorms through the areas of Eddy and Lea counties. An action request was filed on April 24th to replace equipment. We began getting data again in November 2025.

The average temperature for the months of available data was 12.28 °C (54.10 °F), which is 7.29 °C (13.13 °F) cooler than the 2024 average of 19.57 °C (67.23 °F). Due to the missing data, there is a large difference in average temperature. Using the same months as data is available in 2025, the average for 2024 is 12.58 °C (54.64 °F) a difference of 0.30 °C. The average monthly temperatures ranged from 26.35 °C (79.43 °F) during April to 15.03 °C (59.05 °F) in January (figure 5.3).

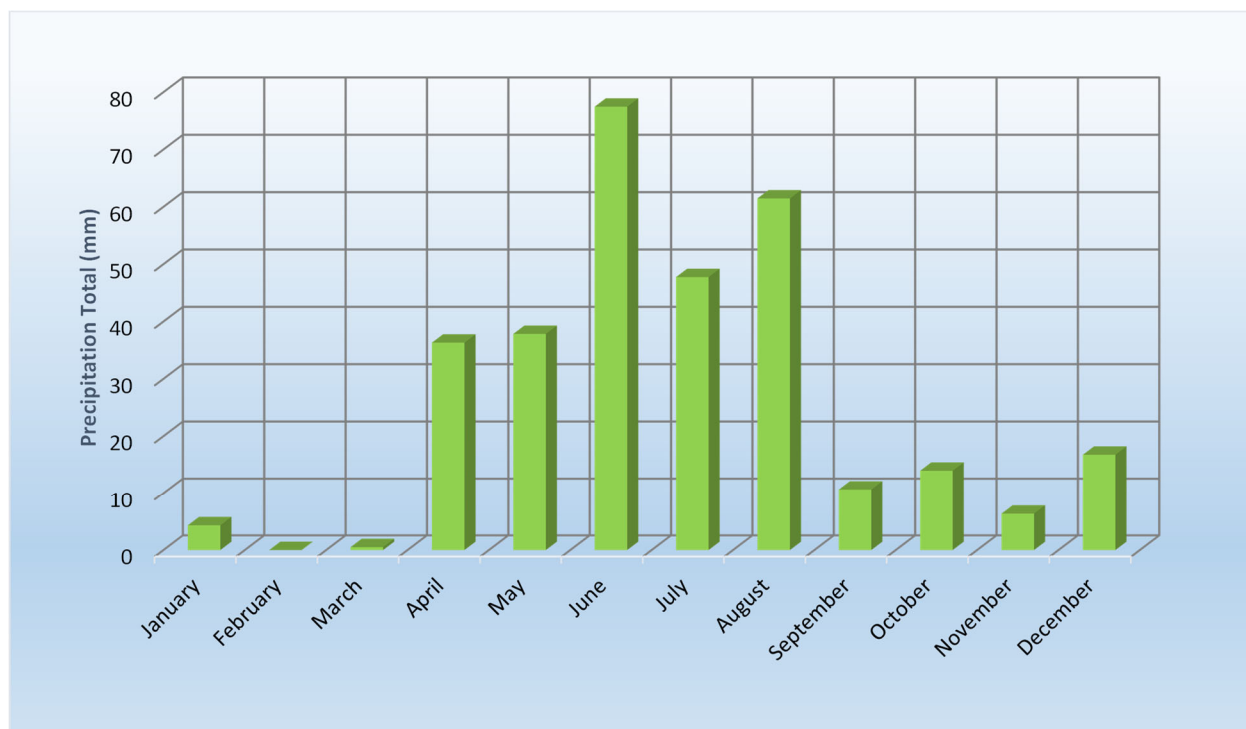


Figure 5.1 – Precipitation Monthly Totals for 2025

Table 5.1 – Precipitation Monthly Totals for 2025

Month	Total (mm)	Total (inch)
January	4.32	0.17
February	0.00	0.00
March	0.00	0.00
April	36.32	1.43
May	37.84	1.49
June	77.47	3.05
July	47.75	1.88
August	61.47	2.42
September	10.67	0.42
October	13.97	0.55
November	3.56	0.14
December	16.76	0.66

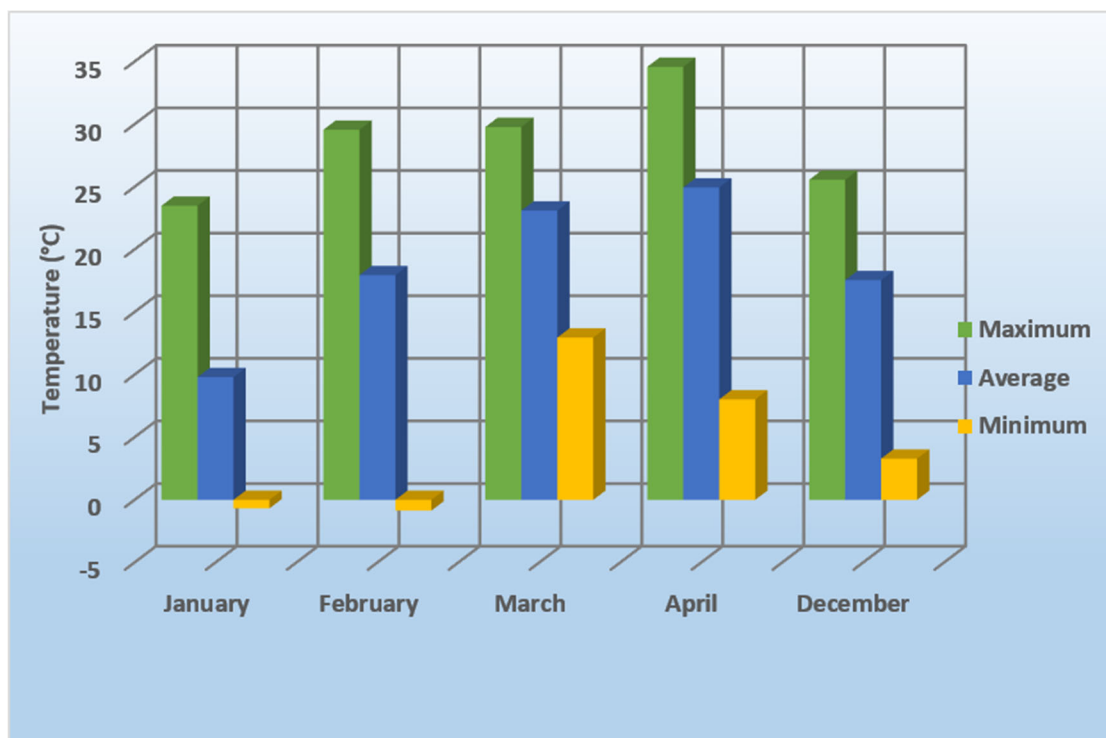


Figure 5.2 – High Temperatures (°C) for 2025

Table 5.2 – High Temperatures (°C) for 2025

Month	Maximum High	Average High	Minimum High
January	23.49	9.8	-0.68
February	29.56	17.95	-0.86
March	29.78	23.1	12.96
April	34.58	24.95	8.02
December	25.56	17.55	3.29

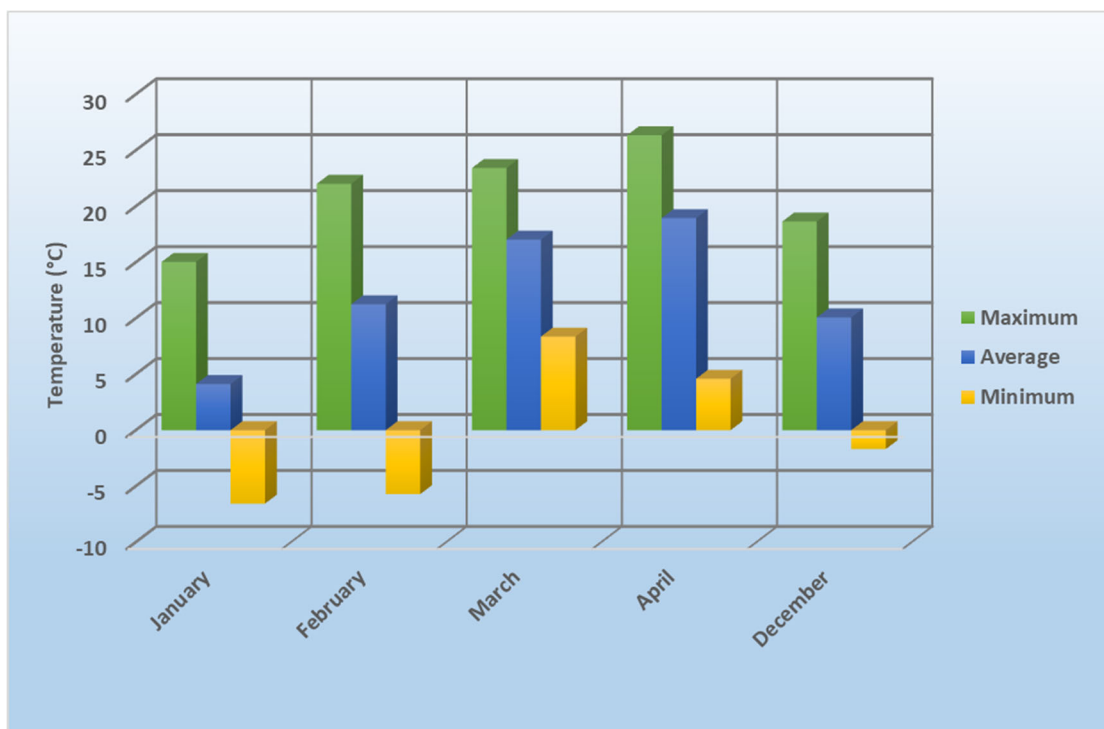


Figure 5.3 – Average Temperatures (°C) for 2025

Table 5.3 – Average Temperatures (°C) for 2025

Month	Maximum Average	Average	Minimum Average
January	15.03	4.12	-6.56
February	22.01	11.25	-5.71
March	23.42	17.02	8.36
April	26.35	18.94	4.59
December	18.64	10.07	-1.69

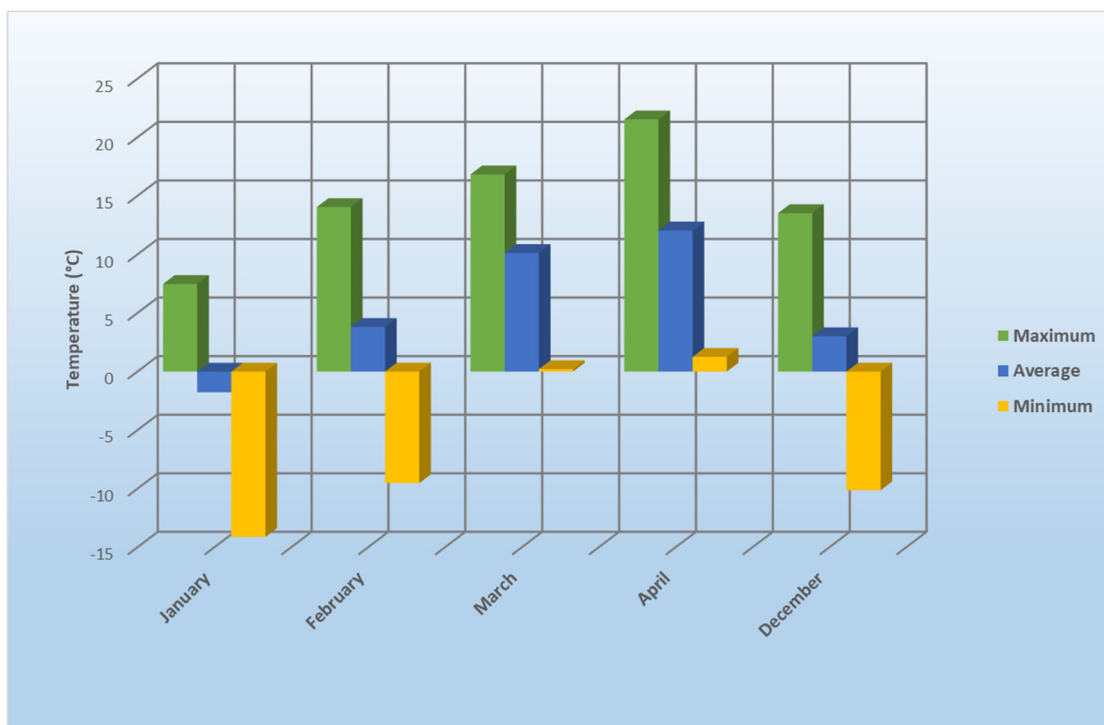


Figure 5.4 – Low Temperatures (°C) for 2025

Table 5.4 – Low Temperatures (°C) for 2025

Month	Maximum Low	Average Low	Minimum Low
January	7.48	-1.76	-14.11
February	14.05	3.81	-9.52
March	16.84	10.13	0.21
April	21.53	12.05	1.26
December	13.53	3.02	-10.13

5.3.1 Wind Direction and Wind Speed

Winds in the WIPP area are predominantly from the southeast. Winds of 3.71 to 6.30 meters per second (m/s) (8.30 to 14.09 miles per hour) were the most prevalent in this reporting period, occurring approximately 34.13 percent of the time (measured at the 10-meter level). Figure 5.5 shows percent by wind direction and summarizes the annual wind data for the CY.

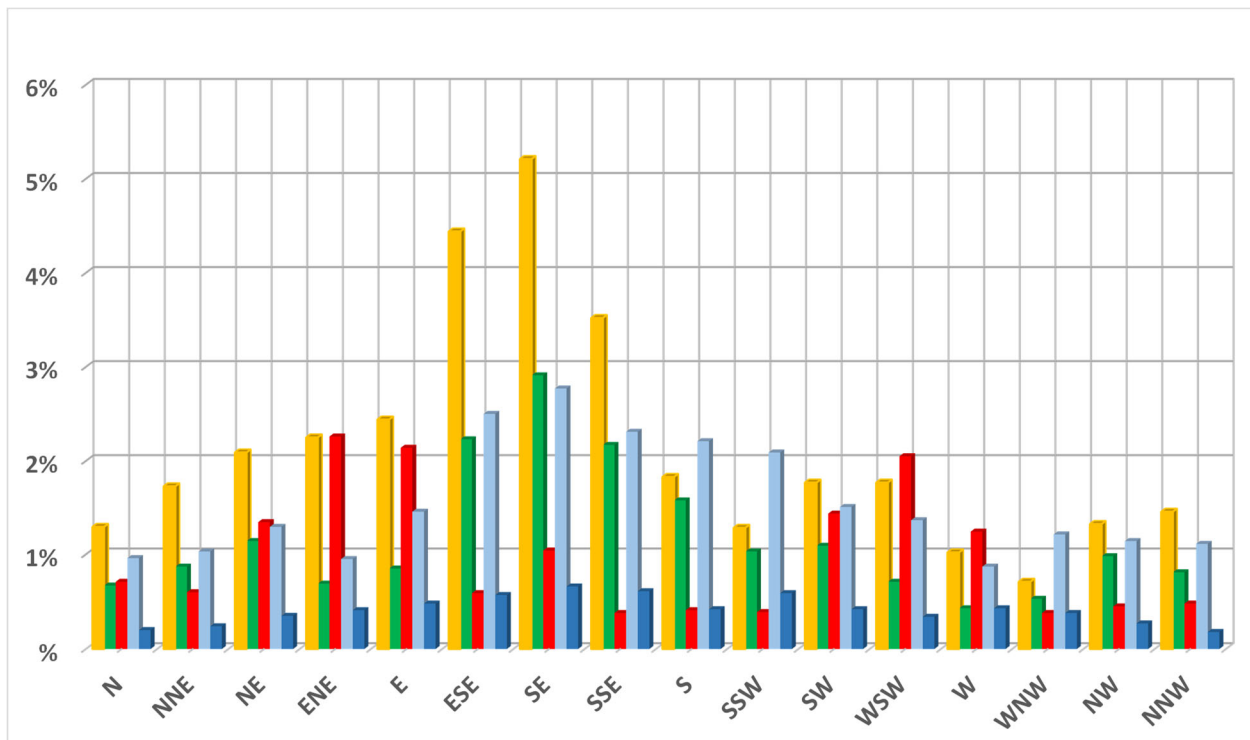
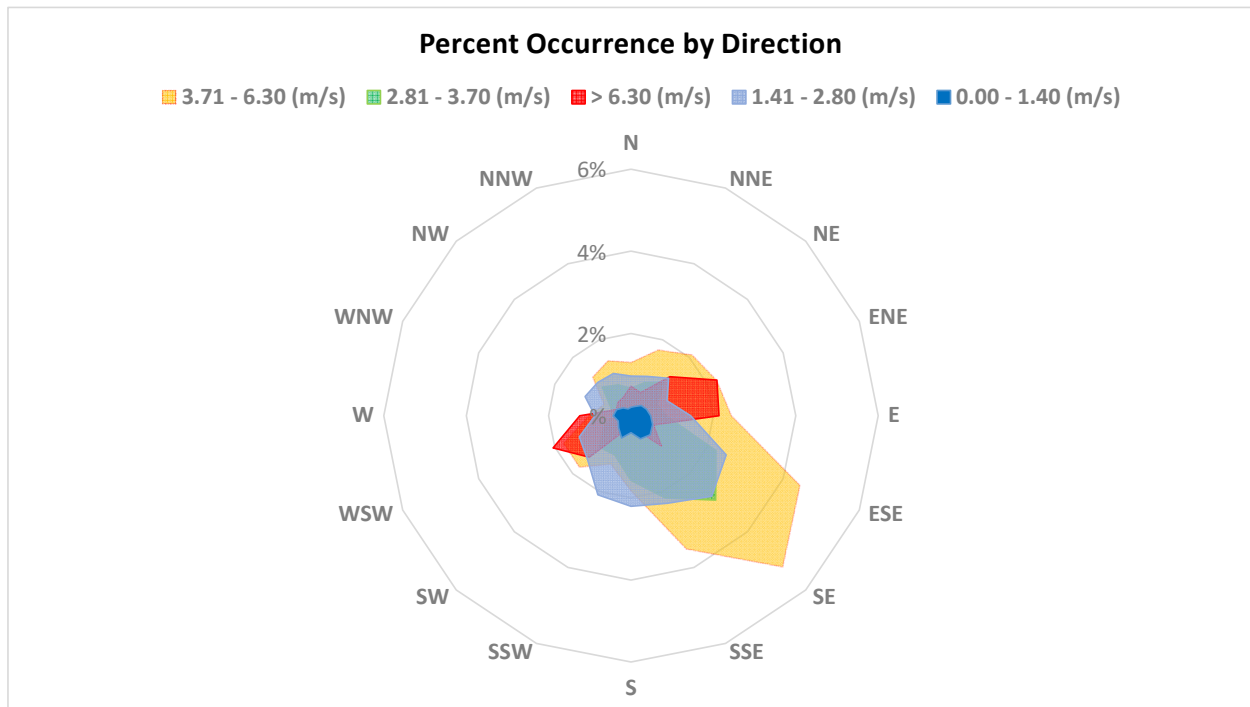


Figure 5.5 – WIPP Site Wind Speed and Direction (at 10-Meter Level)

The wind rose in figure 5.5 shows which direction the wind originated from and the length of the color represents how often (percent of the time) the wind blew from that

direction. The data represented in the graph is based on 15-minute averages recorded from the 10-meter sensor. The colors represent the different wind speed groups in m/s. The longest color shows wind speeds from the SE at 3.71 to 6.30 m/s, 5.21 percent of the time. In table 5.5 the colors indicate distinct categories of wind speed, while the intensity or opacity of each color reflects the specific range within those categories.

Table 5.5 – WIPP Site Wind Speed and Direction (at 10-Meter Level)

Wind Direction	0.00 - 1.40 (m/s)	1.41 - 2.80 (m/s)	2.81 - 3.70 (m/s)	3.71 - 6.30 (m/s)	> 6.30 (m/s)	Total Percent Occurrence by Direction
N	0.20	0.96	0.67	1.29	0.71	3.83
NNE	0.24	1.03	0.87	1.73	0.60	4.46
NE	0.35	1.29	1.14	2.09	1.34	6.21
ENE	0.41	0.95	0.69	2.25	2.26	6.57
E	0.48	1.45	0.85	2.44	2.14	7.36
ESE	0.57	2.50	2.23	4.44	0.59	10.32
SE	0.66	2.77	2.91	5.21	1.04	12.59
SSE	0.61	2.31	2.17	3.52	0.38	8.99
S	0.42	2.21	1.58	1.83	0.41	6.46
SSW	0.59	2.09	1.03	1.28	0.39	5.38
SW	0.42	1.50	1.09	1.77	1.43	6.22
WSW	0.34	1.36	0.71	1.77	2.05	6.23
W	0.43	0.87	0.43	1.02	1.24	3.99
WNW	0.38	1.21	0.53	0.71	0.38	3.21
NW	0.27	1.14	0.98	1.32	0.45	4.14
NNW	0.18	1.11	0.81	1.45	0.48	4.03
Totals:	6.56%	24.75%	18.68%	34.13%	15.88%	100.00%

5.4 VOLATILE ORGANIC COMPOUND MONITORING

Implementation of WP 12-VC.01, *Volatile Organic Compound Monitoring Plan*, ensures the Permittees closely monitor VOC emissions associated with the TRU mixed waste disposed of in the WIPP repository. There are two Permit-required, concurrent VOC monitoring programs implemented for the WIPP facility. These are the Repository VOC Monitoring Program (RVMP) (surface-based VOC monitoring) and the Disposal Room VOC Monitoring Program (DRVMP) (underground-based VOC monitoring).

Requirements for both programs are in Permit Part 4, Geologic Repository Disposal, and in Permit Attachment N, Volatile Organic Compound Monitoring Plan. The 10 target analytes (target VOCs) required for monitoring and respective limits and risk-based

action levels are in Permit Part 4, Section 4.4, Volatile Organic Compound Limits, and in Permit Part 4, Section 4.6.2, Repository Volatile Organic Compound Monitoring.

The RVMP is designed to measure airborne VOC concentrations to which non-waste-handling surface workers and members of the public living outside the WIPP site boundary could be exposed. The RVMP provides the Permittees with the data necessary to determine if VOCs exceed the action levels specified in the Permit. The target analytes are known components to the TRU mixed waste emplaced in the underground. As identified in Permit Attachment N, Section N-2, these target analytes were selected because together they represent approximately 99 percent of the carcinogenic risk due to air emissions of VOCs. The RVMP is also used to determine compliance with the panel closure standards in Permit Part 6, Section 6.10.1, and Permit Attachment G, Section G-1e(1). Post-closure monitoring is performed to demonstrate compliance with the environmental performance standards applicable to members of the public, including the nearest resident beyond the WIPP site boundary.

The Permit-required RVMP locations are Station VOC-C, located on the west side of Building 489—and a background data location, Station VOC-D, as shown in figure M-78 of Permit Attachment M. Sampling frequency for repository VOC monitoring occurs twice per week for the two air-sampling locations, in accordance with Permit Attachment N, Section N-3d(1).

For this reporting period, 237 original samples were collected from Stations VOC-C and VOC-D, along with 27 field duplicate samples used to assess field-sampling precision. Original sample results (when above the method reporting limit) from Station VOC-D are subtracted from Station VOC-C. This provides the emission value concentrations used in calculating total non-carcinogenic and carcinogenic risk for each sampling event. Data evaluation and reporting is per Permit Attachment N, Section N-3e(1), which includes calculating a running annual average. The Permittees determined that the risk has remained below action limits listed in Permit Part 4, Section 4.6.2.3, for the RVMP. Summary results for the maximum individual and running annual averages for carcinogenic risk and HI are presented in table 5.6a. Non-carcinogenic risk values for chloroform and 1,1-dichloroethylene were revised in the Permit in October 2025 and applied to results for the CY.

Table 5.6a – Maximum Individual Sample Results and Maximum Running Annual Averages for Carcinogenic Risk and Hazard Index (Non-Carcinogenic)

Maximums	Carcinogenic Risk (unitless)	Non-Cancer Hazard Index (unitless)
Action Levels	1.0E-05	1.0
Maximum Individual Sample Results	1.86E-06 (2/12/2025)	2.49E-01 (2/12/2025)
Maximum Running Annual Average	2.93E-07 (7/10/2025)	4.43E-02 (7/3/2025)

The DRVMP is designed to measure airborne VOC concentrations within disposal rooms of open/active panels and provides the Permittees with the data necessary to determine if airborne VOC concentrations exceed the limits identified in the Permit. The Permittees compare the measured concentrations of target analytes to the room-based limits and action levels listed in Permit Part 4, Sections 4.4.1 and 4.6.3.2, respectively. For this reporting period, 204 total original samples were collected for the DRVMP, which includes 13 field duplicates. All DRVMP samples were collected from Panel 8 in Rooms 3 (exhaust only), 4, 5, 6, and 7.

The DRVMP sampling in open panels occurs once every two weeks, unless the need to increase the frequency to weekly occurs in accordance with Permit Section 4.6.3.3. For this reporting period, the DRVMP sampling was performed once every two weeks.

Panel 8 disposal room VOC monitoring results conclude that the risk to the waste handling worker remains well below the 50 and 95 percent action levels for any VOC constituent of concern in any closed rooms or active open and immediately adjacent closed room. Summary results for the maximum reported values are presented in table 5.6b and location data is identified by room number, and intake (I) or exhaust (E) function.

Table 5.6b – Panel 8 Disposal Room VOC Monitoring Program Maximum Results

Target Analyte	Maximum Detected Value			Action Level (ppmv)		Room Based Limits (ppmv)
	Result (ppmv)	Location	Date	50%	95%	
Carbon tetrachloride	6.100	6E	2/10/2025	1,604	3,047	3,208
Chlorobenzene	0.0012 J	7E	12/8/2025 11/10/2025 11/25/2025	6,500	12,350	13,000
Chloroform	0.33	6E	2/10/2025	1,655	3,144	3,310
1,1-Dichloroethylene	0.0243	6E	2/10/2025	915	1,738	1,830
1,2-Dichloroethane	0.0063 J	7E	2/10/2025	400	760	800
Methylene chloride	0.34	7E	2/10/2025	16,665	31,665	33,333
1,1,2,2-Tetrachloroethane	0.0001 J	5I	3/10/2025	493	936	986
Toluene	0.10	7E	2/10/2025	4,011	7,621	8,023
1,1,1-Trichloroethane	2.08	6E	2/10/2025	5,616	10,671	11,233
Trichloroethylene	4.52	6E	2/10/2025	8,000	15,200	16,000

Notes. ppmv = parts per million by volume; J = estimated value; E = exhaust side of disposal room (sample location); I = intake side of disposal room (sample location).

The analytical data presented in this section is further detailed in the *Semi-Annual Volatile Organic Compound Data Summary Report for the Reporting Period January 1 to June 30, 2025* (DOE-WIPP-25-3612.0) and the *Semi-Annual Volatile Organic Compound Data Summary Report for the Reporting Period July 1 to December 31, 2025* (DOE-WIPP-26-3611.0). All samples were analyzed using gas chromatography/mass spectrometry (GC/MS) under an established QA/QC program and based on the guidance included in EPA Compendium Method TO-15, Determination of VOCs in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS) (EPA, 1999).

5.5 SEISMIC ACTIVITY

Currently, seismicity within 300 km (186 mi) of the WIPP site within the Delaware Basin is being monitored using United States Geological Survey (USGS). The reporting period for this report is from January 1, 2025, to December 31, 2025. The USGS collects information using their own network of seismographs as well as seismographs from New Mexico Institute of Mining and Technology (NMIMT) (figure 5.6). A network of 25 seismograph stations continuously monitors the seismographic activity occurring in southeast New Mexico.

During the reporting period, 4,691 seismic events were located with 300 km (185 mi) of the WIPP site in the Delaware Basin; 297 had magnitudes greater than 2.5. Recorded data included origin times, epicenter coordinates, and magnitudes. This number of

events cannot be directly compared to ASERs prior to 2022 because a new methodology was used that located events more accurately but excluded extremely small indeterminate events. Comparing similar datasets, this region's detected events remained approximately constant from 2022. The strongest recorded event with a magnitude of 5.4 occurred on May 4, 2025; this event was approximately 102.2 km (63.5 mi) southwest of the WIPP site in Culberson County, Texas. The seismic event closest to the site during the reporting period occurred approximately 31.9 km (19.8 mi) west of the WIPP site and had a magnitude of 2.8 in Eddy County, New Mexico.

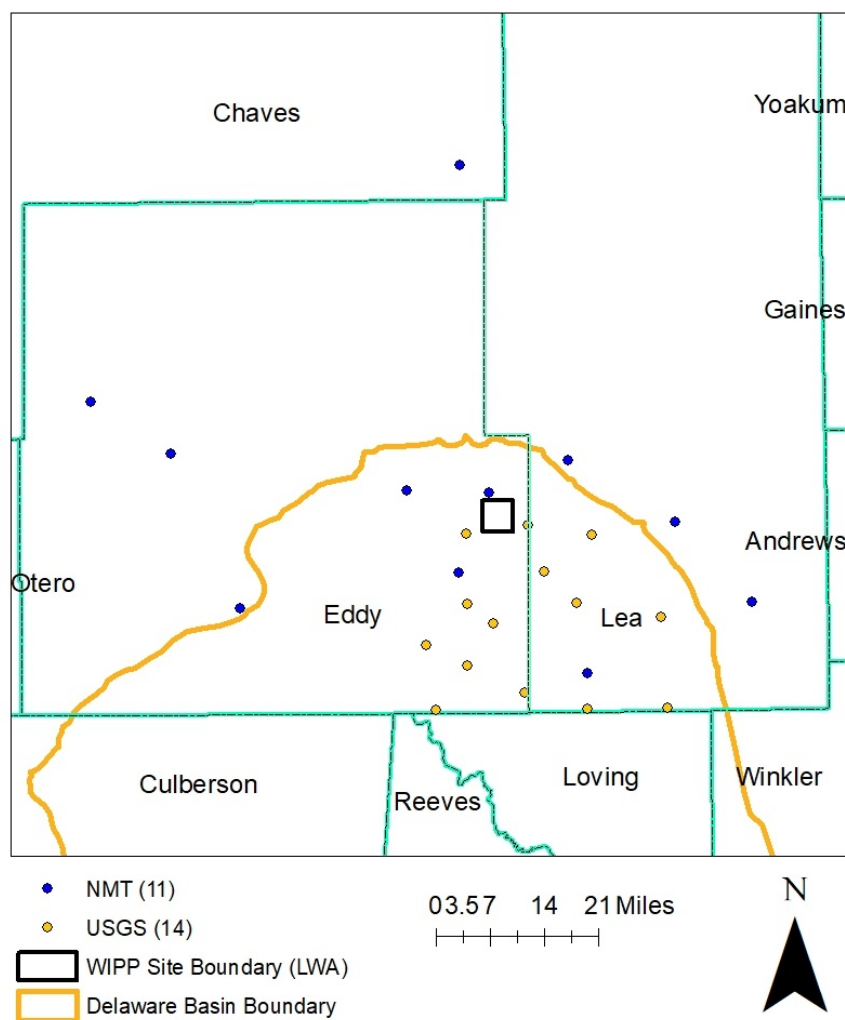


Figure 5.6 – Seismograph Station Locations in the Vicinity of the WIPP Site

Note: DOE/WIPP-25-2308.0. 2026. Waste Isolation Pilot Plant Delaware Basin Monitoring Annual Report. February 2026. Waste Isolation Pilot Plant, Carlsbad, NM.

5.6 LIQUID EFFLUENT MONITORING

The NMED Ground and Surface Water Protection regulations outlined 20.6.2 NMAC regulate discharges that could impact surface water or groundwater. The DOE's compliance with these regulations is discussed in chapter 2.

On February 4, 2025, an unplanned, non-routine, non-radiological discharge of sewage water occurred due a clogged line forcing sewage water up and through a manhole cover. An estimated volume of 10,000 gallons of raw sewage water, containing no large, suspended particles, was released to the ground, over an estimated time of 24 hours. The release was found during the daily Facility Operations inspection. Immediate actions included shutting off domestic water, closing restrooms, staging porta-potties, and pumping the manhole to Settling Lagoon 1. DOE notified the NMED Ground Water Quality Bureau verbally on February 4, 2025, and in writing on February 11, 2025, as required by DP-831, Condition 70. Corrective actions were planned and performed under DP-831, as required. The sewage line was cleared, and periodic flushing is now performed to prevent further recurrence. No further action is planned.

DP-831 Effluent Lagoons B and C were not sampled during 2025 since there was no industrial wastewater discharge to either lagoon. Salt Storage Ponds 1–3 and 5, and Stormwater Ponds 1–3 were sampled as there was a rain event of 2 inches or greater within a 24-hour period on June 9, 2025.

DP-831 Brine Retention Ponds East and West were not sampled because the SRB was not operational during this reporting period. Analytical data from the discharge monitoring reports for Effluent Lagoon A, Evaporation Pond H-19, Stormwater Ponds 1-3, and the Salt Storage Ponds 1-3 & 5 are summarized in table 5.7.

Table 5.7 – Effluent Lagoon A, Evaporation Pond H-19, Stormwater Ponds 1-3, and the Salt Storage Ponds 1-3 & 5 Analytical Results for 2025

Location and Sampling Period	NO ₃ -N (mg/L)	TKN (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)
Effluent Lagoon A - Spring	ND	117	3,420	197	1,520
Evaporation Pond H-19 - Spring	NA	NA	478,000	542	269,000
Effluent Lagoon A - Fall	ND	39	2,170	151	812
Evaporation Pond H-19 - Fall	NA	NA	NS	NS	NS
Stormwater Pond 1 - Spring	NA	NA	12,300	18.7	43.3
Stormwater Pond 2 - Spring	NA	NA	10,400	32.7	74.2
Stormwater Pond 3 - Spring	NA	NA	584	35.6	285
Salt Storage Pond 1 - Spring	NA	NA	28,800	372	16,800
Salt Storage Pond 2 - Spring	NA	NA	338,000	16,600	190,000
Salt Storage Pond 3 - Spring	NA	NA	349,000	26,200	191,000
Salt Storage Pond 5 - Spring	NA	NA	359,000	29,200	180,000

Brine Salt Storage Pond 4 - Fall	NA	NA	209	15.4	49.8
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Notes.NO₃-N = Nitrate-Nitrogen

mg/L = milligrams per liter.

NA = not applicable; analysis not required by DP-831.

ND = non-detect.

NS = not sampled (due to pond/lagoon being dry or no rainfall event over 2 inches in 24 hours).

6.0 SITE HYDROLOGY, GROUNDWATER MONITORING, AND PUBLIC DRINKING WATER PROTECTION

Current groundwater monitoring activities near the WIPP facility are outlined in the *WIPP Groundwater Monitoring Program Plan* (WP 02-1). In addition, the MOC has detailed procedures for performing specific activities, such as pumping system installations, field monitoring analyses and documentation, and QA records management. Groundwater monitoring activities are also included in the *Waste Isolation Pilot Plant Environmental Monitoring Plan* (DOE/WIPP-99-2194).

6.1 SITE HYDROLOGY

The hydrology at and surrounding the WIPP site has been studied extensively over the past 40 years. The following sections summarize the hydrology in this area. Figure 6.1 shows a generalized schematic of the site's stratigraphy. Details for hydrology and stratigraphy can be found in Mercer (1983), Beauheim (1986, 1987), and Beauheim and Ruskauff (1998).

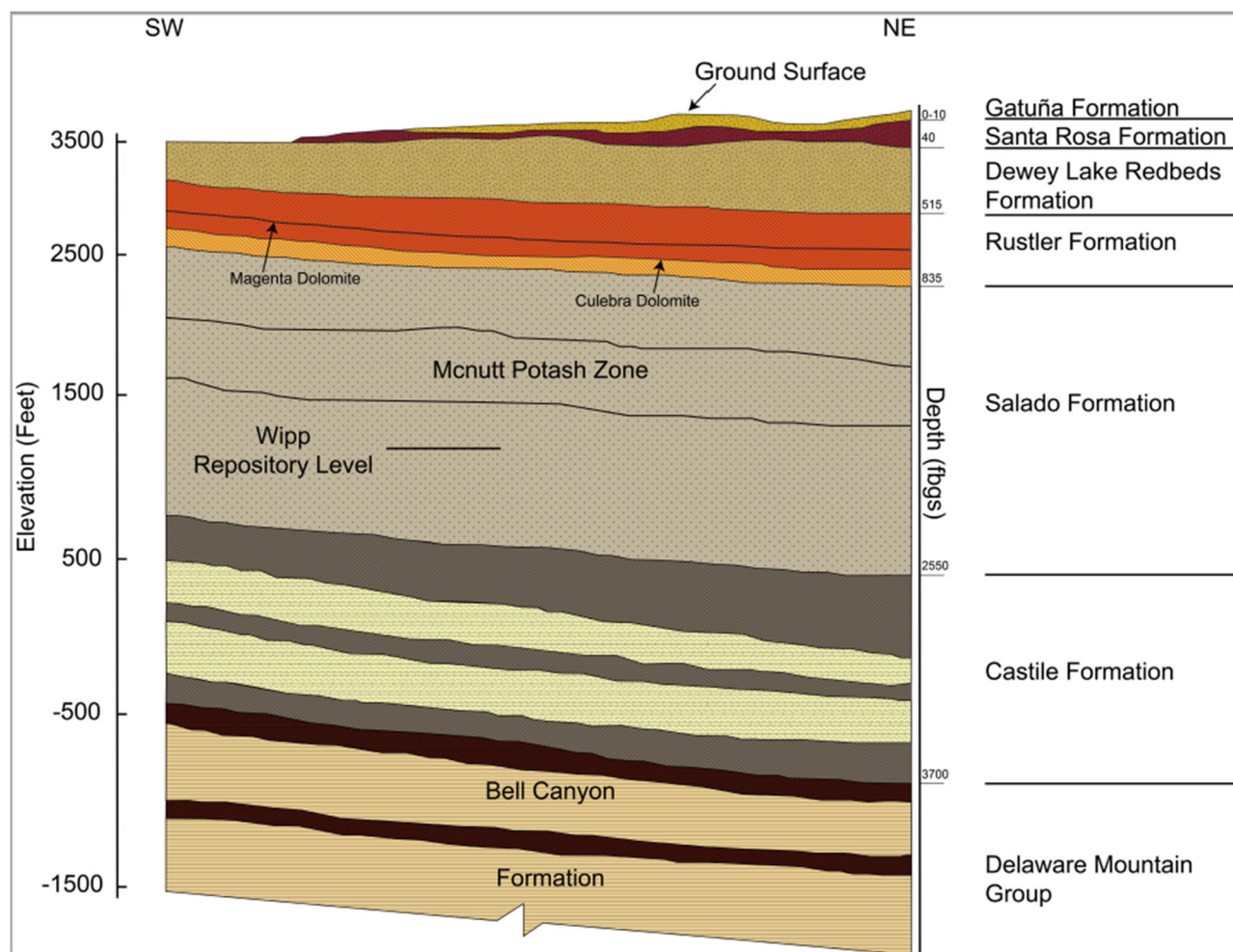


Figure 6.1 – WIPP Stratigraphy

6.1.1 Surface Hydrology

Surface water is absent at the WIPP site. The nearest significant surface water body, Laguna Grande de la Sal, is 13 km (8 mi) west-southwest of the center of the WIPP site in Nash Draw, where shallow brine ponds occur. Small, manmade livestock watering holes (tanks) occur several kilometers from the WIPP site but are not hydrologically connected to the formations overlying the WIPP repository.

6.1.2 Subsurface Hydrology

Several water-bearing zones have been identified and extensively studied at and near the WIPP site. Limited amounts of potable water are found in the middle of the Dewey Lake Redbeds Formation (Dewey Lake) and the overlying Triassic Dockum group in the southern part of the WLWA. Two saline water-bearing units, the Culebra and the Magenta Dolomite (Magenta), occur in the Rustler. Another very low transmissivity, saline water-bearing zone occurs at the Rustler-Salado contact.

6.2 GROUNDWATER MONITORING

6.2.1 Program Objectives

The objectives of the groundwater monitoring program are to:

- Monitor the physical and chemical characteristics of groundwater.
- Maintain surveillance of groundwater levels surrounding the WIPP facility throughout the operational lifetime of the facility.
- Document and identify effects, if any, of WIPP operations on groundwater parameters throughout the operational lifetime (including closure) and post-closure of the facility.

Data obtained through the WIPP groundwater monitoring program support two major regulatory programs: (1) the RCRA, DMP supporting the Permit in compliance with 20.4.1.500 NMAC (incorporating 40 CFR Part 264, Subpart F, “Releases From Solid Waste Management Units,” and 40 CFR Part 264, Subpart X, “Miscellaneous Units”), and (2) performance assessment supporting *Title 40 CFR Part 191 Subparts B & C Compliance Certification Application for the Waste Isolation Pilot Plant* (DOE/CAO-96-2184) and 5-year CRAs.

Baseline water chemistry data in the DMP wells were collected from 1995 through 1997 and reported in the *Waste Isolation Pilot Plant RCRA Background Groundwater Quality Baseline Report* (DOE/WIPP-98-2285). The baseline data were expanded in 2000 to include 10 rounds of sampling instead of five and the sample distribution type was based upon the 10 rounds. The 95th upper tolerance limit value (UTLV) is used in cases where the sample distribution type is either normal or lognormal. The 95th percentile value is used in cases where the sample distribution type is nonparametric or has greater than 15 percent non-detects. The data were published in Addendum 1, *Waste Isolation Pilot Plant RCRA Background Groundwater Quality Baseline Update Report* (IT Corporation, 2000). These baseline data are compared to water quality data collected annually.

6.2.2 Summary of Activities

Culebra’s groundwater monitoring activities include groundwater quality sampling, groundwater level monitoring, and the fluid density survey, as described in this section. The Permit requires these programs. Table 6.1 presents a summary of WIPP groundwater monitoring activities in the CY.

Wells are classified as environmental surveillance wells. The WIPP facility does not have wells required for remediation, waste management, or other uses. Appendix E, table E.3, lists active groundwater monitoring wells used for the WIPP facility at the end of the CY. Radiological data for the CY from the DMP are summarized in chapter 4. The remaining data from the DMP are contained in this chapter.

Table 6.1 – Summary of WIPP Groundwater Monitoring Program

	Surveillance Wells
Total Number of Active Wells during CY	81
Number of Samples from DMP Wells	232 ^a
Number of Analytes from DMP Wells	1128 ^a
Exceedances	None
Number of Water Level Measurements	7241
Number of Wells within the LWB	46
Number of Wells Outside the LWB	36

a. Includes primary, duplicate, and blank samples collected from six wells.

Regular monthly groundwater level data were gathered from 52 wells across the WIPP region, one of which (i.e., C-2737) is equipped with a production-injection packer (PIP) to allow groundwater level surveillance of more than one hydrologic zone in the same well. The six redundant wells on the H-19 pad, the 21 shallow water wells for Santa Rosa/Dewey Lake contact, the one Gatuña well, and the Dewey Lake PZ well (listed in appendix E, table E.3), were measured quarterly. Table E.4 shows the water level data. A water level measurement was not collected where access was unavailable (C-2505, C-2506, PZ-13, and PZ-15 due to ongoing construction work at well location), where well maintenance was ongoing (H-6bR), or where well was dry (PZ-16, PZ-17a, PZ18, PZ-19).

6.2.3 Groundwater Quality Sampling

The Permit required annual groundwater quality sampling was performed from March through May 2025 (round 47 for this CY). Sampling for groundwater quality was performed at six well locations completed in the Culebra (WQSP-1 through WQSP-6) (figure 6.2). Wells WQSP-1, WQSP-2, and WQSP-3 are upgradient of the WIPP shafts within the LWB. The locations of the wells were selected to be representative of the groundwater moving downgradient onto the WIPP site. Wells WQSP-4, WQSP-5, and WQSP-6 are downgradient of the WIPP shafts within the LWB. Well WQSP-4 was also specifically located to monitor a zone of higher transmissivity.

Field analyses for pH, specific gravity, specific conductance, and temperature were performed during the sampling to determine stabilization prior to final sampling. Primary and duplicate samples for groundwater quality were collected from each of the six wells, 232 samples collected in total for round 47 (table 6.1). Groundwater quality sampling results for the six WQSP wells are included in appendix E, table E.2.

The difference between the depth of the WIPP repository (~2,150 ft) and the depth of the detection monitoring wells completed in the Culebra varies from 1,270 ft to 1,926 ft (387 m to 587 m). WIPP-related contamination in the groundwater is not anticipated because a release from the repository up to the Culebra is highly unlikely. For contaminated liquid to move from the repository to the Culebra, three conditions would have to be met. First, sufficient brine would have to accumulate in the waste disposal

areas to leach contaminants from the disposed waste. Second, sufficient pressure would have to build up in the disposal area to overcome the hydrostatic head between the repository and the Culebra. Third, a pathway would have to exist and remain open for contaminated brine to flow from the repository to the Culebra. Since the times required for the brine accumulation and repository pressurization are on the order of thousands of years, and current plans call for the sealing of the shafts and boreholes that could potentially become such pathways upon closure of the facility, WIPP-related contamination of the groundwater is highly unlikely.

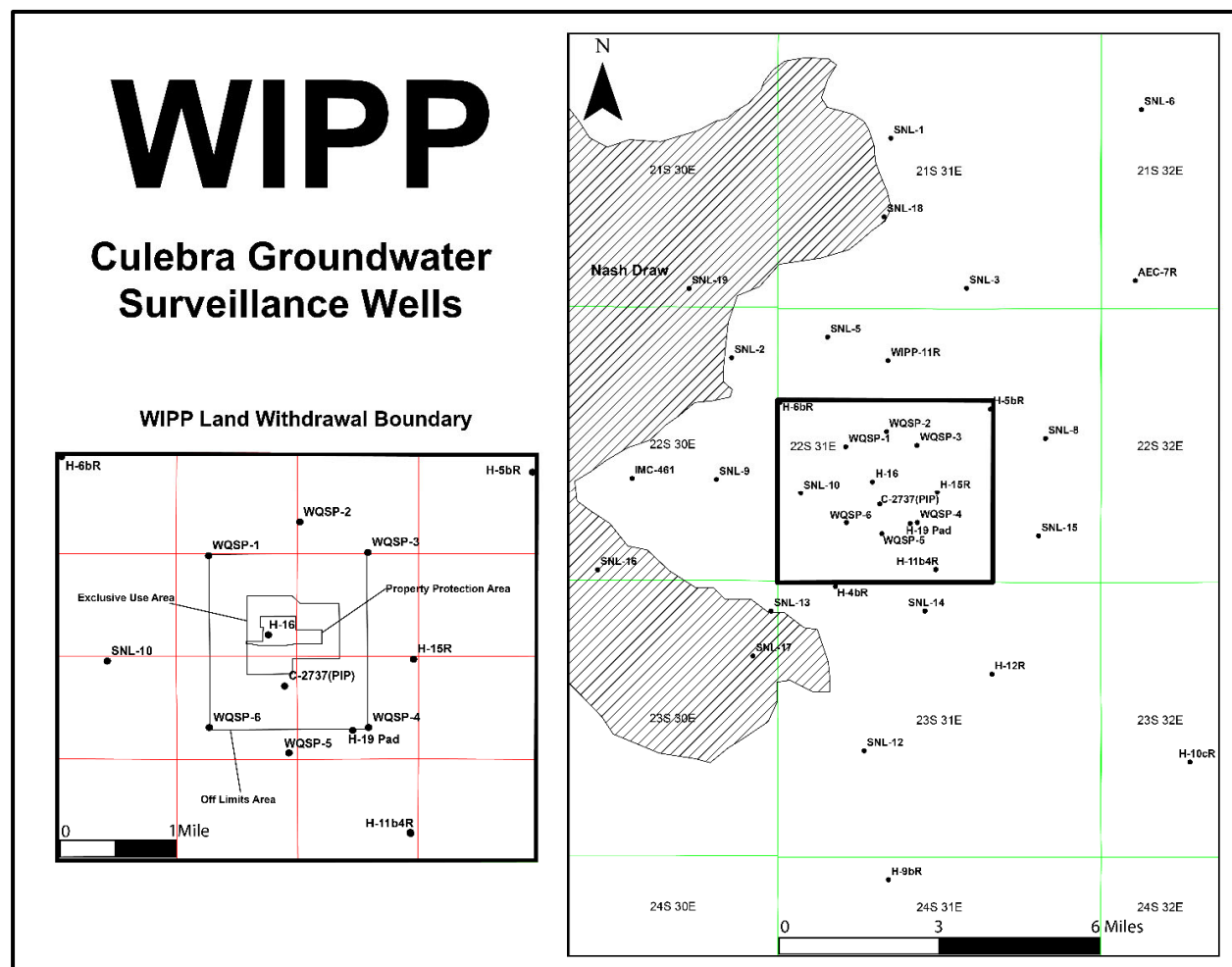


Figure 6.2 – Culebra Groundwater Level Surveillance Wells

6.2.4 Evaluation of Culebra Groundwater Quality

The quality of the Culebra groundwater sampled at the WIPP site is naturally poor and not suitable for human consumption or agricultural purposes because the TDS concentrations are generally above 10,000 mg/L. In the CY, TDS concentrations in the Culebra (as measured in detection monitoring wells) varied from a low of 14,900 mg/L (WQSP-6 primary) to a high of 213,000 mg/L (both WQSP-3 primary and duplicate). The groundwater of the Culebra is Class III water (non-potable) by EPA guidelines.

For comparison, water quality measurements performed in the Dewey Lake indicate the water is considerably better quality than in the Culebra. In CY, the TDS concentrations in water from well WQSP-6A, obtained from the Dewey Lake, averaged 3,155 mg/L. This water is suitable for livestock consumption and is classified as Class II water by EPA guidelines. The saturation of Dewey Lake in the WIPP facility is discontinuous. In addition to this naturally occurring groundwater, anthropogenic PAW has been encountered in the upper Dewey Lake at the Santa Rosa contact (see section 6.4).

Because of the highly variable TDS concentrations within the Culebra, baseline groundwater quality was defined for each well. The CY analytical results showing the concentrations of detectable constituents are displayed as time series plots compared to the baseline concentrations (appendix D). The tables in appendix E display either the 95th UTLV or the 95th percentile value (as calculated for the background sampling rounds) for each parameter, depending on the type of distribution exhibited by the parameter or constituent. Both values represent the concentrations below which 95 percent of the concentrations in a population are expected to occur. The UTLVs were calculated for data that exhibited a normal or a lognormal distribution. The 95th percentile was applied to data that were considered nonparametric (i.e., having neither a normal nor a lognormal distribution with 16–95 percent non-detects). Due to the large number of non-detectable concentrations of organic compounds, the limits for organic compounds were considered nonparametric and based on the contract-required method reporting limit (MRL) (table E.1, appendix E) for the contract laboratory. None of the constituents of interest (organics and trace metals) exceeded the baseline concentrations. Detailed analytical results for each parameter or constituent for the sampling in the CY (round 47) can be found in the *Annual Culebra Groundwater Report* (DOE, November 2025).

6.2.5 Groundwater Level Surveillance

Wells were used to perform surveillance of the groundwater surface elevation of five water-bearing zones in the vicinity of the WIPP facility:

- PAW (Santa Rosa/Dewey Lake contact)
- Dewey Lake
- Magenta
- Culebra
- Bell Canyon

During the CY, water levels in 42 Culebra wells were measured (including the Culebra zone of a dual completion well) and 13 wells in the Magenta (including the Magenta zone of a dual completion well). Two Dewey Lake wells and two Bell Canyon wells were measured. Twenty-one wells in the PAW zone of the Santa Rosa/Dewey Lake contact were measured, as well as one in the Gatuña. Groundwater level measurements were collected monthly at each well location for each available formation. Water levels in redundant well bores (well bores located on well pads with multiple wells completed in the same formation) were measured on a quarterly basis (appendix E, table E.4). Water levels at PAW wells and piezometers were also measured every quarter. A breakdown of the groundwater zones intercepted by each well measured at least once in the CY is given in appendix E, table E.3.

The observation of water elevation variation was performed for 42 Culebra wells and showed 24 naturally changing wells. The subset of wells had a sufficient period of record to analyze through the CY (appendix E, table E.3). Excluded from analysis were SNL-6 and SNL-15, which were both in long-term water level recovery. Because they were only measured quarterly, the redundant H-19 wells were also excluded. Of the 24 naturally changing wells, 19 had an increase and five had a decrease in water levels over the CY. The average increase was 1.92 ft, and the average decrease was -1.15 ft. The CY rainfall was near average at 12.21in (310.13mm).

For the Culebra wells in the vicinity of the WIPP site, equivalent freshwater heads for June 2025 were used to calibrate a groundwater flow model, which was used by Sandia National Laboratories (SNL) to compute a potentiometric surface using SNL procedure SP 9-9 (Kuhlman, 2009). The month of June was judged to have the greatest number of Culebra water levels available that were unaffected by pumping events, and all wells in quasi-steady state. Table 6.2 shows the SNL water-level data set in ft above mean sea level (AMSL). Wells SNL-6 and SNL-15 were not included in the mapping because the elevations do not represent static conditions, wells C2737, H-10cR, and H-16 were also not included because representative water levels were not available during the target months. These wells are in the low transmissivity zone of the Culebra and, after drilling and testing, are still in recovery to reach equilibrium. Adjusted freshwater heads are typically accurate to ± 1.5 ft, given the density measurement error. The density measurement error is less than 0.019 specific gravity units (WP 02-1).

Table 6.2 – Water Level Elevations for the Potentiometric Surface Calibration, Culebra Hydraulic Unit

Well	Measurement Date	Freshwater Head (ft. AMSL)	Specific Gravity (Freshwater at 70°F [21°C])
AEC-7R	6/3/2025	3,062.51	1.073
C-2737 ^a	6/4/2025	2,971.06	1.030
H-4bR	6/2/2025	2,995.27	1.022
H-5bR	6/3/2025	3,063.06	1.093
H-6bR	6/3/2025	3,062.06	1.039
H-9bR	3/3/2025	2,969.79	1.006
H-10cR ^a	6/2/2025	3,051.81	1.094
H-11b4R	6/2/2025	2,990.20	1.076
H-12R	6/2/2025	3,003.39	1.106
H-15R	6/4/2025	3,000.00	1.125
H-16 ^a	6/4/2025	2,932.87	1.035
H-19b0	6/4/2025	2,984.05	1.059
IMC-461	6/3/2025	3,034.46	1.012
SNL-1	6/3/2025	3,072.21	1.023

Well	Measurement Date	Freshwater Head (ft. AMSL)	Specific Gravity (Freshwater at 70°F [21°C])
SNL-2	6/3/2025	3,065.00	1.013
SNL-3	6/3/2025	3,071.49	1.032
SNL-5	6/3/2025	3,061.95	1.005
SNL-6 ^b	6/3/2025	3,500.24	1.265
SNL-8	6/3/2025	3,056.93	1.096
SNL-9	6/3/2025	3,046.29	1.019
SNL-10	6/3/2025	3,038.79	1.012
SNL-12	6/2/2025	2,989.33	1.009
SNL-13	6/2/2025	3,001.06	1.027
SNL-14	6/2/2025	2,991.05	1.051
SNL-15 ^b	6/2/2025	3,129.28	1.234
SNL-16	6/2/2025	3,005.41	1.006
SNL-17	3/3/2025	3,001.21	1.003
SNL-18	6/3/2025	3,062.91	1.002
SNL-19	6/3/2025	3,063.99	1.006
WIPP-11R	6/3/2025	3,067.36	1.028
WQSP-1	6/3/2025	3,062.12	1.041
WQSP-2	6/3/2025	3,065.63	1.035
WQSP-3	6/3/2025	3,055.32	1.142
WQSP-4	6/4/2025	2,986.20	1.071
WQSP-5	6/4/2025	2,982.34	1.021
WQSP-6	6/4/2025	2,990.27	1.007

a. Water levels impacted by oil field activities or Shaft 5 mining

b. Water levels have not fully recovered from original drilling; well excluded from mapping, long-term recovery

Modeled freshwater head contours for June 2025 for the model domain are shown in figure 6.3 (Akara, 2026). For this model, an ensemble of 100 calibrated parameters (transmissivity [T], horizontal anisotropy [A], and recharge [R]) fields were used. The calibrated parameter fields were taken from Task 7 of the Analysis Report pertaining to AP-203 (Bowman et al., 2023).

Figure 6.4 shows the hydraulic head contours within and around the WIPP LWB. Hydraulic head contours in the central portion of the map are east-west trending and closely spaced, which suggests a low transmissivity zone. The general east-west trending head contours suggest a north-south groundwater flow direction, as shown with the black arrows in figures 6.3 and 6.4. Figure 6.4 shows the simulated freshwater head contours with measured freshwater heads (in ft AMSL) listed at each well (5-foot contour interval). The black arrows indicate the groundwater flow direction inside the

WIPP LWB (black square). The black dashed line with the arrow in figure 6.4 corresponds to the DTRKMF-simulated pathway that a particle would take from the WIPP waste handling shaft to the WIPP LWB (a path length of 3901.5 m). The blue dashed line in figure 6.4 corresponds to the 2024 DTRKMF-simulated pathway. The DTRKMF output assumes that the transmissive portion of the Culebra is 4 m thick (as opposed to the entire thickness of the aquifer at 7.75 m) and has a constant porosity of 16%. The Culebra thickness is reduced to 4 m to focus all flow through the lower and most permeable portion of the Culebra (Holt, 1997). The DTRKMF-simulated pathway indicates a travel time of 6710.8 years, which corresponds to an average velocity of 0.58 m/yr. The 2025 average velocity is similar to the 2024 value (0.59 m/yr).

The scatter plot in figure 6.5 presents the measured vs. simulated hydraulic heads for all wells used in the calibration process. These wells are divided into three groups, based on their proximity to the WIPP LWB. Wells inside the WIPP LWB are represented by circles, wells outside but within 3 km of the LWB are shown with the squares, and all other wells are indicated by the stars. Figure 6.5 also shows the 1:1 line and the ± 1 m misfit lines. Note that only wells with a misfit greater than 1.5 m are labeled in figure 6.5. The r^2 values presented in Table 6.3 indicate a strong correlation between observed and simulated hydraulic heads. The root mean square error (RMSE) and the normalized RMSE (NRMSE) are 9.9 ft. and 7.7%, respectively. Table 6.3 also indicates that the strongest correlation between simulated and observed heads corresponds to wells inside the WIPP LWB. This is particularly important, given that the WIPP LWB is the primary region of interest in this analysis.

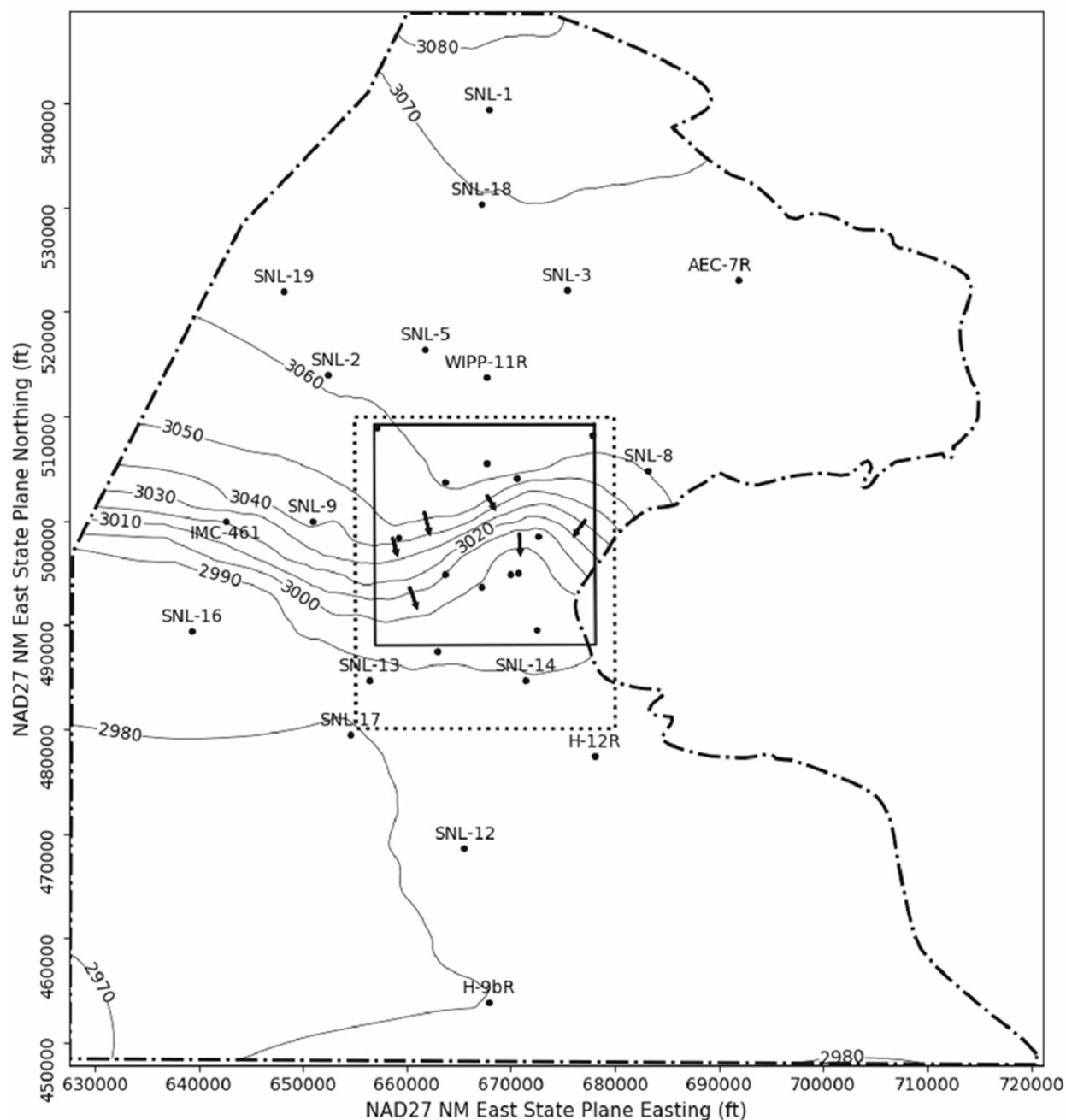


Figure 6.3 – Model-Generated 2025 Culebra Freshwater Head Contours in the Model Domain (Contour interval 10 feet, contour in feet above mean sea level). The dotted rectangle corresponds to the region contoured in figure 6.4. The black square corresponds to the WIPP LWB. Wells inside the WIPP LWB are not labeled; refer to figure 6.2 for identification of these wells. The black arrows indicate the groundwater flow direction inside the WIPP LWB.

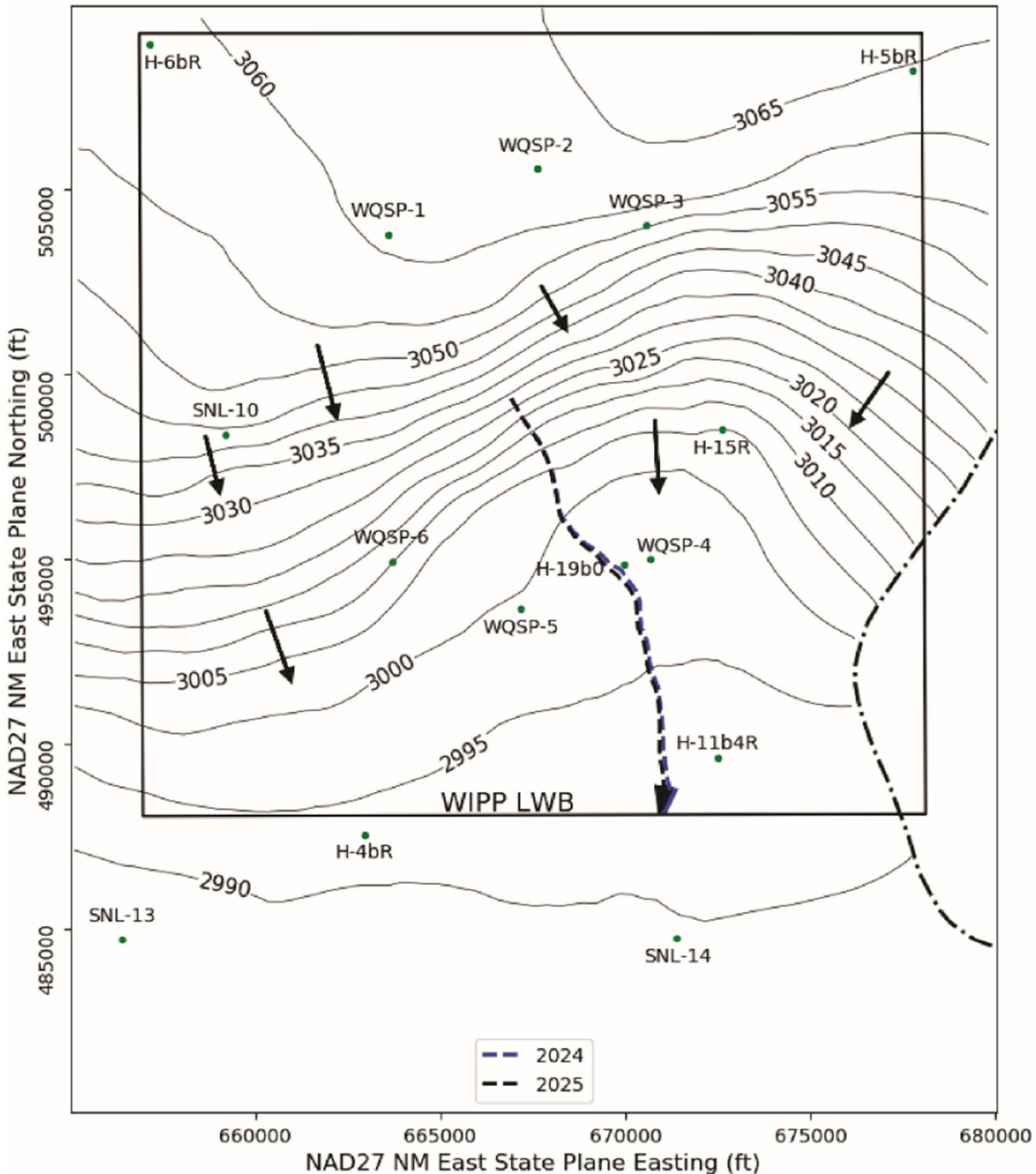
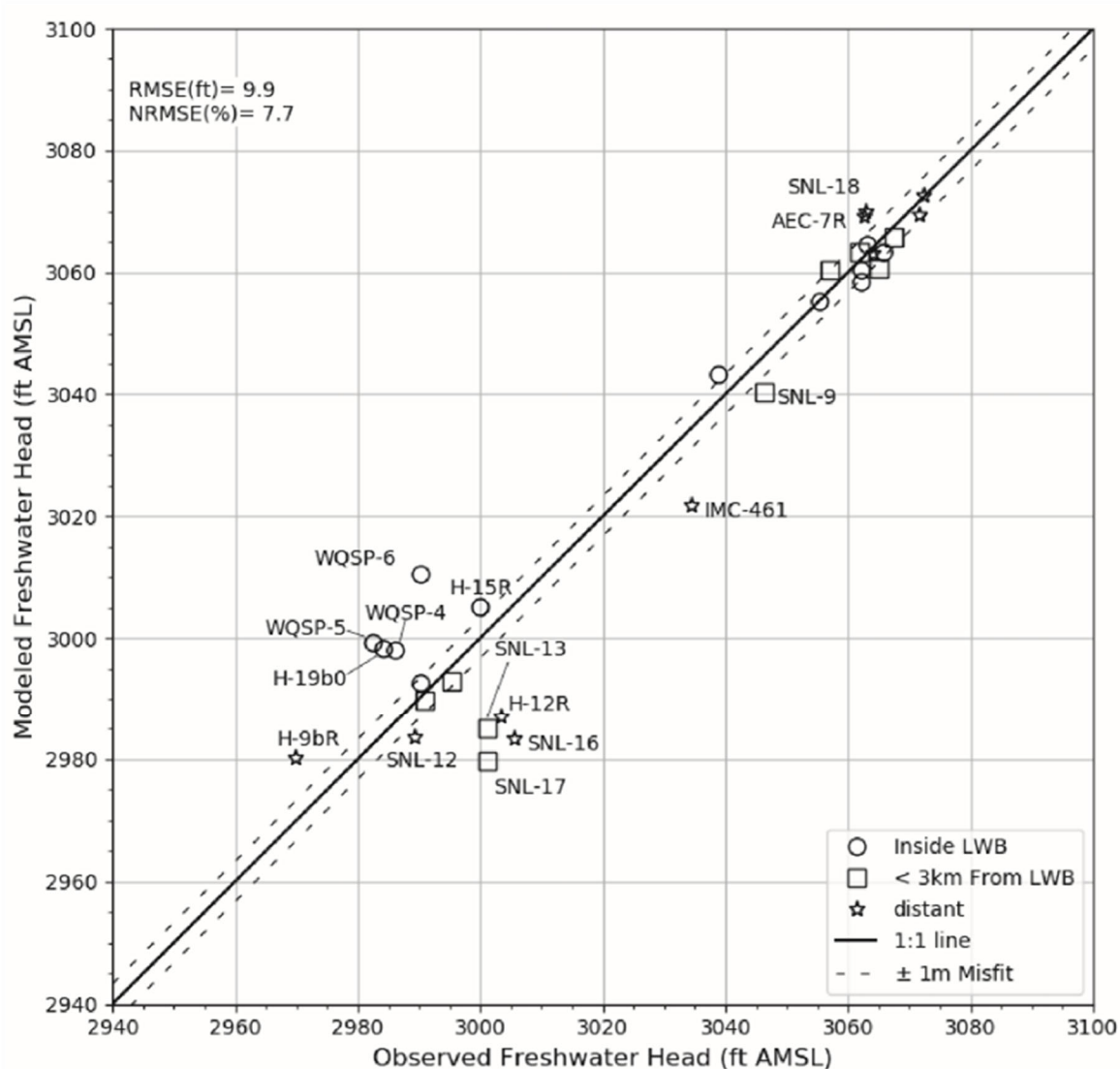


Figure 6.4 – 2025 Simulated Freshwater Head Contours with Measured Freshwater Heads (ft. AMSL) Listed at Each Well (5-foot Contour Interval)

(Contour in ft. AMSL, the dashed lines represent the DTRKMF simulated particle pathways from the waste handling shaft to the WIPP LWB, for 2024 and 2025. The slight shift in particle pathways from 2024 to 2025 results from changes in hydraulic gradient. The black arrows indicate the groundwater flow direction inside the WIPP LWB. The dash-dotted line indicates the active groundwater model boundary).



**Figure 6.5 – Modeled Versus Measured Scatter Plot for Parameter Estimation
Tool-Calibrated MODFLOW 2000 Generated Heads and June 2025 Culebra
Freshwater Heads**

Table 6.3 – r^2 Values of Measured vs. Modeled Hydraulic Heads

	Dataset	Measured vs. Modeled r^2
Calibrated	wells inside WIPP LWB	0.9790
	wells < 3km from WIPP LWB	0.9227
	all wells	0.9218

6.2.6 Fluid Density Surveys

At the WIPP site, variable TDS concentrations result in variability in groundwater density (WP 02-1). WIPP personnel measure the density of well-bore fluids in water-level monitoring wells to adjust water levels to their equivalent freshwater head values. This allows a more accurate determination of relative heads between wells. In the CY, densities were derived from 36 wells containing pressure transducers installed by SNL (table 6.4). For comparison, 2023 and 2024 density data are shown. Year-to-year density differences are within the error described in WP 02-1.

Table 6.4 – Fluid Density Survey

Well	2023 Fluid Density Survey Result (g/cm ³)	2023 Conversion to Specific Gravity at 70°F (unitless)	2024 Fluid Density Survey Result (g/cm ³)	2024 Conversion to Specific Gravity at 70°F (unitless)	2025 Fluid Density Survey Result (g/cm ³)	2025 Conversion to Specific Gravity at 70°F (unitless)
SNL-6	1.260	1.263	1.262	1.265	1.261	1.264
SNL-15	1.232	1.234	1.232	1.234	1.234	1.236
WQSP-3 ^a	1.144	1.147	1.143	1.146	1.143	1.146
H-15R	1.125	1.127	1.123	1.125	1.125	1.127
H-12R	1.104	1.106	1.104	1.106	1.098	1.100
SNL-8	1.096	1.098	1.094	1.096	1.095	1.097
H-10cR	1.092	1.094	1.092	1.094	1.092	1.094
H-5bR	1.090	1.092	1.091	1.093	1.090	1.092
AEC-7R	1.070	1.072	1.071	1.073	1.075	1.077
H-11b4R	1.074	1.076	1.074	1.076	1.073	1.075
WQSP-4 ^a	1.076	1.078	1.073	1.075	1.073	1.075
H-19b0 ^b	1.062	1.064	1.057	1.059	1.056	1.058
SNL-14	1.046	1.048	1.049	1.051	1.052	1.054
WQSP-1 ^a	1.047	1.049	1.046	1.048	1.047	1.049
WQSP-2 ^a	1.044	1.046	1.045	1.047	1.047	1.049
H-6bR	1.037	1.039	1.037	1.039	1.037	1.039
SNL-3	1.026	1.028	1.030	1.032	1.031	1.033
C-2737	1.027	1.029	1.028	1.030	1.029	1.031
WQSP-5 ^a	1.027	1.029	1.027	1.029	1.027	1.029
WIPP-11R	1.026	1.028	1.026	1.028	1.026	1.028
H-16	1.033	1.035	1.033	1.035	1.024	1.026
H-4bR	1.021	1.023	1.020	1.022	1.020	1.022
SNL-13	1.025	1.027	1.025	1.027	1.020	1.022

Well	2023 Fluid Density Survey Result (g/cm ³)	2023 Conversion to Specific Gravity at 70°F (unitless)	2024 Fluid Density Survey Result (g/cm ³)	2024 Conversion to Specific Gravity at 70°F (unitless)	2025 Fluid Density Survey Result (g/cm ³)	2025 Conversion to Specific Gravity at 70°F (unitless)
SNL-1	1.033	1.035	1.021	1.023	1.019	1.021
SNL-9	1.016	1.018	1.017	1.019	1.018	1.020
WQSP-6 ^a	1.015	1.017	1.018	1.020	1.017	1.019
IMC-461	1.010	1.012	1.010	1.012	1.012	1.014
SNL-10	1.006	1.008	1.010	1.012	1.008	1.010
SNL-12	1.011	1.013	1.007	1.009	1.008	1.010
SNL-16	1.009	1.011	1.004	1.006	1.008	1.010
SNL-2	1.011	1.013	1.011	1.013	1.006	1.008
SNL-5	1.005	1.007	1.003	1.005	1.005	1.007
SNL-19	1.004	1.006	1.004	1.006	1.004	1.006
H-9bR	1.002	1.004	1.004	1.006	0.999	1.001
SNL-18	1.000	1.001	1.000	1.002	0.999	1.001
SNL-17	1.002	1.004	1.001	1.003	0.997	1.000

Note. Wells listed by decreasing specific gravity (2025 values). Notes for 2023 to 2025 Fluid Density Survey follow:

- a. Field hydrometer average
- b. Fluid density used for other H-19 wells

6.3 DRILLING AND PLUGGING ACTIVITIES

No wells were drilled or plugged in the CY.

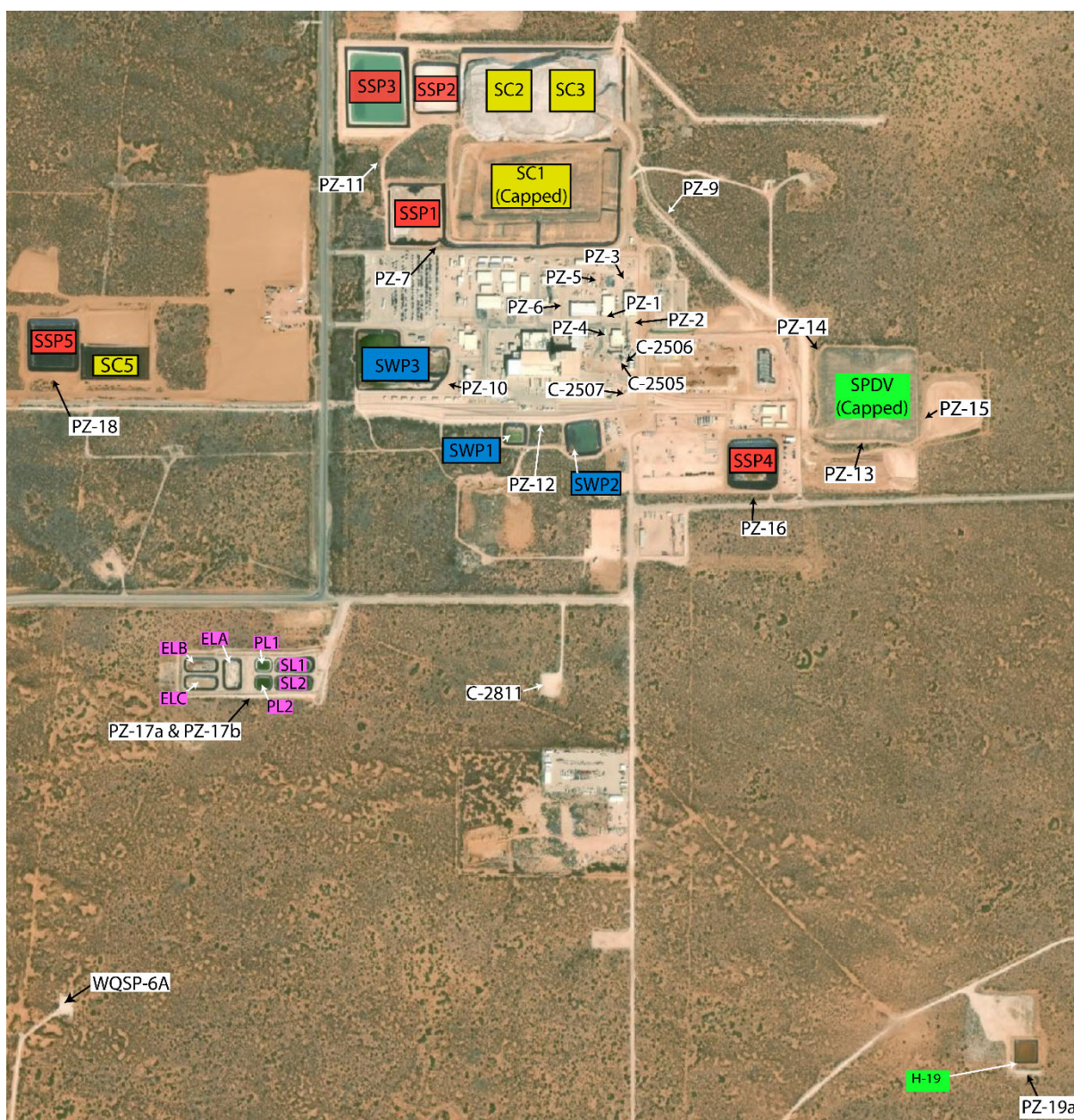
6.4 PERCHED ANTHROPOGENIC WATER MONITORING PROGRAM

Perched anthropogenic waters occur beneath the WIPP site at a depth of 12–21 m (39–69 ft) below ground level at the contact between the Santa Rosa and the Dewey Lake (figure 6.1). Water yields are generally less than 2.79 liters per minute (1 gallon per minute) in monitoring wells and piezometers, and the water contains varying historical concentrations of TDS (874 mg/L to 274,000 mg/L) and chloride (146 mg/L to 197,000 mg/L). To the south, yields are greater, and TDS and chloride concentrations are lower. The origin of the high TDS and chlorides in this water is believed to be primarily from anthropogenic sources, with some contribution from natural sources. The PAW occurs not only under the WIPP site surface facilities, but also to the south, as indicated by shallow water in drill hole C-2811, about 0.8 km (0.5 mi) south of the WIPP facility PPA fence. The PAW primarily resulting from surficial runoff and infiltration existed before the liners were installed. Infiltration controls in the form of liners were installed beginning in 2003 and completed in 2005 for the salt cells and ponds.

In order to investigate the PAW, 21 piezometers completed in the Santa Rosa/Dewey Lake contact (PZ-1 to PZ-7 and PZ-9 to PZ-14, PZ-16, PZ-17a, PZ-18 and PZ-19, C-2505, C-2506, C-2507, and C-2811) and one in the Gatuña (PZ-15) are used as part

of a monitoring program to measure spatial and temporal changes in PAW levels and water quality. Monitoring activities during the CY included PAW level surveillance at these 22 locations (figure 6.6).

Drilling in 2007 around the SPDV salt pile tailings revealed shallow water in three piezometers (PZ-13, PZ-14, and PZ-15, shown in figure 6.7). Natural shallow groundwater occurs in the middle part of the Dewey Lake at the southern portion of the WIPP site (WQSP-6A and PZ-17b; figure 6.7) and to the south of the WIPP site (Mills Ranch). To date, based on water chemistry, there is no indication that the PAW has affected the naturally occurring groundwater in the Dewey Lake.



Legend

Salt Cells

Salt Cell 1 (SC1)
Salt Cell 2 (SC2)
Salt Cell 3 (SC3)
Salt Cell 5 (SC5)

Salt Storage Ponds

Salt Storage Pond 1 (SSP1)
Salt Storage Pond 2 (SSP2)
Salt Storage Pond 3 (SSP3)
Salt Storage Pond 4 (SSP4)
Salt Storage Pond 5 (SSP5)

Storm Water Ponds

Storm Water Pond 1 (SWP1)
Storm Water Pond 2 (SWP2)
Storm Water Pond 3 (SWP3)

Facultative Lagoon System

Settling Lagoon 1 (SL1)
Settling Lagoon 2 (SL2)
Polishing Lagoon 1 (PL1)
Polishing Lagoon 2 (PL2)
Effluent Lagoon A (ELA)
Effluent Lagoon B (ELB)
Effluent Lagoon C (ELC)

0 1,000
Ft



Site and Preliminary Design Validation (SPDV) Material Pile
Evaporation Pond H-19

Figure 6.6 – Location of Perched Anthropogenic Water Wells

6.4.1 Perched Anthropogenic Water Quality Sampling

The DP-831, as issued in January 2022, requires 17 PAW wells (C-2507, C-2811, PZ-1, PZ-5, PZ-6, PZ-7, PZ-9, PZ-10, PZ-11, PZ-12, PZ-13, PZ-14, PZ-15, PZ-16, PZ-17a, PZ-18, PZ-19) and two middle DL wells (WQSP-6A, PZ-17b) to be sampled on a semi-annual basis. These wells were sampled in April (round 43) and October–November 2025 (round 44) and reported in the semi-annual DP-831 reports (DOE, July 2025 and January 2026, respectively). Field parameters were measured for pH, temperature, and specific conductivity in the 19 wells listed above except for PZ-9, PZ-13, PZ-14, and PZ-15, which were bailed, and PZ-16, PZ-17a, PZ-18 and, PZ-19, which were dry and not sampled. Laboratory analysis was performed for Sulfate, Chloride, and TDS in all wells sampled except for PZ-17b, which was also tested for TKN and Nitrate. See tables 6.5 and 6.6 below for chemistry data in the CY.

Table 6.5 – Monitoring Well Depth to Groundwater and Chemical Analyses

	Field and General Chemistry Parameters								Other	Groundwater Level Monitoring (Ft AMSL, NGVD29)	
Monitoring Well	Sample Date	pH (SU)	Temp (°C)	Specific Conductivity @ 25 °C (µS/cm)	Nitrate (N+N mg/L)	Sulfate (mg/L)	Chloride (mg/L)	TDS (mg/L)	TKN (mg/L)	3/5/2025 to 3/6/2025	6/4/2025
PZ-1	4/29/2025	6.40	24.52	59,507	NA	2,150	26,200	55,600	NA	3,369.94	3,369.51
PZ-2	NS	NS	NS	NS	NS	NS	NS	NS	NS	3,369.72	3,369.71
PZ-3	NS	NS	NS	NS	NS	NS	NS	NS	NS	3,370.17	3,369.77
PZ-4	NS	NS	NS	NS	NS	NS	NS	NS	NS	3,365.00	3,364.91
PZ-5	4/29/2025	7.17	23.90	17,243	NA	396	5,480	11,800	NA	3,371.34	3,371.00
PZ-6	4/29/2025	7.03	23.95	31,116	NA	706	10,500	21,700	NA	3,368.58	3,368.33
PZ-7	4/28/2025	6.38	28.86	39,349	NA	1,690	15,500	30,500	NA	3,374.10	3,373.84
PZ-9	4/22/2025	Bailed			NA	4,090	90,600	151,000	NA	3,362.90	3,362.79
PZ-10	4/28/2025	6.80	23.98	2,390	NA	538	383	1,760	NA	3,366.12	3,365.88
PZ-11	4/28/2025	6.29	27.94	97,248	NA	2,350	46,300	77,800	NA	3,370.74	3,370.63
PZ-12	4/28/2025	6.79	23.63	13,315	NA	590	4,360	8,770	NA	3,354.63	3,354.29
PZ-13	4/22/2025	Bailed			NA	3,170	164,000	269,000	NA	3,356.35	3,356.20
PZ-14	4/22/2025	Bailed			NA	2,130	95,900	138,000	NS	3,353.28	3,353.18
PZ-15	4/22/2025	Bailed			NA	3,210	138,000	213,000	NS	3,380.44	3,380.27
PZ-16	NM	NM	NM	NM	NM	NM	NM	NM	NM	3268.04	3,265.09
PZ-17a	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
PZ-17b	4/23/2025	7.16	21.75	3,572	2.52	1,910	458	3,660	ND	3,116.46	3116.12
PZ-18	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
PZ-19	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
C-2505	NS	NS	NS	NS	NS	NS	NS	NS	NS	NM	NM

	Field and General Chemistry Parameters								Other	Groundwater Level Monitoring (Ft AMSL, NGVD29)	
Monitoring Well	Sample Date	pH (SU)	Temp (°C)	Specific Conductivity @ 25 °C (µS/cm)	Nitrate (N+N mg/L)	Sulfate (mg/L)	Chloride (mg/L)	TDS (mg/L)	TKN (mg/L)	3/5/2025 to 3/6/2025	6/4/2025
C-2506	NS	NS	NS	NS	NS	NS	NS	NS	NS	NM	NM
C-2507	4/29/2025	6.69	21.71	18,183	NA	850	6,180	12,700	NA	3,364.34	3,364.26
C-2811	4/28/2025	6.92	21.76	3,256	NA	318	780	2,250	NA	3,344.13	3,344.07
WQSP-6A	4/22/2025	6.98	22.07	4,295	NA	1,690	321	3,210	NA	3,194.86	3,194.90
Notes:											
NA: Not analyzed, parameter not required, per permit conditions.											
NM: Measured but dry or water level is insignificant to get an accurate measurement or sample, or well was inaccessible.											
N+N: Nitrate + Nitrite were reported, did not run separate analysis.											
NS: Not sampled, not required per permit conditions or well had NM status.											
ND: Non-detect.											
Bailed: Field Parameters (i.e., pH, temperature, and specific conductivity) were not measured since a bailer was used to collect the sample due to difficulty using Low-Flow pumps.											
ft amsl: Feet above mean sea level.											
NGVD29: National Geodetic Vertical Datum of 1929.											
"Bold" concentrations exceed standards listed in 20.6.2.3103 NMAC for Human Health and Domestic Water Supply.											

Table 6.6 – Monitoring Well Depth to Groundwater and Chemical Analyses

	Field and General Chemistry Parameters								Other	Groundwater Level Monitoring (Ft AMSL, NGVD29)	
Monitoring Well	Sample Date	pH (SU)	Temp (°C)	Specific Conductivity @ 25 °C (µS/cm)	Nitrate (N+N mg/L)	Sulfate (mg/L)	Chloride (mg/L)	TDS (mg/L)	TKN (mg/L)	9/8 - 9/10/2025	12/2/2025
PZ-1	10/21/25	6.45	22.06	48,056	NS	2,450	21,100	35,500	NA	3,369.54	3,369.71
PZ-2	NS	NS	NS	NS	NS	NS	NS	NS	NS	3,369.43	3,369.60
PZ-3	NS	NS	NS	NS	NS	NS	NS	NS	NS	3,369.47	3,369.31
PZ-4	NS	NS	NS	NS	NS	NS	NS	NS	NS	3,364.78	3,365.13
PZ-5	10/21/25	7.06	23.00	18,491	NS	461	6,870	12,700	NA	3,370.33	3,370.22
PZ-6	10/21/25	6.89	22.60	28,530	NS	812	10,900	19,500	NA	3,368.02	3,368.29
PZ-7	10/20/25	6.54	26.85	68,919	NS	2,540	42,500	73,700	NA	3,373.64	3,373.57
PZ-9	10/21/25	Bailed			NS	4,490	102,000	165,000	NA	3,362.78	3,362.97
PZ-10	10/20/25	7.20	26.20	1,587	NS	324	230	1,160	NA	3,366.45	3,367.05
PZ-11	10/20/25	6.59	26.50	87,299	NS	2,470	49,000	88,600	NA	3,370.50	3,370.56
PZ-12	10/20/25	7.01	23.83	11,740	NS	607	4,230	7,810	NA	3,354.33	3,354.80
PZ-13	10/21/25	Bailed			NS	3,410	180,000	269,000	NA	NM	3,356.12
PZ-14	10/21/25	Bailed			NS	2,090	97,200	148,000	NA	3,353.18	3,353.35
PZ-15	10/21/25	Bailed			NS	3,280	141,000	223,000	NA	NM	3,380.44
PZ-16	NS	NS	NS	NS	NS	NS	NS	NS	NS	MD	MD
PZ-17a	NS	NS	NS	NS	NS	NS	NS	NS	NS	MD	MD
PZ-17b	11/3/2025	7.69	22.34	3,942	2.55	1,960	386	3,580	ND	3,116.19	3,116.23
PZ-18	NS	NS	NS	NS	NS	NS	NS	NS	NS	MD	MD
PZ-19	NS	NS	NS	NS	NS	NS	NS	NS	NS	MD	MD
C-2505	NS	NS	NS	NS	NS	NS	NS	NS	NS	3,366.95	3,367.24
C-2506	NS	NS	NS	NS	NS	NS	NS	NS	NS	3,367.43	3,367.79
C-2507	10/21/25	6.60	20.41	20,068	NS	868	7,140	16,000	NA	3,364.41	3,364.67

	Field and General Chemistry Parameters								Other	Groundwater Level Monitoring (Ft AMSL, NGVD29)	
Monitoring Well	Sample Date	pH (SU)	Temp (°C)	Specific Conductivity @ 25 °C (µS/cm)	Nitrate (N+N mg/L)	Sulfate (mg/L)	Chloride (mg/L)	TDS (mg/L)	TKN (mg/L)	9/8 - 9/10/2025	12/2/2025
C-2811	10/20/25	7.22	21.70	3,152	NS	335	896	2,330	NA	3,343.77	3,344.05
WQSP-6A	10/28/25	7.20	22.23	3,600	NS	1,740	352	3,100	NA	3,194.95	3,195.08
Notes: NA: Not analyzed, parameter not required, per permit conditions. NM: Not measured. Well was inaccessible. MD: Measured but dry or water level is insignificant to get an accurate measurement or sample. N+N: Nitrate + Nitrite were reported, did not run separate analysis. NS: Not sampled, not required per permit conditions or well had MD status. ND: Non-detect. Bailed: Field parameters (i.e., pH, temperature, and specific conductivity) were not measured since a bailer was used to collect the sample due to difficulty using low-flow pumps. ft amsl: Feet above mean sea level. NGVD29: National Geodetic Vertical Datum of 1929. "Bold" concentrations exceed standards listed in 20.6.2.3103 NMAC for human health and domestic water supply.											

6.4.1.1 Results and Discussion

The PAW quality sampling during the CY (rounds 43 and 44) did not identify any new exceedances with respect to groundwater quality standards listed in 20.6.2.3103 NMAC for Human Health and Domestic Water Supply.

6.4.2 Perched Anthropogenic Water Level Surveillance

Twenty-one wells were used for surveillance of the PAW-bearing horizon in the Santa Rosa and the upper portion of the Dewey Lake. Water levels were measured quarterly. Since their highest water levels in 2006, the overall trend has decreased. However, water levels experienced an increase from 2014 to March 2017 due to higher-than-average precipitation levels from 2014 to 2016. During the reporting period, the groundwater levels showed an average decrease in elevation of -0.12 ft. Wells PZ-16, PZ-17a, PZ-18, and PZ-19 were dry; PZ-15, PZ-17b, and WQSP-6A are not set in the Santa Rosa/Dewey Lake aquifer and not considered in the calculation for average water level change.

The potentiometric surface for the PAW using December 2025 data is presented in figure 6.7. The contours were generated using *SURFER*™, Version 29, a surface mapping software by Golden Software. Fifteen data points were used in the contour development, whereas the contours around the SPDV salt pile were estimated by hand.

Groundwater elevation measurements in the PAW (formerly shallow subsurface water) indicate that flow is to the east and south, away from a potentiometric high located near PZ-7 near Salt Storage Pond 1 (figure 6.7). At this time, it appears that the water identified in PZ-13 and PZ-14 is separate and geochemically distinct from the PAW in the other wells at the WIPP facilities area (DOE/WIPP-08-3375, *Basic Data Report for Piezometers PZ-13, PZ-14, and PZ-15 and Shallow Subsurface Water*). Wells PZ-13 and PZ-14 were completed at the contact of the Santa Rosa and Dewey Lake. Well PZ-15 was completed at a shallower level in the Gatuña, where rainwater has accumulated from a localized recharge source.

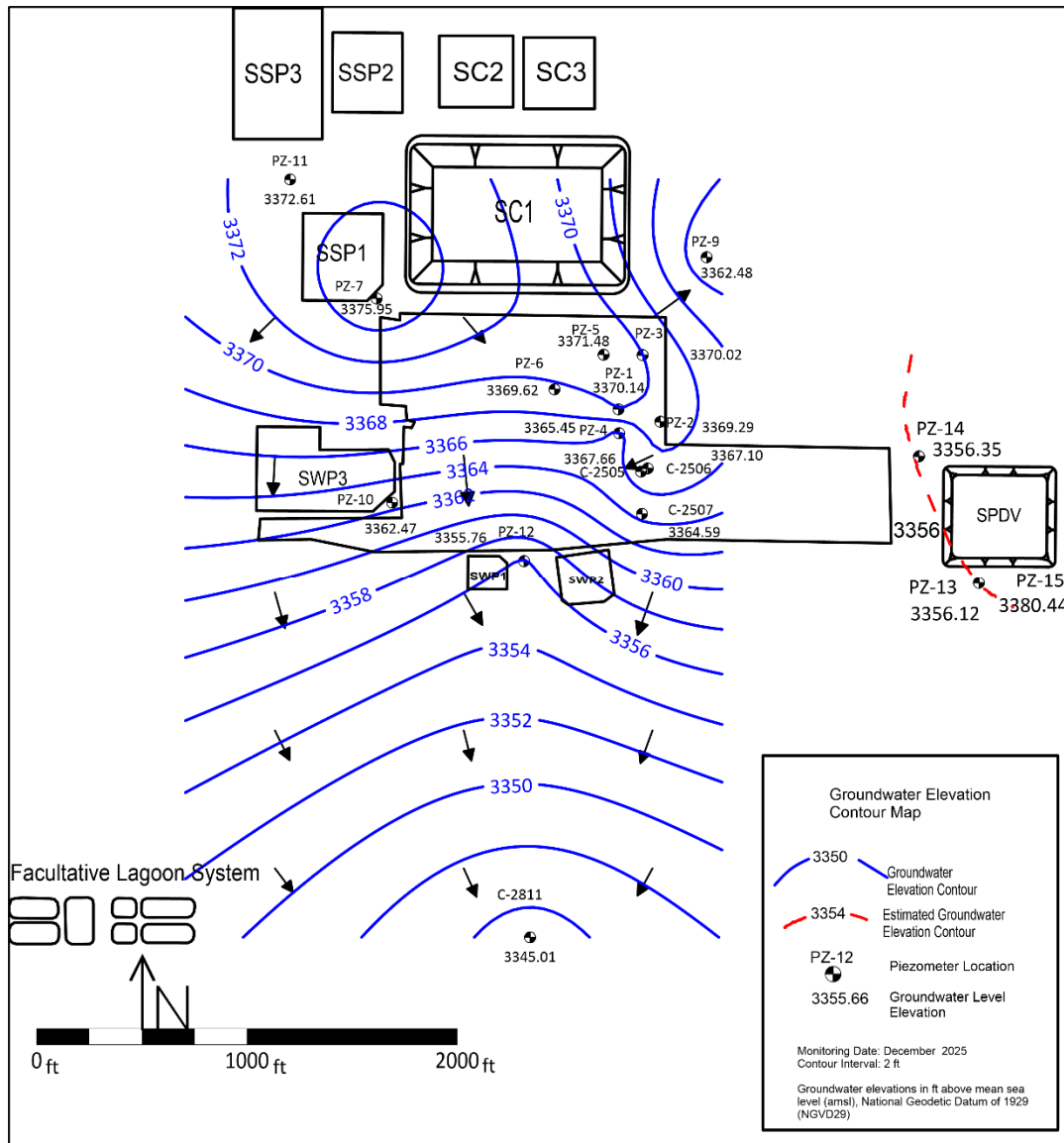


Figure 6.7 – December 2025 Perched Anthropogenic Water Potentiometric Surface

6.5 PUBLIC DRINKING WATER PROTECTION

The water wells nearest to the WIPP site that use the natural Dewey Lake groundwater for domestic use are the wells located on the Mills Ranch. These wells are located approximately 4.8 km (3 mi) south-southwest of the WIPP surface facilities and about 2.8 km (1.75 mi) south of WQSP-6A (figure 6.2). These wells are used for livestock and industrial purposes. Total dissolved solids in the Barn Well have ranged from 630 to 720 mg/L, and TDS concentrations in the Ranch Well have ranged from 2,800 to 3,300 mg/L (DOE/CAO-96-2184).

6.6 EMERGING CONTAMINANTS

In recent years, there has been increasing regulatory interest in emerging contaminants of concern which may be present in the environment and in drinking water supplies. A category of man-made chemicals known as and PFAS have been detected in surface waters and groundwater across the country, and their toxicity and persistence in the environment has led to designation of these substances as emerging contaminants of concern.

The WIPP facility has no records of ordering or using chemicals with PFAS but does have products that may have been manufactured using fluoropolymers (e.g., fire protective gear, ultraviolet-resistant materials). Water is supplied to the WIPP site by the City of Carlsbad from the Double Eagle Water System. The city obtained and analyzed water supply wells in the 2024–2025 time frame for PFAS. The city reported that PFAS were not detected in any of the samples.

To measure PFAS in the environment, PFAS samples were obtained in 2024 at the direction of CBFO in respect to the DOE PFAS strategic roadmap (DOE, 2022) to sample nine groundwater monitoring wells completed in three water bearing zones (all six of the DMP wells, PZ-7, PZ-10, and WQSP-6A) and two lagoons of the Facultative Lagoon System (Settling Lagoons 1 and 2). Initial baseline sample was performed in 2024 and subsequent sampling may be performed as needed. Results of the 2024 sampling are reported in Per- and Polyfluoroalkyl Substances (PFAS) Sampling Report for the Waste Isolation Pilot Plant (DOE, 2024). A total of 14 different PFAS were detected in the WIPP groundwater wells and lagoons analyzed, except PZ-7 that had no PFAS detection. Of the three PFAS detected that have established maximum contaminant level (MCL), PFNA was the most frequently detected in samples with six detections: in WQSP-1, WQSP-2, WQSP-3, WQSP-5, PZ-10, and Settling Lagoon 1. Perfluorooctanoic acid (PFOA) was detected in four samples and PFOS was detected in one sample. The detections of PFOA in WQSP-2 and PZ-10 exceeded the 4.0 ppt MCL. The detections of PFNA, PFOS, and PFOA in Settling Lagoon 1 exceeded the 10 ppt, 4.0 ppt, and 4.0 ppt MCLs, respectively, for these PFAS.

7.0 QUALITY ASSURANCE

The fundamental objective of the environmental QA program is to facilitate the acquisition of accurate and precise analytical data that are technically and legally defensible. Quality data are generated through activities that plan, implement, review, assess, and correct as necessary. Field samples are collected and analyzed in sample delivery groups along with the requisite QC samples using industry-standard analytical methods. The sample analysis results and associated QC data are reviewed, verified, validated, and incorporated into concise and informative reports, which present the data and describe compliance with QA objectives.

During the CY, radiological analyses of environmental samples were performed by WIPP Laboratories in Carlsbad, NM and GEL Laboratories in Charleston, South Carolina (see section 1 for both laboratories). Analyses for VOC Monitoring Program samples were performed by SGS North America Inc. (SGS), see section 7.2. Non-radiological groundwater sample analyses were performed by Eurofins Environment Testing South Central, LLC (Eurofins) in Albuquerque, NM (section 7.3).

The laboratories demonstrated the quality of their analytical data through participation in a reputable, inter-laboratory comparison programs, the Mixed Analyte Performance Evaluation Program (MAPEP), ISO 17034:2026 accredited provider of reference materials for use in proficiency testing, with NELAP providing the accreditation framework. The contracted laboratories were qualified under the DOE Consolidated Audit Program (DOECAP). The laboratories further used the applicable requirements of the CBFO *Quality Assurance Program Document* (DOE/CBFO-94-1012), as flowed down through the *Quality Assurance Program Description* (WP 13-1).

The sampling program and the subcontracted analytical laboratories operate in accordance with general QA plans and specific QA project plans that incorporate QA requirements from the *Quality Assurance Program Description*. These plans address the following elements:

- Management and organization.
- Quality system and description.
- Personnel qualification and training.
- Procurement of products and services, including supplier-related nonconformances.
- Documents and records.
- Computer hardware and software.
- Planning.
- Management of work processes (using standard operating procedures[SOPs]).
- Assessment and response.

- Quality improvement, including the reporting of non-administrative nonconformances.

To ensure that the quality of systems, processes, and deliverables are maintained or improved, four layers of assessments and audits are performed:

- DOE/CBFO performs assessments and audits of the MOC QA program.
- The MOC performs internal assessments and audits of its own QA program.
- The MOC performs assessments and audits of subcontractor QA programs as applied to MOC contract work.
- DOE/CBFO and the MOC also perform routine assessments of the WIPP Laboratories and GEL Laboratories.

The QA objectives for the sampling and analysis program are completeness, precision, accuracy, comparability, and representativeness. Each laboratory processes QA/QC data independently according to laboratory SOPs and statements of work (SOWs). Sections 7.1, 7.2, and 7.3 discuss the QC results for the WIPP Laboratories, SGS, and Eurofins, respectively, regarding how well they met the QA objectives. Quality control sample summaries are included in analytical reports prepared by contract laboratory personnel.

7.1 WIPP LABORATORIES AND GEL LABORATORIES

Samples for analysis of radionuclides were collected using approved WIPP facility procedures. The procedures are based on generally accepted methodologies for environmental sampling, ensuring that the samples were representative of the media sampled. The samples were analyzed for natural radioactivity, fallout radioactivity from nuclear weapons tests, and radionuclides contained in the TRU waste disposed of at the WIPP facility. The WIPP Laboratories organization was located in a leased space in Carlsbad, NM.

In the CY, WIPP Laboratories analyzed the following samples:

- Air particulate composites for first and second quarters
- Surface water
- Sediment
- Soil
- Vegetation collected at WFF, WSS, and WEE
- Rabbit collected in March
- Groundwater

In the CY, GEL Laboratories analyzed the following samples:

- Air particulate composites for third and fourth quarters
- Vegetation collected at SMR, SEC, and MLR
- Rabbit collected in August
- Quail composite

7.1.1 Completeness

The SOW for analyses performed by both Laboratories states that “analytical completeness, as measured by the amount of valid data collected versus the amount of data expected or needed, shall be greater than 90 percent for the MOC sampling programs.”

Valid data were generated from all the samples analyzed in the CY. There were instances where data were qualified due to QC deficiencies, but the results were comparable to the previous year’s data. For example, in the process of uranium testing in groundwater samples, laboratory contamination led to reagent blank samples reporting above the acceptance criteria; however, results from actual samples were within expected values. Thus, 100 percent of the expected samples and measurements for the sampled environmental media (air particulate composites, groundwater, surface water, soil, sediment, plants, and animals) were reported.

7.1.2 Precision

The SOWs state that analytical precision (as evaluated through replicate measurements) will meet control criteria or guidelines established in the industry-standard radiochemical methods used for sample analysis. To ensure the overall quality of analysis of environmental samples, precision was evaluated for sample collection and sample analysis procedures combined, as well as the sample analysis procedures alone. At least one pair of field duplicates was collected and analyzed for each sample matrix type when possible (field duplicates would not necessarily apply to all sample matrix types, such as small animals). The precision of laboratory-generated duplicates was reported by both WIPP Laboratories and GEL Laboratories and reviewed by the data validator. The precision of field duplicates was calculated and reported by the data validator based on the analysis results of the individual samples. The precision objective is a requirement of the laboratory. Batches of samples can be recounted or reprocessed to achieve the laboratory duplicate precision objective before the data is reported.

The relative error ratios (RERs) for field duplicate samples were calculated by the data reviewer as an indicator of the overall precision, reflecting the combination of both sample collection and laboratory analysis. Duplicate samples were collected at the same time, same place, and under similar conditions as the primary samples. Regarding vegetation samples, separate plants were collected to generate a duplicate sample.

For this report, precision data were evaluated using the guidance from *7020 Quality Systems: Radionuclide Determinations in Standard Methods for the Examination of Water and Wastewater* (Standard Methods Committee, 2017). This source suggests that 95 percent of field duplicates should yield RERs less than 1.96. The value of 1.96 is based on the 95 percent confidence interval, but 15 percent of the precision values would be allowed to be greater than 1.96. The WIPP field duplicate analyses yielded zero RER values greater than 1.96, indicating whether the radionuclide was detected or not in the CY. A total of 121 field duplicate RERs were calculated with 100 percent of field duplicates yielding RERs less than 1.96.

7.1.3 Accuracy

The accuracy of the radiochemical analyses was checked by analyzing initial and continuing calibration standards, reagent blanks, matrix filter blanks in the case of air filter composite samples, some aqueous field blanks, and reagent laboratory control samples, which are spiked method blanks as specified in the published industry-standard analytical methods and in the corresponding lab SOPs. Samples for alpha spectrometry analysis were spiked with tracers and samples for ^{90}Sr analysis were spiked with a carrier. The percent recovery of the tracers and carriers were reported as a measure of accuracy, and the analysis results were corrected for the percent recoveries to improve the accuracy of the analyses.

7.1.4 Comparability

The SOWs require both WIPP Laboratories and GEL Laboratories to ensure consistency using standard analytical methods coupled with specific procedures that govern the handling of samples and the reporting of analytical results. Proficiency was also ensured through the participation of the laboratories in DOE-administered proficiency testing. The blind testing of environmental reference samples prepared by MAPEP ensured results measured by WIPP Laboratories and GEL Laboratories were accurate and comparable to those achieved by other comparable accredited laboratories.

Acceptance criteria re-established by calculating the bias of the laboratory results to those reference values prepared by MAPEP:

$$\% \text{ BIAS} = \frac{(100)(\text{Laboratory Result} - \text{Reference Value})}{\text{Reference Value}}$$

The relative biases for each analyte are placed into one of three categories:

1. Acceptable (A) — $\text{BIAS} \leq 20\%$
2. Acceptable with warning (W) — $20\% < \text{BIAS} \leq 30\%$
3. Not acceptable (N) — $\text{BIAS} > 30\%$

The tests included the WIPP target radionuclides $^{233/234}\text{U}$, ^{238}U , ^{238}Pu , $^{239/240}\text{Pu}$, ^{241}Am , ^{40}K , ^{60}Co , ^{137}Cs , and ^{90}Sr . The radionuclide ^{235}U was not requested by MAPEP in 2025. The sample matrices were comparable to those collected on or near the WIPP site.

Results of WIPP Laboratories and GEL Laboratories proficiency testing in 2025 are shown in table 7.1. There were no N-flagged samples for any sample matrix or radionuclide. Four samples received a W flag and are shown in table 7.1. All other radionuclides across all sample matrices received an A flag.

Table 7.1 – Proficiency Testing Results for Contract Analytical Laboratories in 2025

Laboratory	MAPEP Series	Sample Matrices	Acceptable with Warning
WIPP	52 (March 2025)	Soil, water, air filter, vegetation and urine	¹³⁷ Cs for urine
GEL	52 (March 2025)	Soil, water, air filter and vegetation	⁹⁰ Sr for vegetation, ²³⁸ Pu for air filter
GEL	53 (August 2025)	Soil, water, air filter and vegetation	⁹⁰ Sr for soil

The reference value for ¹³⁷Cs in MAPEP series 52 for urine was 6.08E-1 Bq/L with an acceptable range of 4.26E-1 to 7.9E-1. WIPP laboratories reported a value of 4.34E-01 Bq/L, with a bias of -28.6%. There were 9 laboratories reported for ¹³⁷Cs in series 52, all labs reporting acceptable results.

The reference value for ⁹⁰Sr in MAPEP 52 for vegetation was 3.7E-1 Bq/sample, with an acceptable range of 2.59E-1 to 4.81E-1. GEL laboratories reported a value of 2.66E-1 Bq/sample, with a bias of -28.1%. There were 18 laboratories reported for ⁹⁰Sr in MAPEP series 52 with 8 laboratories reporting acceptable results.

The reference value for ²³⁸Pu in series 52 in air filter composites was 2.16E-2 Bq/sample, with an acceptable range of 1.51E-2 to 2.81E-2. GEL laboratories reported a value of 2.72E-2 Bq/sample, with a bias of 25.9%. There were 18 labs reported for ²³⁸Pu in series 52, with 16 reporting acceptable results.

The reference value for ⁹⁰Sr in MAPEP 53 was 7.37E2 Bq/Kg with an acceptable range of 516E2 to 958E2. GEL laboratories reported a value of 5.52E2 with a bias of -25.1%. There were 21 laboratories reported for ⁹⁰Sr in series 53, with 20 laboratories reporting acceptable results.

7.1.5 Representativeness

Representativeness is the extent to which measurements represent the actual environmental condition or population at the time a sample was collected. The primary objective of the Environmental Monitoring Program is to generate environmental data to determine that the health and safety of the population surrounding the WIPP facility is being protected. Analytical representativeness is ensured through technically sound and accepted approaches for environmental investigations, including industry-standard analytical methods and WIPP procedures for sample collection and monitoring for potential sample cross-contamination through the analysis of field blank samples and laboratory method/reagent blank samples. These conditions were satisfied during the sample collection and analysis practices of the WIPP Environmental Monitoring Program in the CY.

7.2 SGS NORTH AMERICA, INC.

The permittees analytical laboratory, SGS, performed the analyses of the air VOC samples collected for the RVMP and DRVMP at the WIPP facility during the CY. The laboratory QA/QC analyses indicated a few instances where SGS was not performing within specifications but could quantify detectable target analytes and maintain

completeness at acceptable levels. For this CY, SGS performed analyses using an established QA/QC program. For instances where the QA/QC analyses were not performed within laboratory specifications, the reported data was evaluated for usability and flagged appropriately using the qualifiers (data flags). The QA/QC results for this reporting period are summarized below. Detailed results are presented in the Semi-Annual Volatile Organic Compound Data Summary Report for the Reporting Period January 1 to June 30, 2025 (DOE-WIPP-25-3612.0) and the Semi-Annual Volatile Organic Compound Data Summary Report for the Reporting Period July 1 to December 31, 2025 (DOE-WIPP-26-3611.0).

7.2.1 Completeness

Completeness is defined in WP 12-VC.02, *Quality Assurance Project Plan for Volatile Organic Compound Monitoring*, as the percentage of the ratio of the number of valid sample results received (i.e., those which meet data quality objectives [DQOs]) versus the total number of samples collected. Completeness may be affected, for example, by sample loss or destruction during shipping, by laboratory sample handling errors, inability to collect the required samples, or by rejection of analytical data during data validation. The expected completeness objective for this program is greater than or equal to 95 percent.

During 2025, data completeness objectives were met for Repository (RVMP) and Underground (DRVMP) VOC monitoring programs. RVMP monitoring achieved an overall annual completeness of 98 percent. Underground monitoring achieved an overall annual completeness of 100 percent (rounded). Table 7.2 summarizes the annual completeness metrics for CY2025.

Table 7.2 – CY2025 VOC Monitoring Data Completeness Summary

Repository													
	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	FINAL TOTAL
Total RVMP Analytes	230	180	180	200	190	180	230	180	200	200	180	230	2380
Total RVMP Analytes meeting DQOs	224	170	169	187	186	179	229	180	199	200	180	230	2333
Completeness Percentage	97%	94%	94%	94%	98%	99%	100%	100%	100%	100%	100%	100%	98%
Underground													
	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	FINAL TOTAL
Total DRVMP Analytes	80	150	140	160	150	230	150	150	260	190	190	190	2040
Total DRVMP Analytes meeting DQO	76	150	140	160	150	230	150	150	260	190	190	190	2036
Completeness Percentage	95%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

7.2.2 Precision

Precision is demonstrated in the VOC Monitoring Program by evaluating results from laboratory duplicate analysis and field duplicate samples. The laboratory duplicate samples consist of a laboratory control sample (LCS), laboratory control sample duplicate (LCSD), and laboratory sample duplicates (duplicate analytical runs of monitoring program samples). The field duplicate is a duplicate sample that is collected in parallel with the original sample and is intended to show consistency in the sample collection method. Duplicate samples are evaluated using the relative percent difference (RPD), as defined in WP 12-VC.02. The RPD is calculated using the following equation.

$$RPD = \frac{(|A - B|)}{(A + B) / 2} \times 100$$

Where:

RPD = relative percent difference.

A = original sample result.

B = duplicate sample result.

Note: vertical lines in the formula above indicate absolute value of A minus B

During the CY, 100 percent of recoveries met the ± 40 percent criterion.

7.2.3 Accuracy

The VOC monitoring program is used to evaluate both quantitative and qualitative accuracy and recovery of internal standards. Qualitative evaluation consists of the evaluation of standard ion abundance for the instrument tune, which is a mass calibration check with bromofluorobenzene performed prior to analyses of calibration curves and samples. All prescribed checks were performed and met all limits.

7.2.3.1 Quantitative Accuracy

Instrument Calibrations

Instrument calibrations are required to have a relative standard deviation percentage of less than or equal to 30 percent for each analyte of the calibration. For VOCs, this is calculated by first calculating the relative response factor as indicated below.

$$\text{Relative Response Factor (RRF)} = \frac{(\text{Analyte Response})(\text{Internal Standard Concentration})}{(\text{Internal Standard Response})(\text{Analyte Concentration})}$$

$$\text{Relative Standard Deviation (RSD)} = \left(\frac{\text{Standard Deviation of Relative Response Factor}}{\text{Average Relative Response Factor of Analyte}} \right) \times 100$$

During the CY, 100 percent of instrument calibrations met the ± 30 percent criterion.

Laboratory Control Sample Recoveries

Laboratory control sample recoveries are required to have an acceptance criterion of ± 40 percent (60 to 140 percent recoveries). Laboratory control sample recoveries are calculated as:

$$\text{Percent Recovery} = \frac{X}{T} \times 100$$

Where:

X = experimentally determined value of the analyte recovered from the standard.

T = true reference value of the analyte being measured.

Internal Standard Area

For VOC analyses, internal standard areas are compared to a calibrated standard area to evaluate accuracy. The acceptance criterion is ± 40 percent.

During the CY, 100 percent of internal standards met the ± 40 percent criterion.

Sensitivity

To meet sensitivity requirements, method detection limit (MDL) for each of the 10 target compounds must be evaluated before sampling begins. The initial and annual MDL evaluation is performed in accordance with Appendix B of 40 CFR Part 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants," and with Chapter 1, *Quality Control*, of EPA SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (1996). The analytical laboratory, SGS, met the MDL requirements for the CY.

7.2.3.2 Qualitative Accuracy

For VOC analyses, the standard ion abundance criterion for bromofluorobenzene is used to evaluate the performance of the analytical system in the ID of target analytes as well as unknown constituents (qualitative accuracy). This ensures that the instrumentation is functioning properly during the analysis of air samples. During the CY, ion abundance criteria were within tolerance.

7.2.4 Comparability

As required by Permit Part 4, Section 4.6.2.1, the Permittees have implemented a proficiency testing (PT) plan for the analytical laboratory. The PT plan is described in Permit Attachment N, Section N-5e. This plan requires the analytical laboratory to participate in a low-concentration PT program, which is provided by an independent laboratory contracted directly with the EPA and is administered twice a year when the analytical laboratory is not accredited by accepted accreditation bodies. The contracted laboratory, SGS, participates in national proficiency test programs twice a year to maintain the accreditations required by the National Environmental Laboratory Accreditation Program and uses Phenova as its PT provider.

7.2.5 Representativeness

Representativeness is ensured using programmatic plans and procedures implementing EPA guidance, designed to collect and analyze samples in a consistent manner. Sample location and collection were performed in accordance with Permit Attachment N to maintain sample integrity and support valid analytical results. No sampling exceptions were identified in CY2025 that impacted the approved standards or procedures or affected the quality of the data obtained.

7.3 EUROFIN'S ENVIRONMENT TESTING SOUTH CENTRAL, LLC

Eurofins performed the chemical analyses for the round 47 groundwater sampling in the CY. Eurofins followed laboratory SOPs based on standard analytical methods from the EPA and *Standard Methods for the Examination of Water and Wastewater*, 22nd and 23rd editions (Eaton et al., 2012, 2017). Eurofins performed analyses for the metals (i.e., barium, beryllium, cadmium, nickel, silver, vanadium, calcium, magnesium, potassium and sodium) by inductively-coupled plasma atomic emission spectroscopy (ICP-AES); antimony, arsenic, lead, selenium, and thallium by inductively-coupled plasma mass spectrometry (ICP-MS), and mercury by graphite furnace atomic

absorption spectroscopy. These methods followed EPA 6010B, EPA 6020, and EPA 7470.

7.3.1 Completeness

Six DMP wells were sampled once in the CY from March through May. The completeness objective was met as analytical results were received for all the samples submitted (100 percent completeness).

7.3.2 Precision

Eurofins provided precision data for the analyses of LCS/LCSD pairs, matrix spike / matrix spike duplicate (MS/MSD) pairs, and single primary groundwater samples analyzed as laboratory duplicates for selected analytes where MS/MSD samples are not applicable. The quality assurance objective (QAO) for the precision of the LCS/LCSD, MS/MSD, and duplicate sample concentrations is ≤ 20 RPD for all constituents and general chemistry parameters.

Considering the hundreds of groundwater sample data points and QA/QC sample data points that were generated during round 47, the number of duplicate groundwater samples and QA samples that did not meet the precision objective was low. Values of the RPD are detailed in the laboratory's QC summary reports located in appendices 3 through 8 of the *Annual Culebra Groundwater Report* (DOE, November 2025).

7.3.3 Accuracy

The accuracy of the analyses was checked by analyzing initial calibration verification standards, continuing calibration verification standards, method blanks, LCS and LCSD samples, and MS/MSD samples, as specified in the standard methods and the corresponding lab SOPs. The daily calibration standards were used to confirm that the response in the daily standard closely matched the corresponding response during the initial calibration. The method blanks were used to confirm that the accuracy of the groundwater sample analyses was not adversely affected by the presence of any of the target analytes as background contaminants that may have been introduced during sample preparation and analysis. Where applicable, the LCS and LCSD samples were analyzed to check that the analytical method was in control by measuring the percent recoveries of the target analytes spiked into clean water. The MS/MSD samples were prepared and analyzed to check the effect of the groundwater sample matrix on the accuracy of the analytical measurements as percent recovery. Although the laboratory experienced some difficulties with some low MS/MSD and surrogate recoveries, likely resulting from the effects of matrix interference on extraction combined with losses due to chromatographic absorption, they did not impact conclusions made with the data. The accuracy of the QC data was quite good, with nearly all LCS/LCSD and some MS/MSD recoveries meeting the QAO for accuracy. The accuracies of the QC data are detailed in the laboratory's QC summary reports located in appendices 3 through 8 of the *Annual Culebra Groundwater Report* (DOE, November 2024).

7.3.4 Comparability

The Permit requires that groundwater analytical results be comparable by reporting data in consistent units and collecting and analyzing samples using a consistent methodology (Permit Attachment L, Section L-7a(2)(vi)). These comparability requirements were met using consistent, approved SOPs for sample collection and analyses. The standard reporting unit for metals and general chemistry parameters was mg/L; and the standard reporting unit for organics was micrograms per liter (µg/L).

Eurofins is certified by NELAP and by several states, including Oregon, Texas, New Mexico, and Arizona. The lab participates in inter-laboratory evaluation programs, including onsite NELAP QA audits. The lab also regularly analyzes performance evaluation samples from a NELAP-accredited proficiency standard vendor. Eurofins obtained proficiency standards from vendor Phenova Certified Reference Materials (a Phenomenex company). Detailed results are in the *Annual Culebra Groundwater Report* (DOE, November 2024).

7.3.5 Representativeness

The groundwater DMP is designed so that representative groundwater samples are collected from specific monitoring well locations. Prior to collecting the final samples from each well, serial samples were collected and analyzed in an onsite mobile laboratory to help determine whether the water being pumped from the monitoring wells was stable and representative of the natural groundwater at each well. The parameters analyzed in the mobile laboratory included temperature, pH, specific gravity, and specific conductance. The final samples for analysis of VOCs, semi-volatile organic compounds (SVOCs), metals, and general chemistry parameters were collected only when it had been determined from the serial sampling analysis results that the water being pumped was representative of the natural groundwater at each location.

APPENDIX A - REFERENCES

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APPENDIX B - LOCATION CODES

BHT	Bottom of the Hill Tank	PCN	Pierce Canyon
BRA	Brantley Lake	PKT	Poker Trap
CBD	Carlsbad	RED	Red Tank
COW	Coyote Well (deionized water blank)	RLK	Red Lake
COY	Coyote (surface water duplicate)	SEC	Southeast Control
FWT	Fresh Water Tank	SMR	Smith Ranch
H19	Evaporation Pond H-19 (DP-831)	SOO	Sample of Opportunity ^a
HIL	Hill Tank	SWL	Sewage Lagoon
IDN	Indian Tank	UPR	Upper Pecos River
LST	Lost Tank	WEE	WIPP East
MLR	Mills Ranch	WFF	WIPP Far Field
NOY	Noya Tank	WSS	WIPP South

a. A SOO code is used for a location that may present itself aside from any other named location. Location of the air SOO: 32°22.246'N, 103°47.325'W (SSCVS trailers; sampler removed).

APPENDIX C - RADIOCHEMICAL EQUATIONS

Scientific Notation

Scientific notation is used to express large or small numbers. For example, 1 million can be written as 1,000,000 or, using E notation, written as 1.0E+06. Converting from scientific notation to a general number requires moving the decimal point either left or right from its current location. If the value given is 4.0E-03, the decimal point should be moved three places to the left, so the general number is 0.004. If the value given is 1.0E+03, the decimal point should be moved three places to the right, so the result would be 1,000.

Method Detection Limits

A method detection limit (MDL) is the lowest amount of a given analyte that can be measured and reported with confidence. The terms Minimal Detectable Concentrations (MDC), Limit of Quantitation (LOQ), and Minimal Detectable Activity, in the case of radionuclides, are used interchangeably by different laboratories. MDLs must be determined for any given method and instrument used for analysis on a regular basis. The specific definitions and calculations of these limits can vary between laboratories.

WIPP Laboratories defines their MDC as the smallest amount (activity or mass) of a radionuclide in a sample that will be detected with a maximum of a 5 percent probability of false positive, a maximum of a 5 percent probability of a false negative and a 95 percent probability for detection, assuming a Gaussian distribution. It is possible to achieve a very low detection level by analyzing a large sample size and counting for an extended time.

The WIPP Laboratories use the following general equation for calculating the MDCs for each radionuclide in various sample matrices:

$$MDC = \frac{3.00 + 4.66 \sqrt{S}}{K T}$$

Where:

- S = net method blank counts. When the method blank counts = 0, the average of the last 30 blanks analyzed are substituted
- K = a correction factor is the product of the efficient of the instrument, the sample aliquot, percent natural isotopic abundance, decay factor (inverse seconds), percent sample recovery, and a unit conversion factor.
- T = counting time (seconds) where the background and sample counting time are identical

For further evaluation of the MDC, refer to ANSI N13.30, *Performance Criteria for Radiobioassay*.

GEL Laboratories calculates its MDLs using a procedure based on concepts of 40 CFR Part 136, Appendix B, Rev 2. A standard with a concentration three to five times the

estimated MDL is prepared and analyzed a minimum of seven times. The MDL is then calculated based upon the standard deviation and degrees of freedom of these results, with verification provided through the analysis of a prepared standard solution two to three times the calculated MDL. Minimum Detectable Activity (MDA) for radiochemistry assays use an industry standard approach based on Multi-Agency Radiological Laboratory Analytical Protocols guidance for posteriori determination of MDA. GEL Laboratories follows the source document EPA 815-B-17-003, Procedure for Safe Drinking Water Act Program Detection Limits for Radionuclides.

Total Propagated Uncertainty

The TPU estimates the uncertainty in the measurement due to all sources, including counting error, measurement error, chemical recovery error, detector efficiency, randomness of radioactive decay, and any other sources of uncertainty.

The TPU for each data point must be reported at the 2-sigma level (2σ TPU), where sigma (σ) is one standard deviation of the calculated result from the mean, taking into account the combined uncertainties of the measurements used to calculate the result. For further discussion of TPU, refer to ANSI N13.30.

Relative Error Ratio

The RER is a method, similar to a t-test, to compare duplicate sample analysis results (see chapters 4 and 7, and WP 02-EM3004, *Radiological Data Verification and Validation*). RER for laboratory duplicates has an objective of ≤ 2 .

$$RPD = \frac{(|A-B|)}{(A+B)/2} \times 100 \text{ Where:}$$

The vertical brackets (| |) indicate absolute value.

A_{pri} = mean activity (primary sample)

A_{dup} = mean activity (duplicate sample).

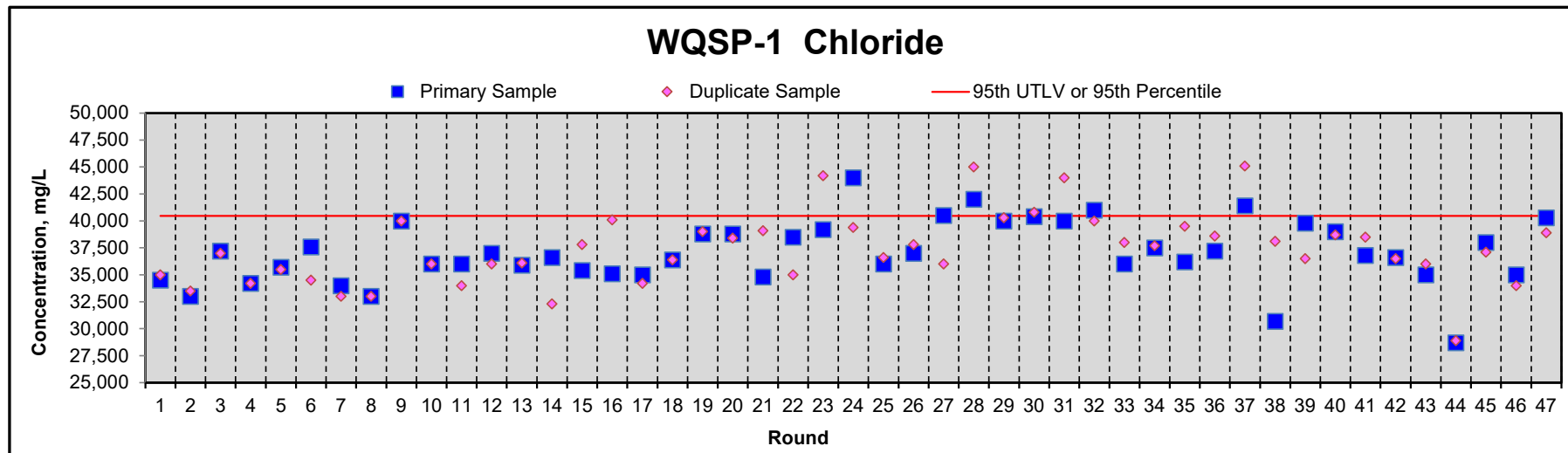
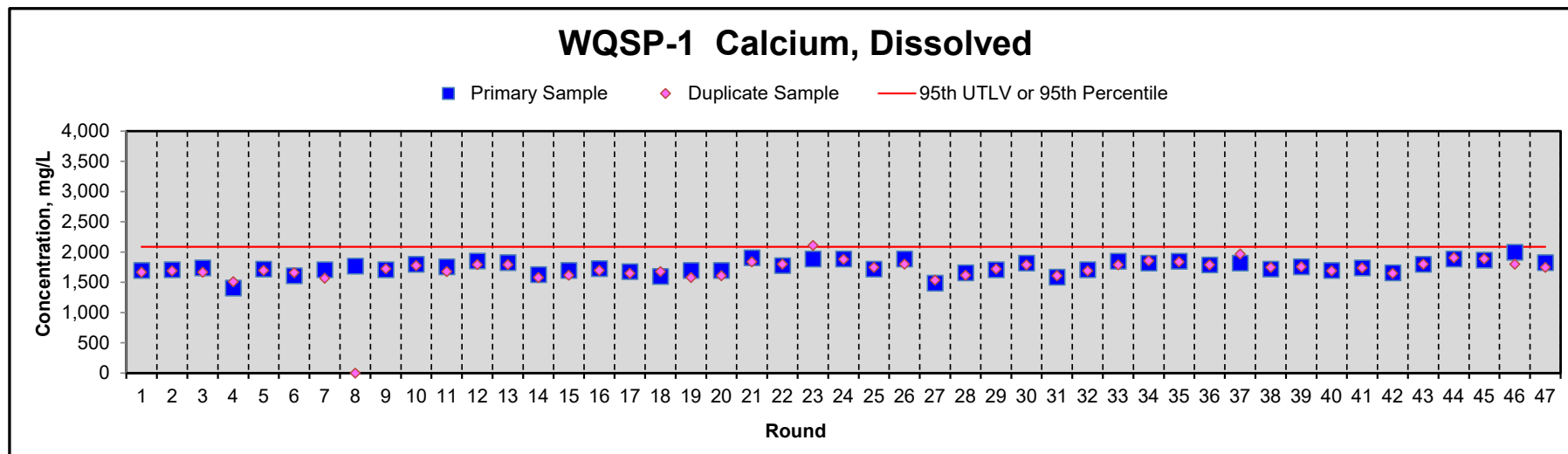
$1\sigma TPU_{pri}$ = total propagated uncertainty at the 1σ level (primary sample)

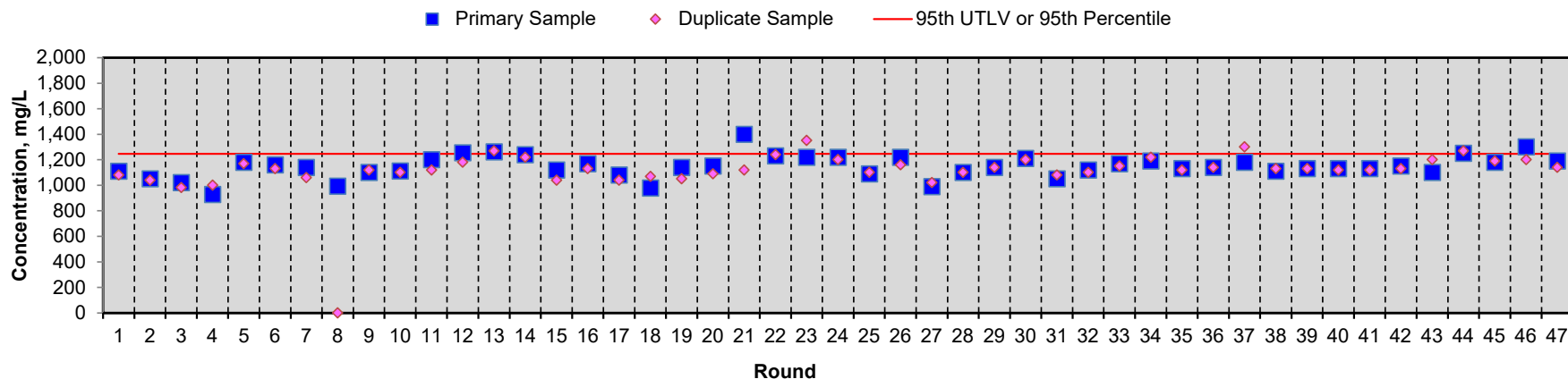
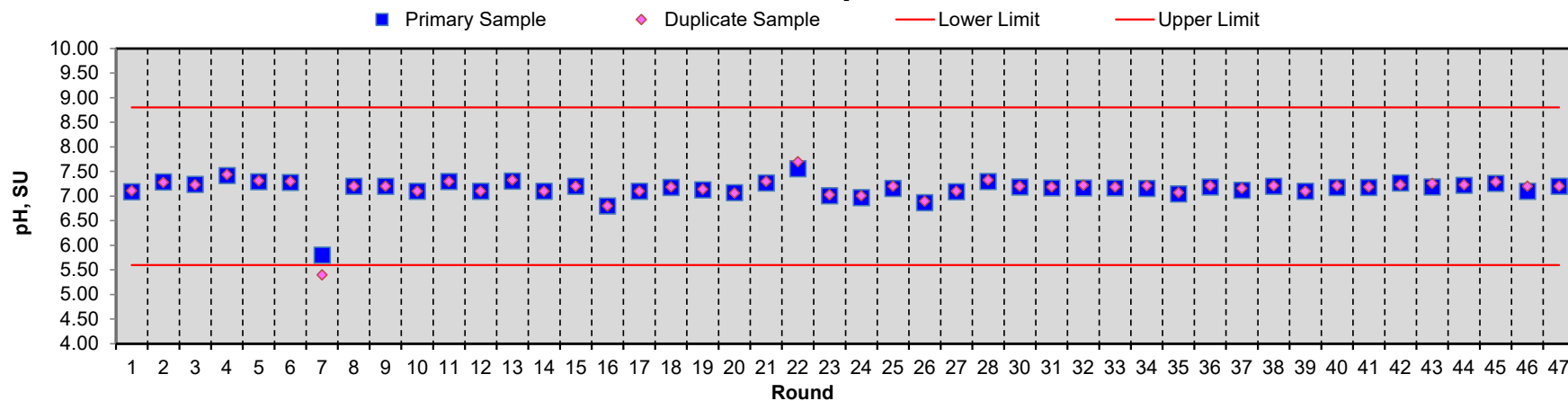
$1\sigma TPU_{dup}$ = total propagated uncertainty at the 1σ level (duplicate sample)

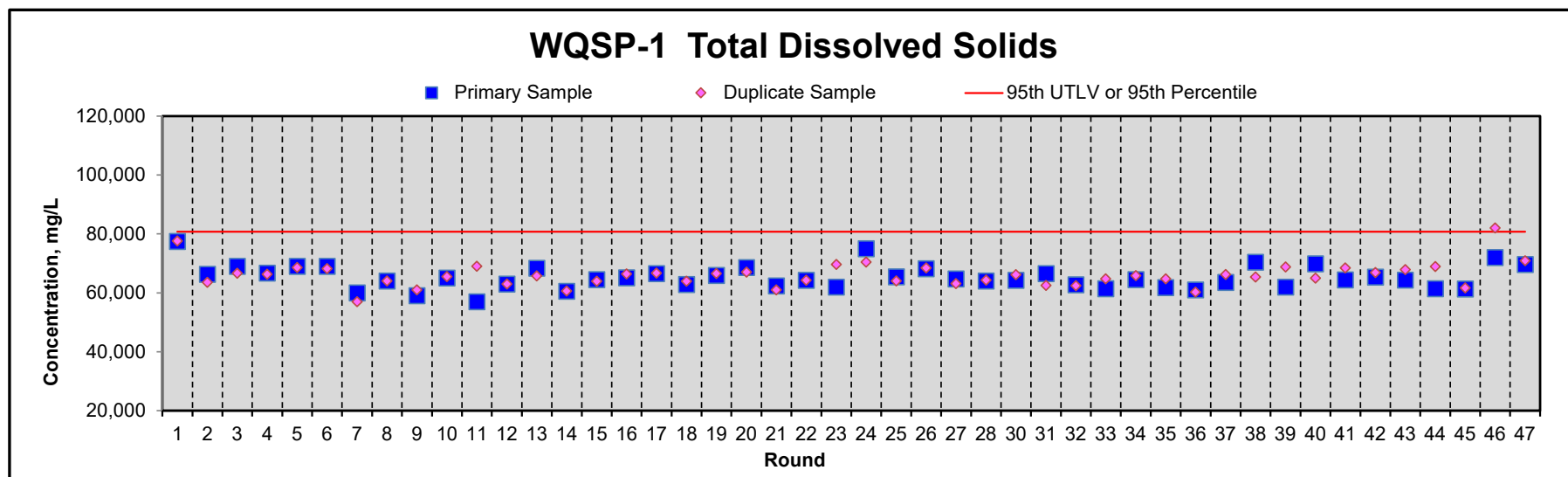
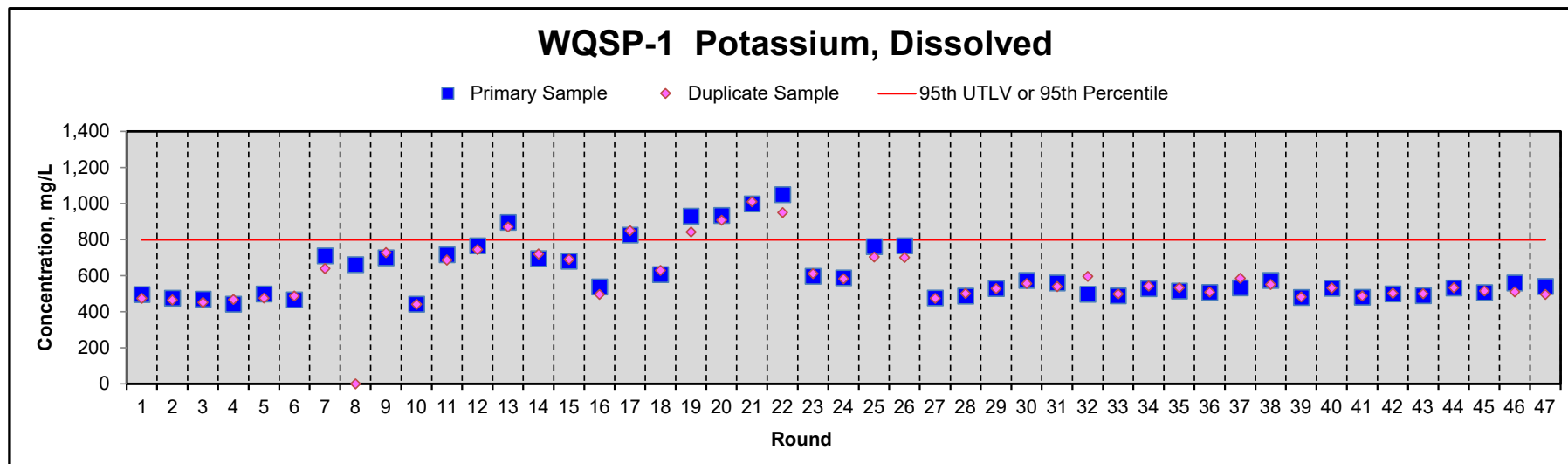
APPENDIX D - TIME SERIES PLOTS FOR MAIN PARAMETERS IN GROUNDWATER

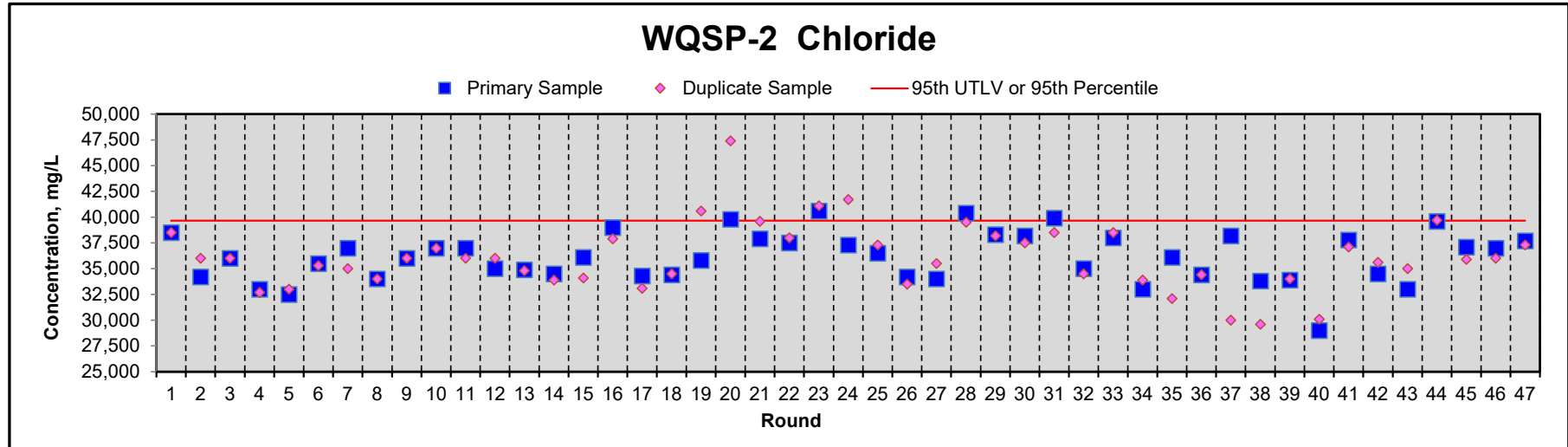
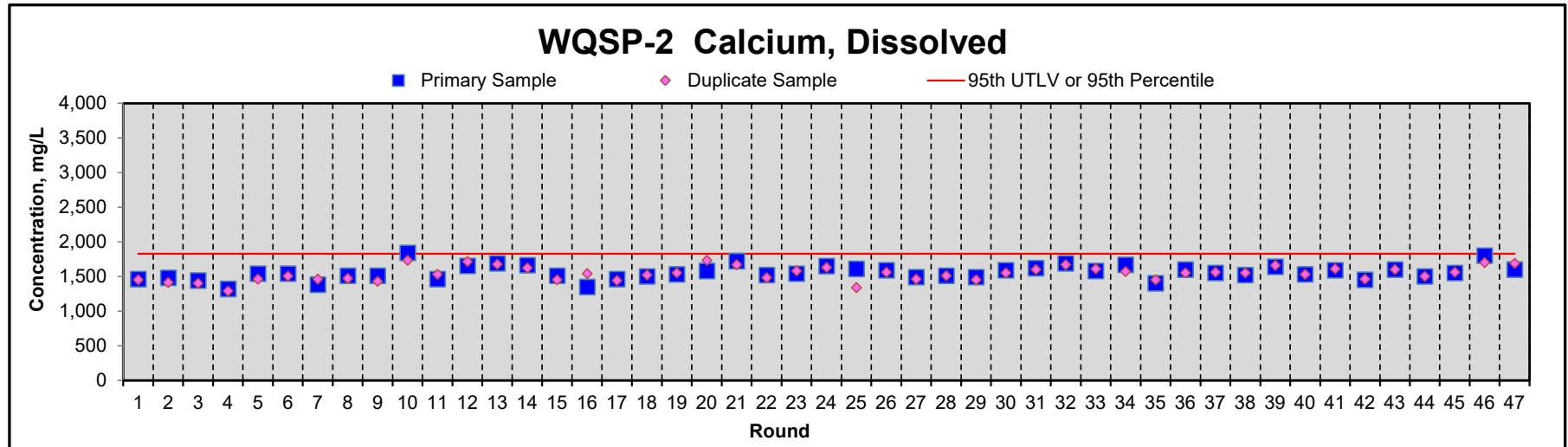
The first 10 sampling rounds were conducted from 1995 through 2000 (prior to receiving mixed waste at the WIPP) and were used to establish the original baseline for groundwater chemistry at each sampling location. The baseline sample sets are used to determine whether statistically significant changes have occurred at any well. Time series plots are provided below for the following general chemistry indicator parameters: dissolved calcium, chloride, dissolved magnesium, pH, dissolved potassium, and TDS. These plots show the concentrations in the primary sample and the duplicate sample for all sampling rounds.

The CY laboratory analytical results were verified and validated in accordance with WIPP procedures and EPA technical guidance. Sampling round 47 samples were collected from March through May 2025. See appendix E for method reporting limits in table E.1 and the results of the target analytes in the DMP wells in table E.2.

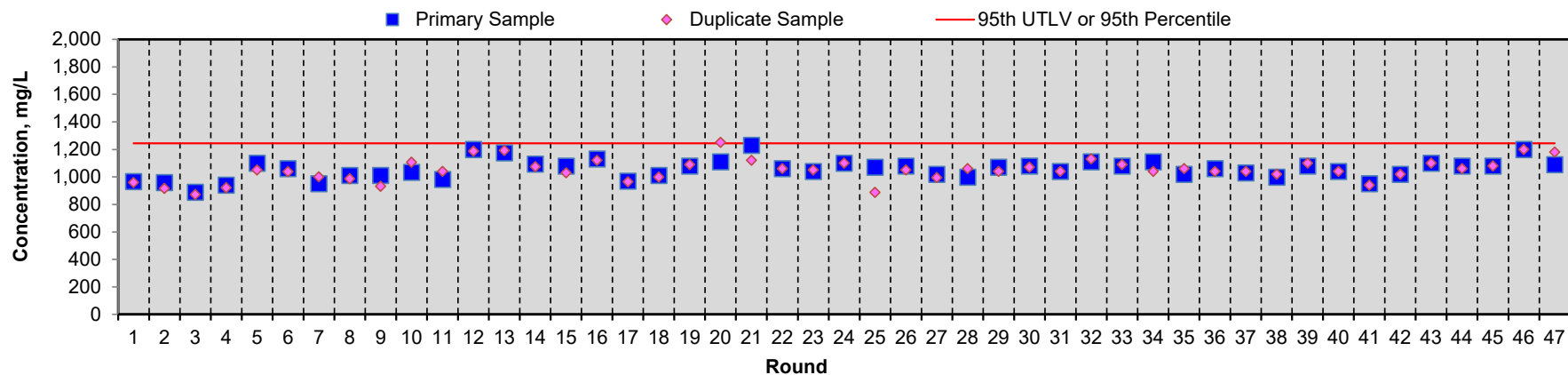


WQSP-1 Magnesium, Dissolved**WQSP-1 pH**

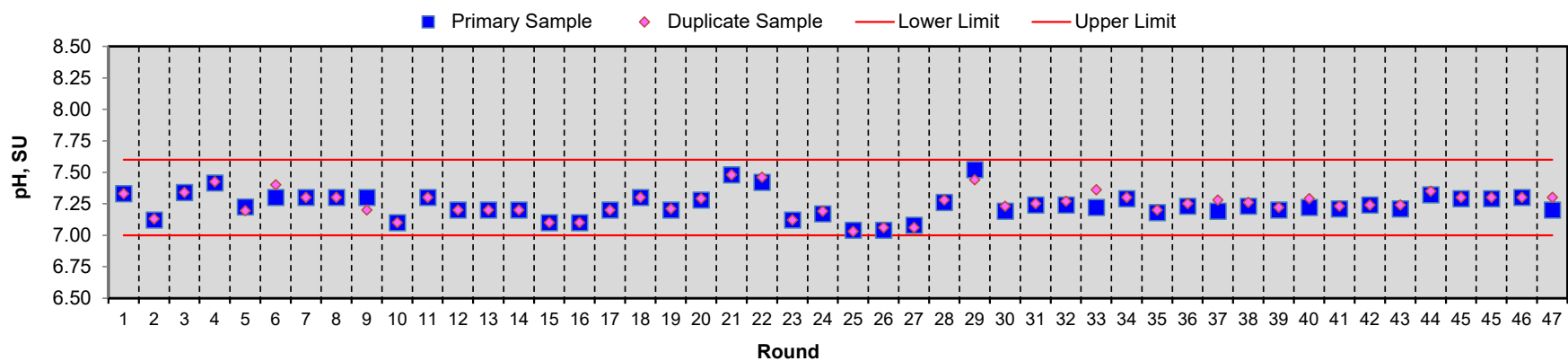


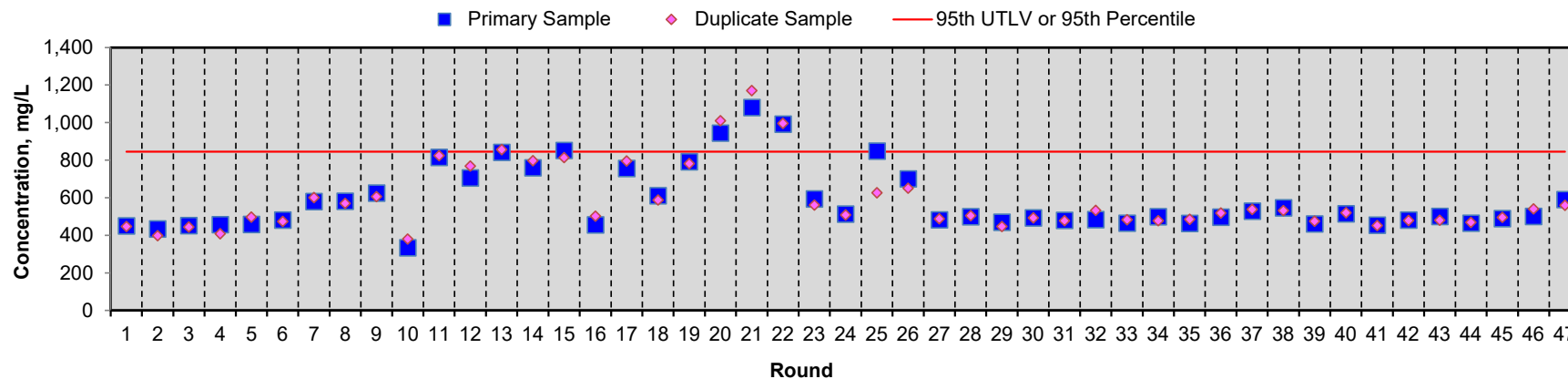
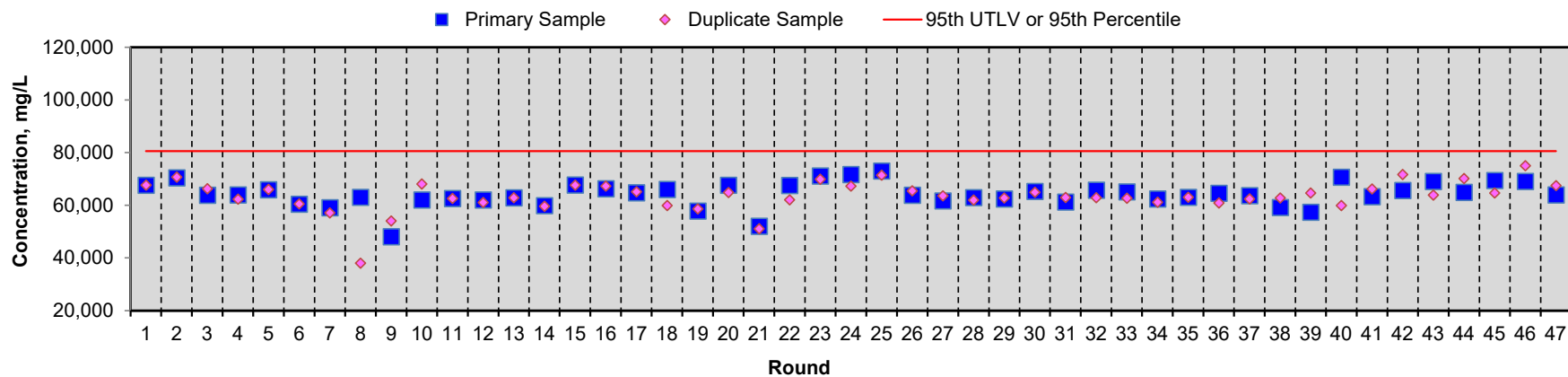


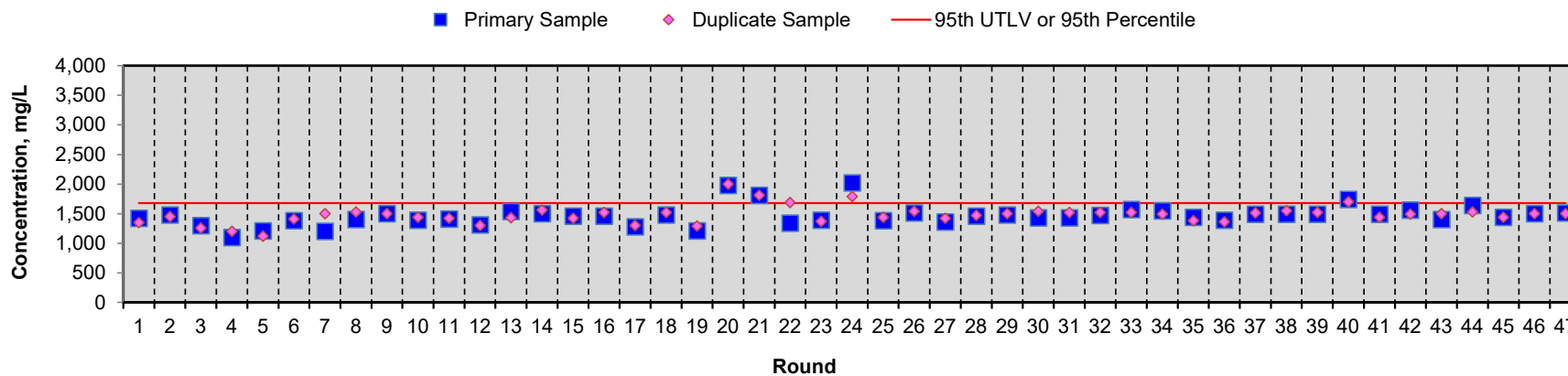
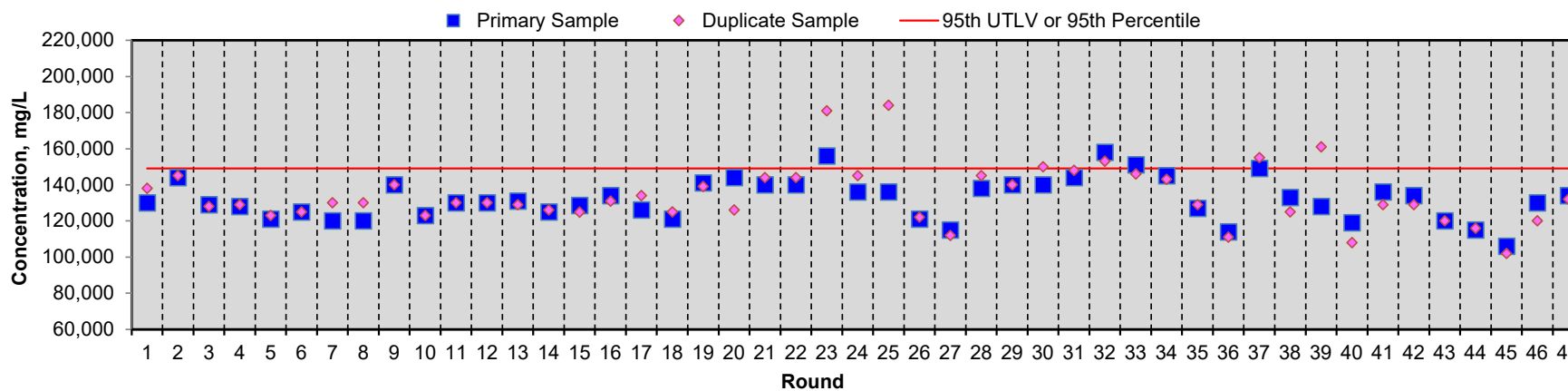
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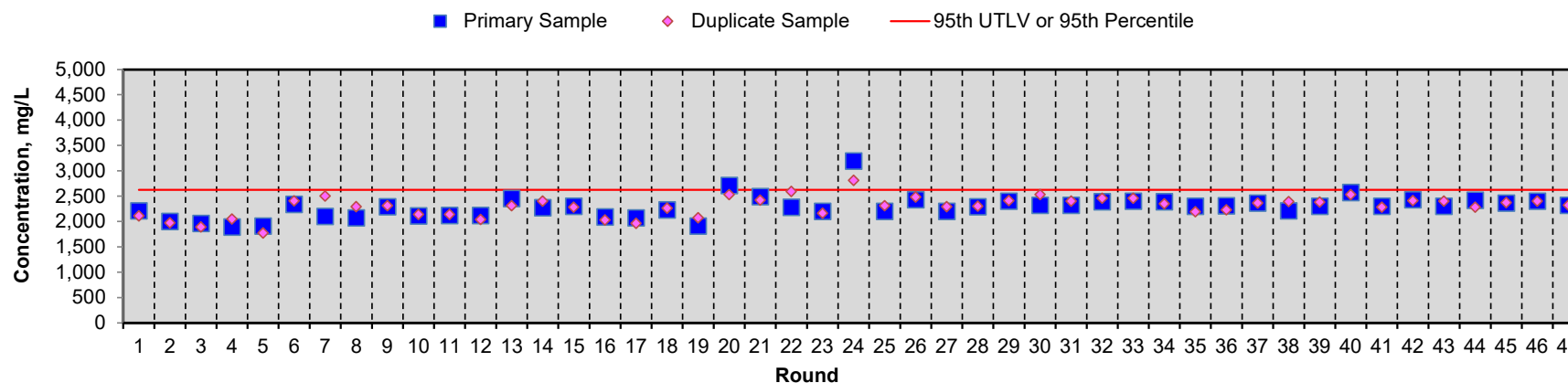
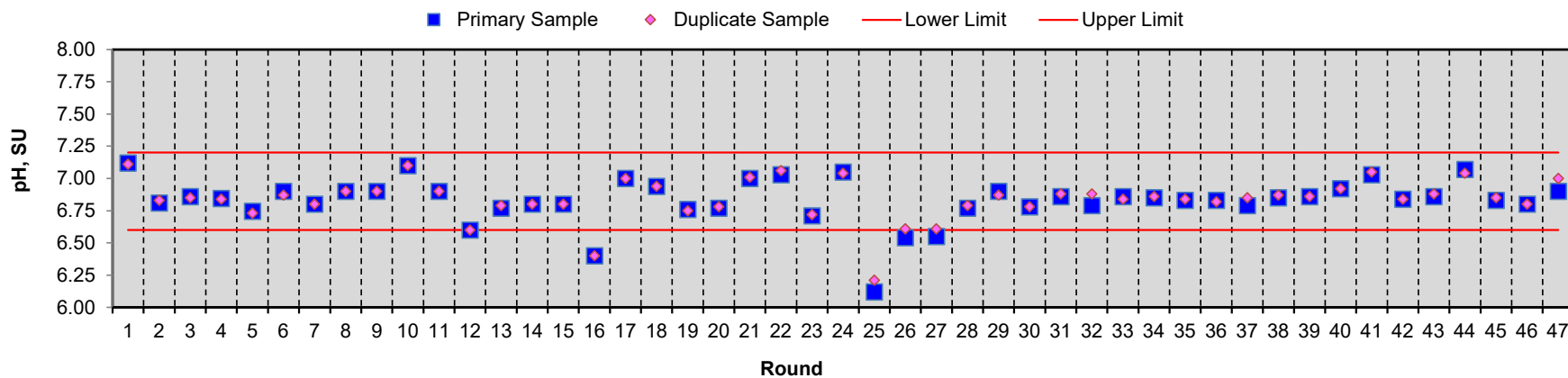


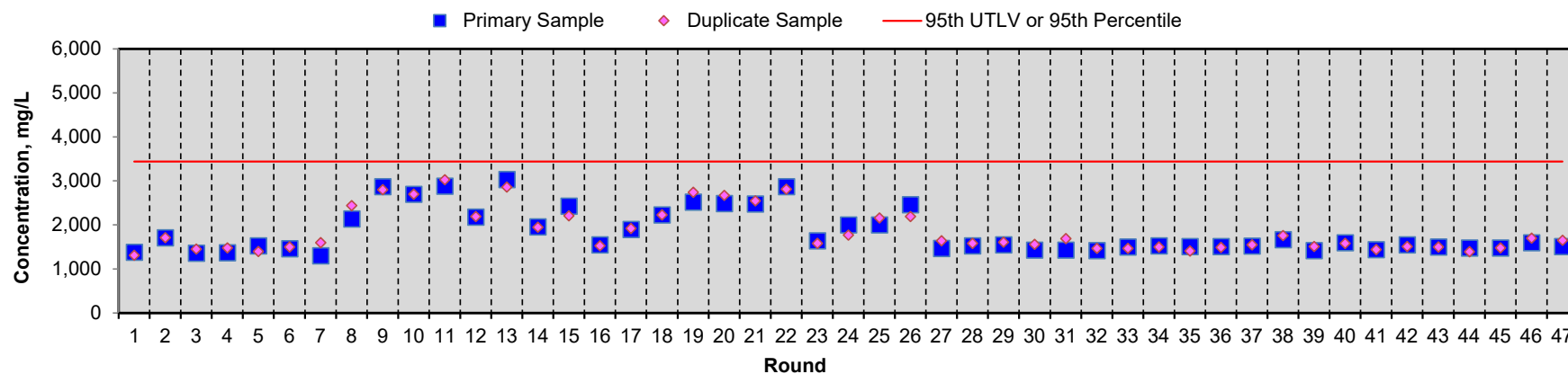
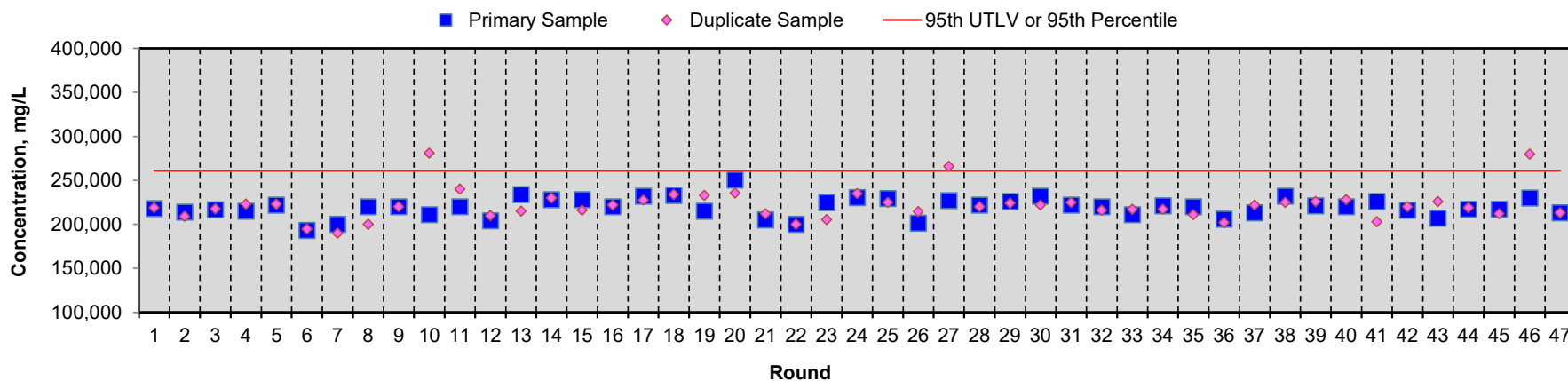
WQSP-2 pH

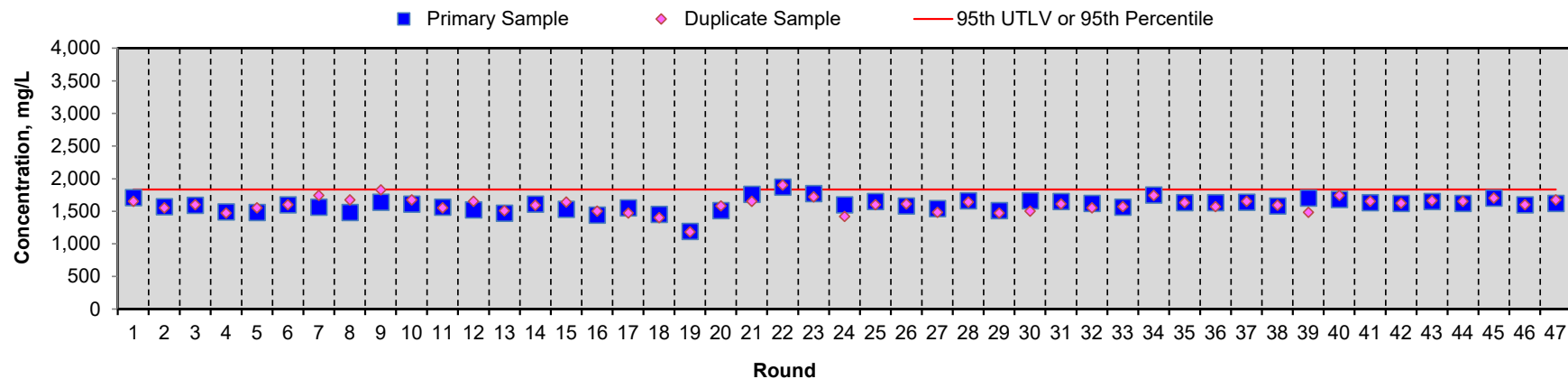
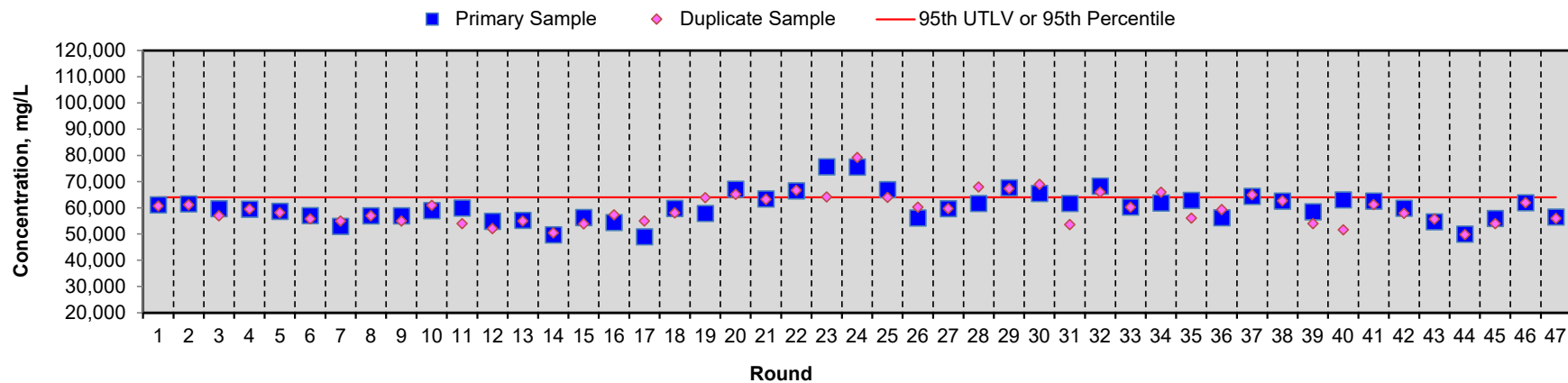


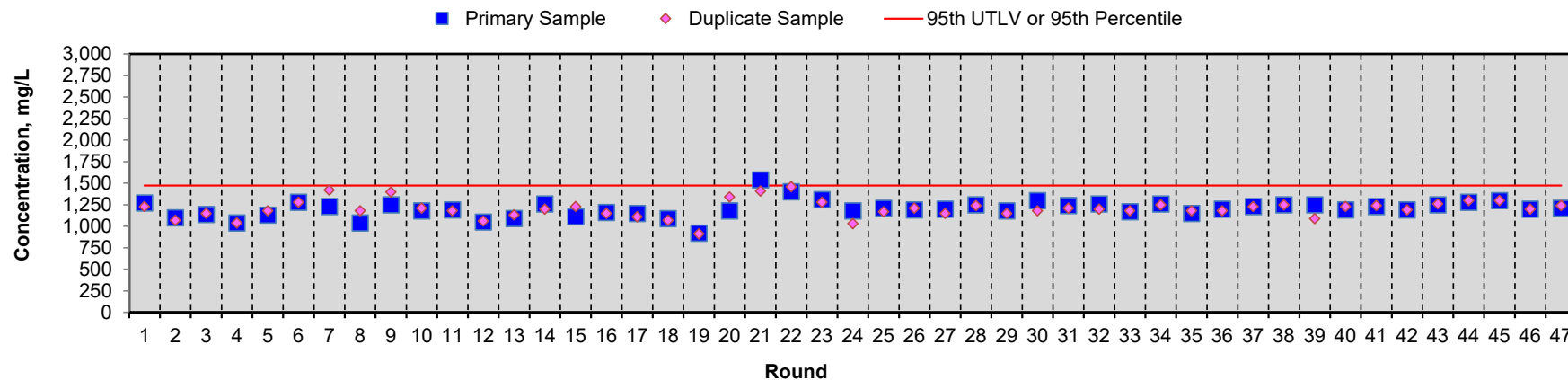
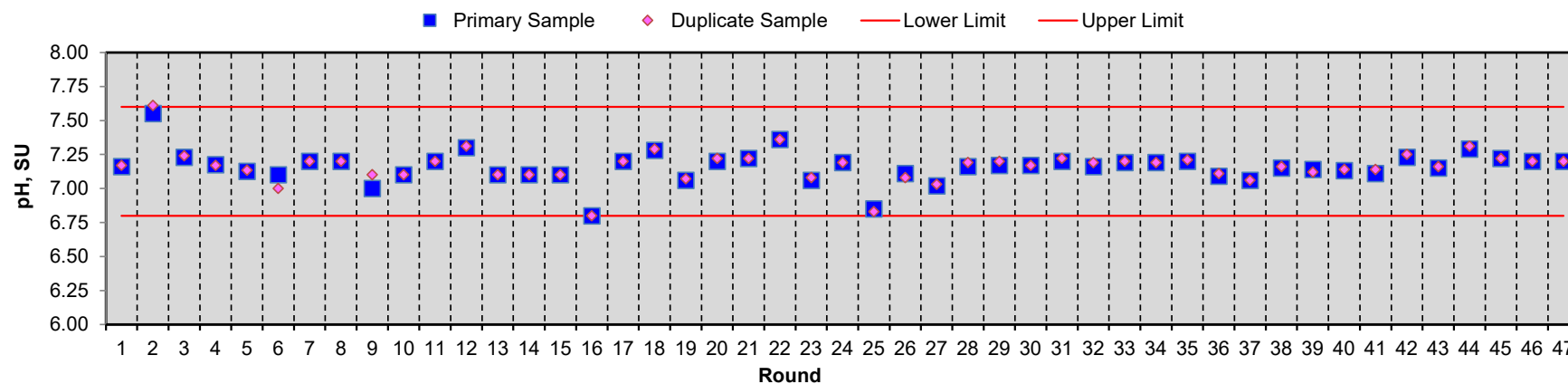
WQSP-2 Potassium, Dissolved**WQSP-2 Total Dissolved Solids**

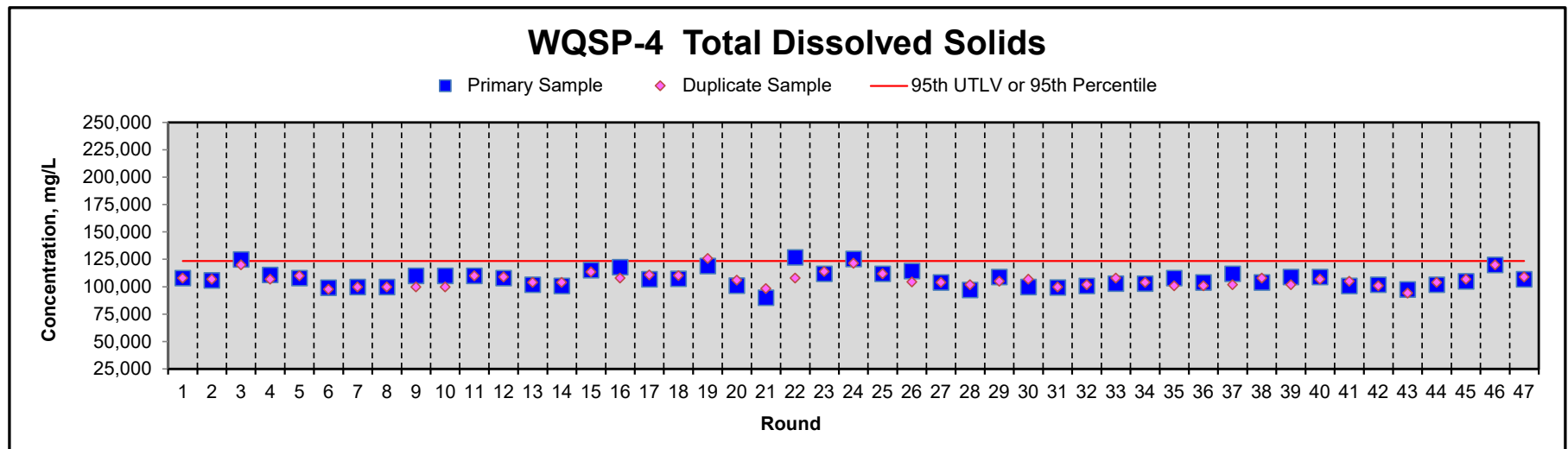
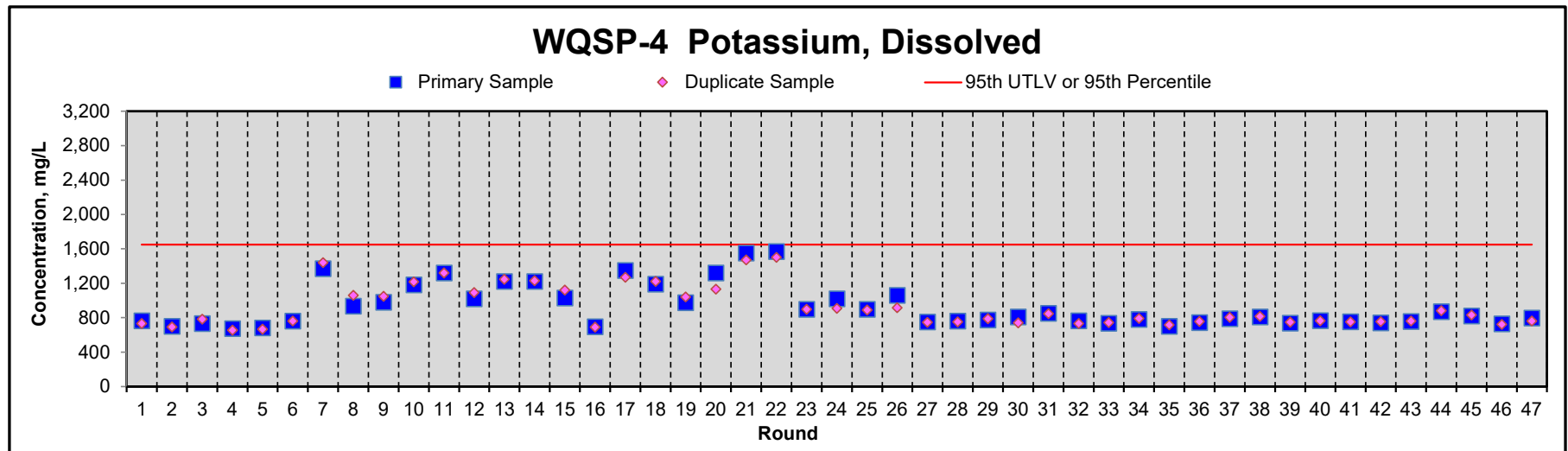
WQSP-3 Calcium, Dissolved**WQSP-3 Chloride**

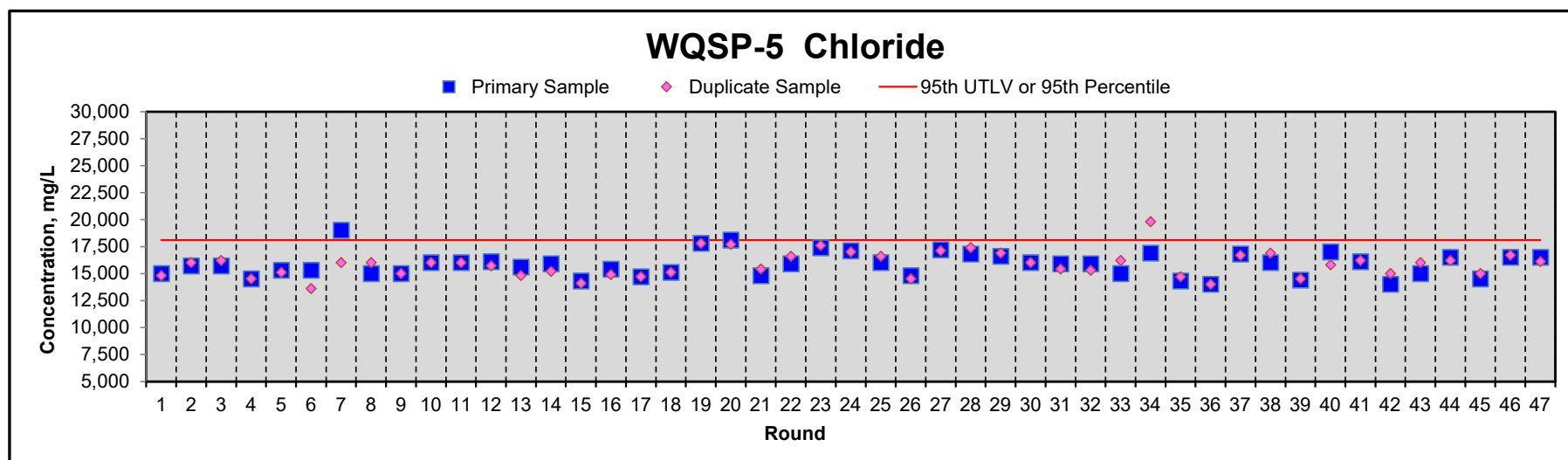
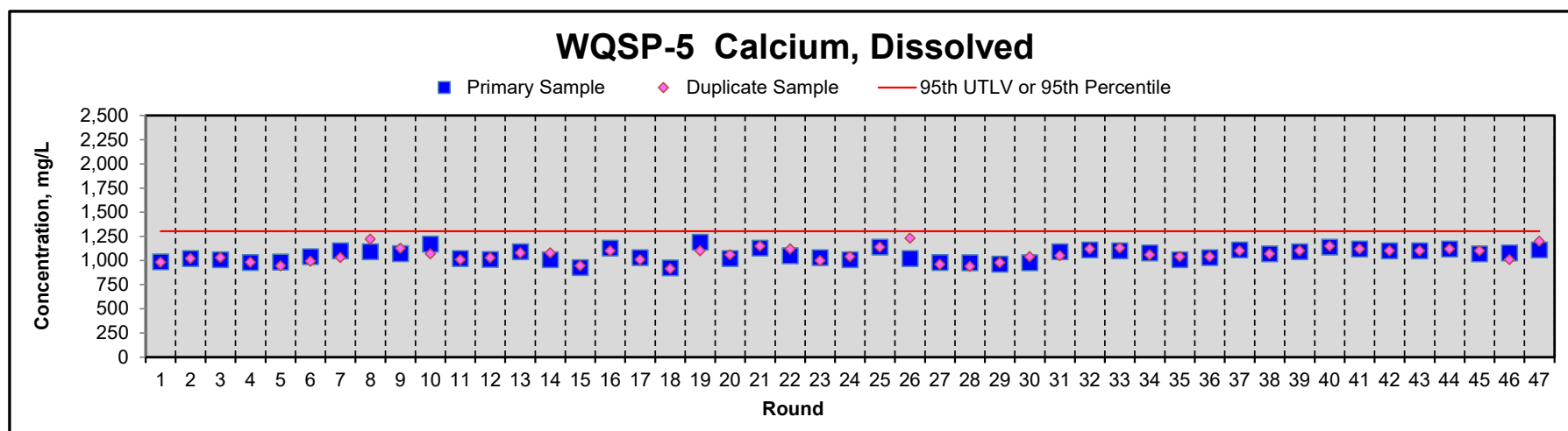
WQSP-3 Magnesium, Dissolved**WQSP-3 pH**

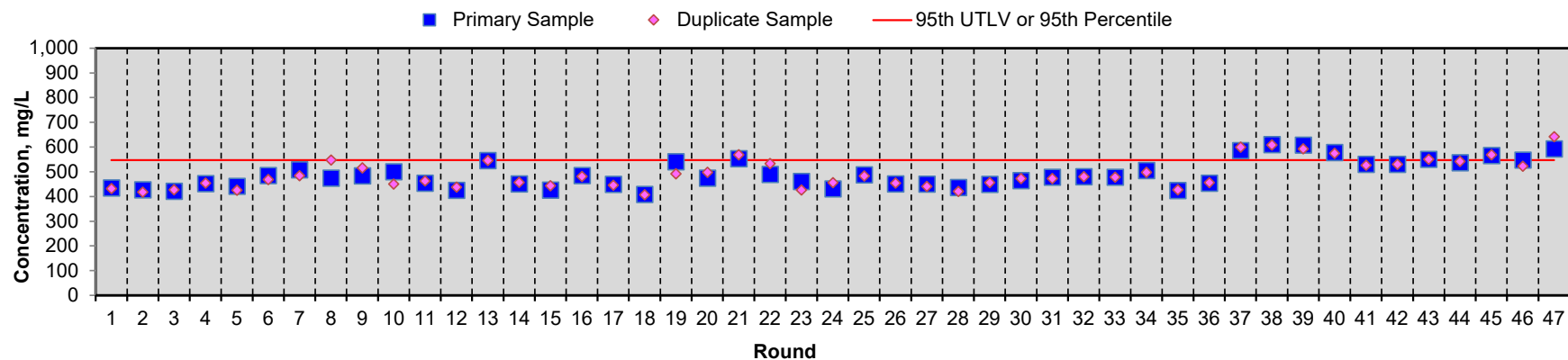
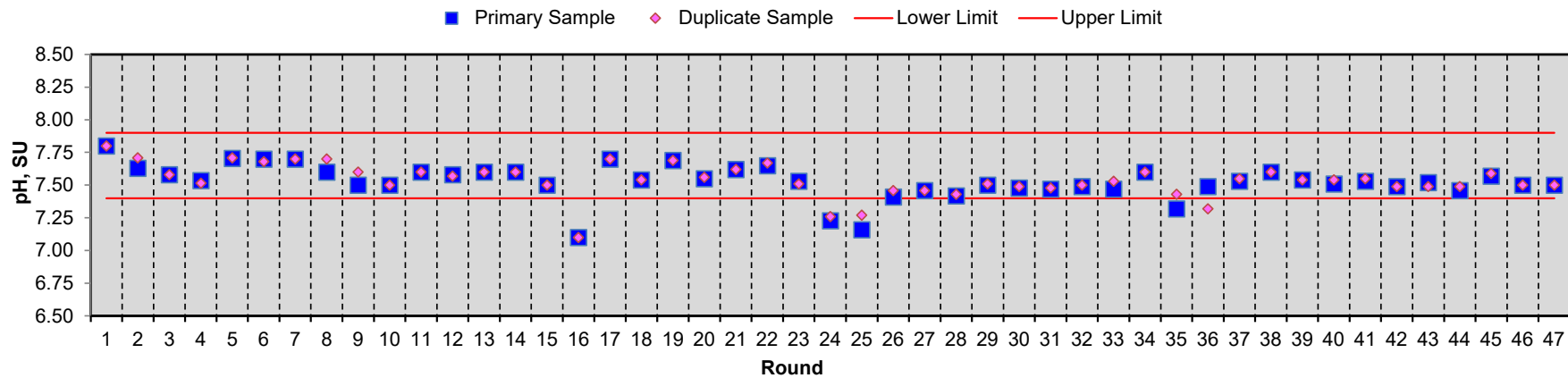
WQSP-3 Potassium, Dissolved**WQSP-3 Total Dissolved Solids**

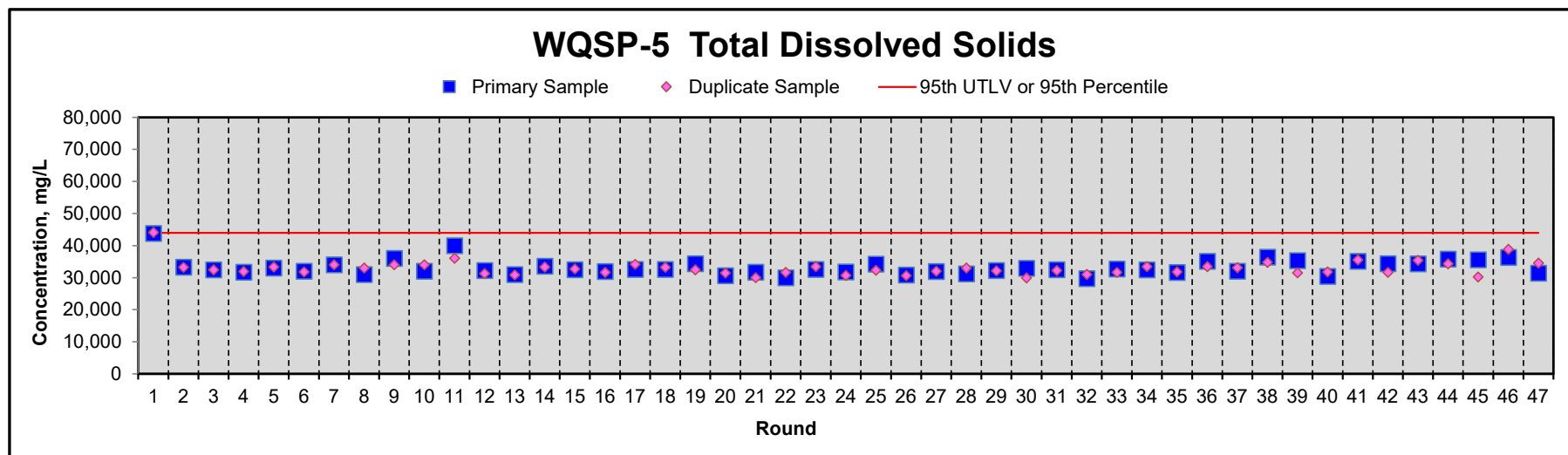
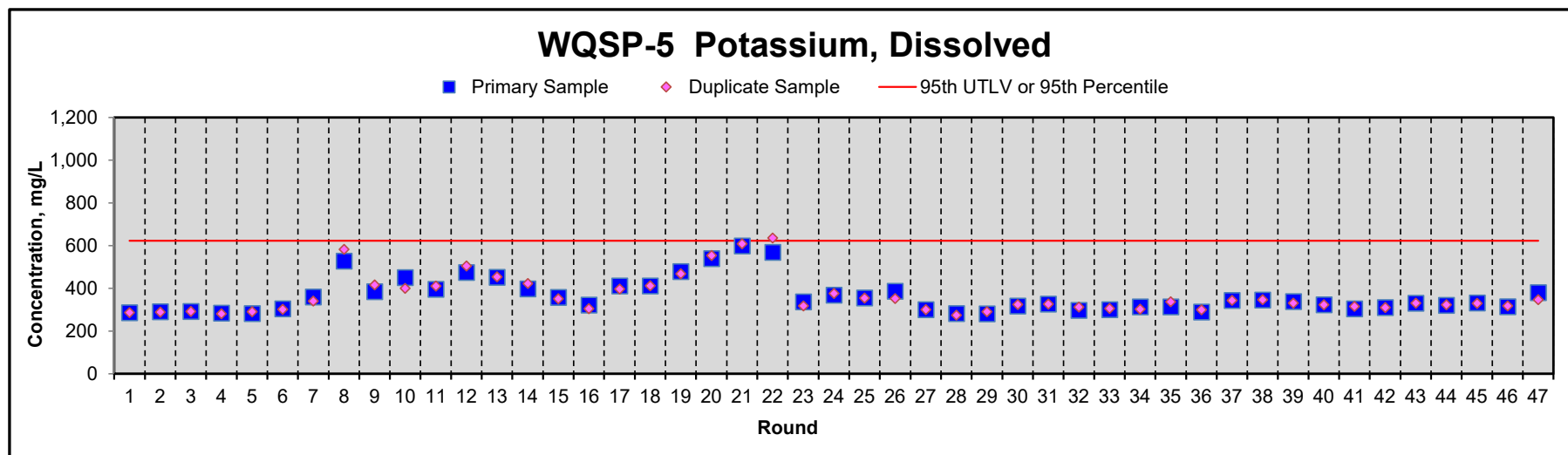
WQSP-4 Calcium, Dissolved**WQSP-4 Chloride**

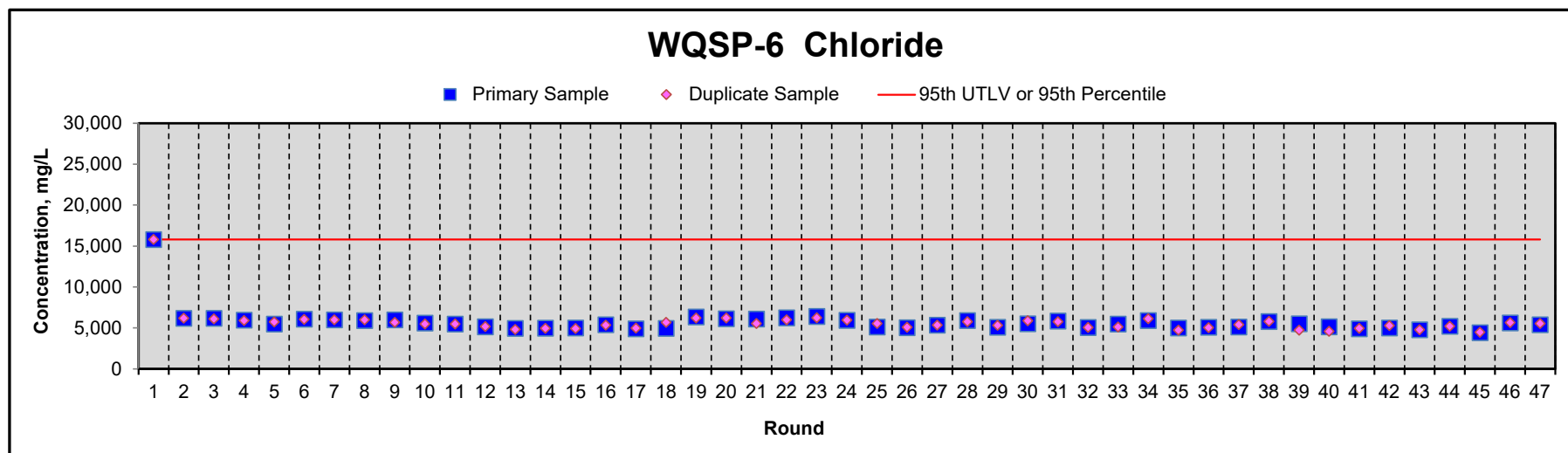
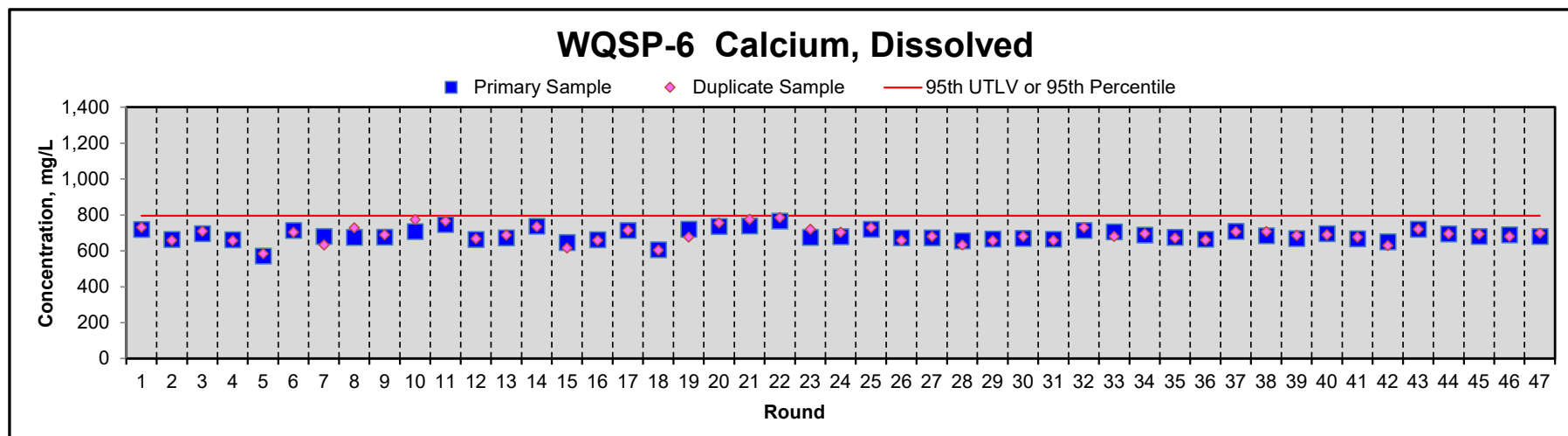
WQSP-4 Magnesium, Dissolved**WQSP-4 pH**

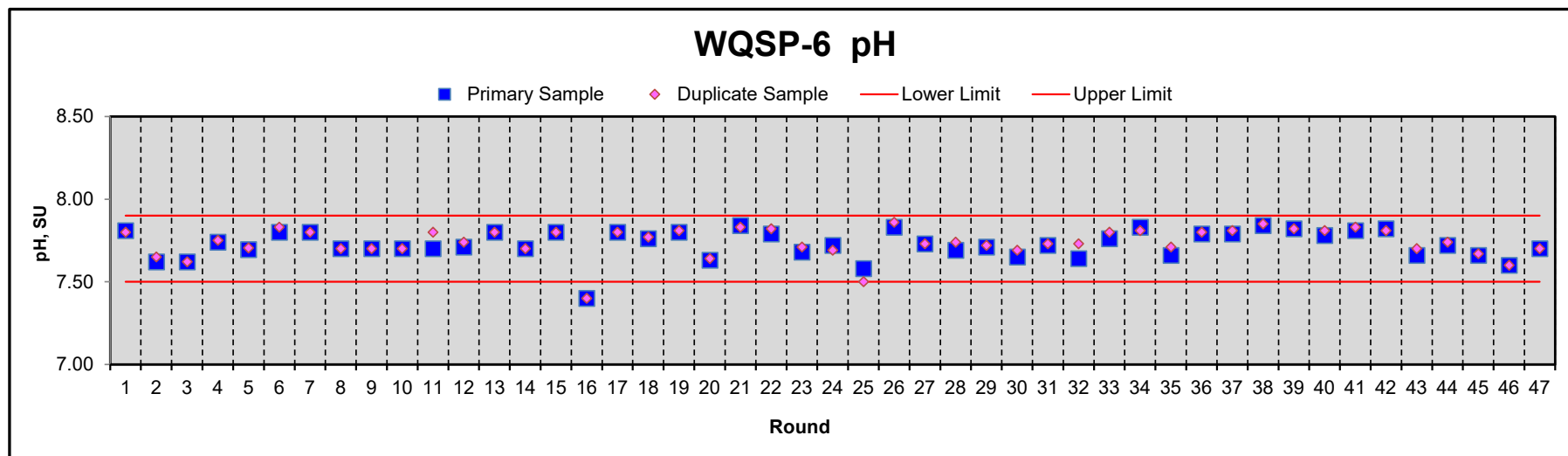
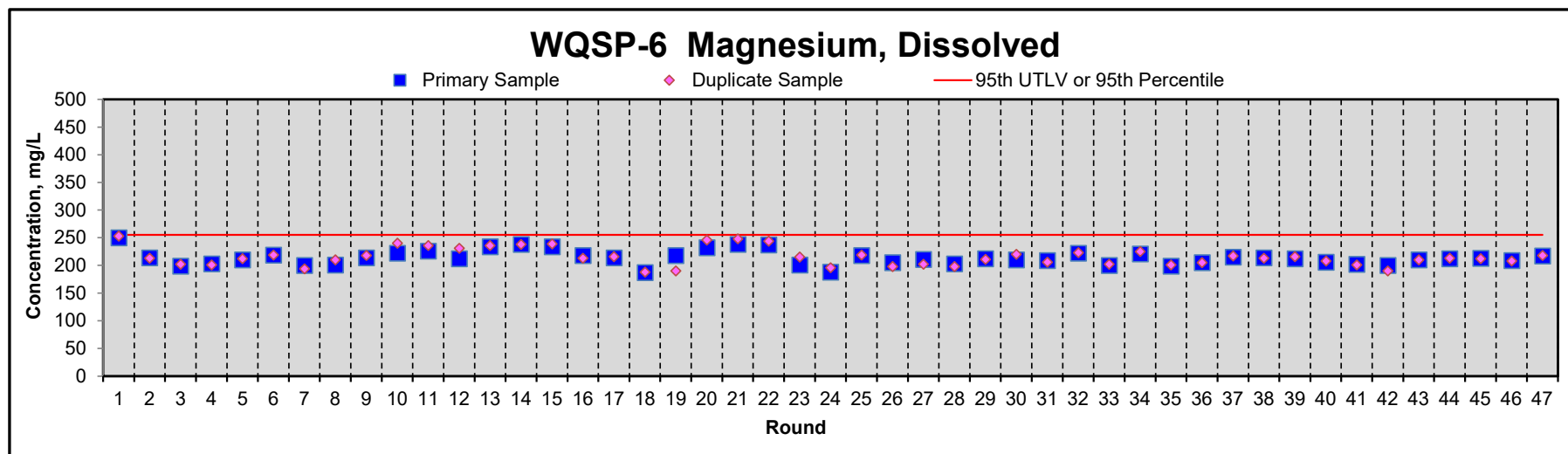


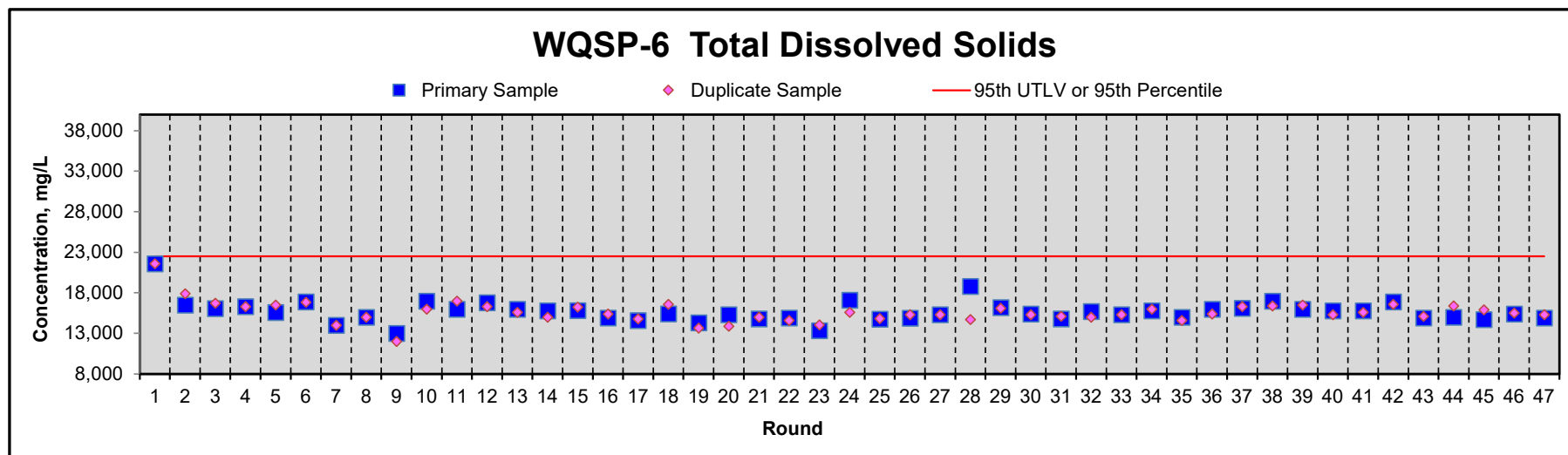
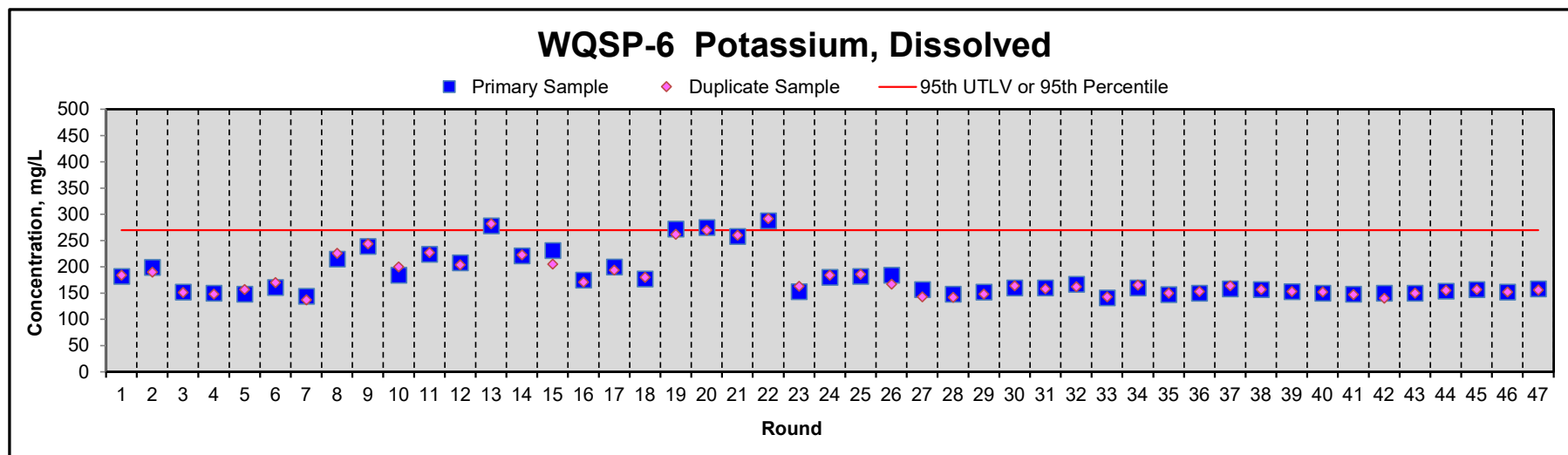


WQSP-5 Magnesium, Dissolved**WQSP-5 pH**









APPENDIX E - GROUNDWATER DATA TABLES

Table E.1 – Method Reporting Limits for Target Analytes

Compound ^a	MRL, µg/L	Trace Metal	MRL, mg/L
VOCs			
Isobutanol (Isobutyl Alcohol)	5.0	Antimony	0.025
Carbon tetrachloride	1.0	Arsenic	0.050
Chlorobenzene	1.0	Barium	0.020
Chloroform	1.0	Beryllium	0.010
1,1-Dichloroethane	1.0	Cadmium	0.010
1,2-Dichloroethane	1.0	Chromium	0.025
1,1-Dichloroethylene (1,1-Dichloroethene)	1.0	Lead	0.020
trans-1,2-Dichloroethylene (trans-1,2-DCE)	1.0	Mercury	0.0002
Methyl ethyl ketone (2-Butanone)	5.0	Nickel	0.025
Methylene chloride	5.0	Selenium	0.025
1,1,2,2-Tetrachloroethane	1.0	Silver	0.013
Tetrachloroethylene (Tetrachloroethene)	1.0	Thallium	0.025
1,1,1-Trichloroethane	1.0	Vanadium	0.025
1,1,2-Trichloroethane	1.0		
Toluene	1.0		
Trichloroethylene (Trichloroethene)	1.0		
Trichlorofluoromethane	1.0		
Vinyl chloride	1.0		
Xylenes (Xylenes, Total)	1.0		
SVOCs			
1,2-Dichlorobenzene	5.0		
1,4-Dichlorobenzene	5.0		
2,4-Dinitrophenol	5.0		
2,4-Dinitrotoluene	5.0		
Hexachlorobenzene	5.0		
Hexachloroethane	5.0		
2-Methylphenol ^b	5.0		
3-Methylphenol ^b	5.0		
4-Methylphenol ^b	5.0		
Nitrobenzene	5.0		
Pentachlorophenol	5.0		
Pyridine	5.0		
Note. µg/L = microgram per liter; mg/L = milligram per liter. a. Chemical synonyms used by the current analytical laboratory, Eurofins, are noted in parentheses. b. 2-, 3-, and 4-methylphenol are listed collectively as cresols in the Hazardous Waste Facility Permit.			

Table E.2 – DMP Results*(Refer to the end of the table for notes)*

WQSP-1					
Parameter and Units	Primary Result	Duplicate Result	Distribution Type^a	95th UTLV or 95th Percentile^a	Permit Table 5.6
WQSP-1 General Chemistry					
Specific Gravity (unitless) ^b	1.04	1.04	Normal	1.07	N/A
pH (standard units)	7.2	7.2	Lognormal	5.6 to 8.8	N/A
Specific Conductance (µmhos/cm)	134,000	136,000	Lognormal	175,000	N/A
Total Dissolved Solids (mg/L)	69,600	70,900	Lognormal	80,700	N/A
Total Organic Carbon (mg/L)	0.902	0.535	Nonparametric	<5.0	N/A
Total Suspended Solids (mg/L)	8.00	5.00	Nonparametric	33.3	N/A
WQSP-1 Trace Metals					
Antimony (mg/L)	ND (0.080)	ND (0.080)	Nonparametric	0.33	0.33
Arsenic (mg/L)	ND (0.050)	ND (0.050)	Nonparametric	<0.1	0.10
Barium (mg/L)	0.0254	0.0251	Nonparametric	<1.0	1.00
Beryllium (mg/L)	0.00535 J	0.00509 J	Nonparametric	<0.02	0.02
Cadmium (mg/L)	ND (0.012)	ND (0.012)	Nonparametric	<0.2	0.20
Chromium (mg/L)	ND (0.00575)	ND (0.00575)	Nonparametric	<0.5	0.50
Lead (mg/L) ^c	ND (0.06)	ND (0.06)	Nonparametric	0.105	0.11
Mercury (mg/L)	ND (0.00012)	ND (0.00012)	Nonparametric	<0.002	0.002
Nickel (mg/L)	ND (0.0182)	ND (0.0182)	Nonparametric	0.49	0.50
Selenium (mg/L)	ND (0.080)	ND (0.080)	Nonparametric	0.150	0.15
Silver (mg/L)	0.0650	0.0615	Nonparametric	<0.5	0.50
Thallium (mg/L)	ND (0.05)	ND (0.05)	Nonparametric	0.98	1.00
Vanadium (mg/L)	0.0331 J	0.0311 J	Nonparametric	<0.1	0.10
WQSP-1 Major Cations					
Calcium (mg/L)	1,830	1,750	Normal	2,087	N/A
Magnesium (mg/L)	1,190	1,140	Normal	1,247	N/A
Potassium (mg/L)	541	497	Lognormal	799	N/A
WQSP-1 Major Anions					
Chloride (mg/L)	40,300	38,900	Normal	40,472	N/A

^{a b c} Refer to footnotes at the end of the table.

WQSP-2					
Parameter and Units	Primary Result	Duplicate Result	Distribution Type^a	95th UTLV or 95th Percentile^b	Permit Table 5.6
WQSP-2 General Chemistry					
Specific Gravity (unitless) ^b	1.04	1.04	Lognormal	1.06	N/A
pH (standard units)	7.2	7.3	Normal	7.0 to 7.6	N/A
Specific Conductance (µmhos/cm)	129,000	129,000	Lognormal	124,000	N/A
Total Dissolved Solids (mg/L)	63,900	67,400	Normal	80,500	N/A
Total Organic Carbon (mg/L)	0.563 J	ND (0.459)	Nonparametric	7.97	N/A
Total Suspended Solids (mg/L)	29	29	Nonparametric	43.0	N/A
WQSP-2 Trace Metals					
Antimony (mg/L)	ND (0.08)	ND (0.08)	Nonparametric	<0.5	0.50
Arsenic (mg/L)	ND (0.05)	ND (0.05)	Nonparametric	0.062	0.06
Barium (mg/L)	0.0208	0.0218	Nonparametric	<1.0	1.00
Beryllium (mg/L)	0.0112 J	0.00707 J	Nonparametric	<1.0	1.00
Cadmium (mg/L)	ND (0.006)	ND (0.006)	Nonparametric	<0.5	0.50
Chromium (mg/L)	ND (0.0115)	ND (0.00575)	Nonparametric	<0.5	0.50
Lead (mg/L) ^c	ND (0.06)	ND (0.06)	Nonparametric	0.163	0.17
Mercury (mg/L)	ND (0.0006)	ND (0.000120)	Nonparametric	<0.002	0.002
Nickel (mg/L)	ND (0.0364)	0.0328 J	Nonparametric	0.370	0.50
Selenium (mg/L)	ND (0.08)	ND (0.08)	Nonparametric	0.150	0.15
Silver (mg/L)	0.0780	0.0733	Nonparametric	<0.5	0.50
Thallium (mg/L)	ND (0.05)	ND (0.05)	Nonparametric	0.980	1.00
Vanadium (mg/L)	0.0633 J	0.0352 J	Nonparametric	<0.1	0.10
WQSP-2 Major Cations					
Calcium (mg/L)	1,600	1,690	Lognormal	1,827	N/A
Magnesium (mg/L)	1090	1,180	Normal	1,244	N/A
Potassium (mg/L)	590	559	Lognormal	845	N/A
WQSP-2 Major Anions					
Chloride (mg/L)	37,700	37,000	Normal	39,670	N/A

^{a b c} Refer to footnotes at the end of the table.

WQSP-3					
Parameter and Units	Primary Result	Duplicate Result	Distribution Type ^a	95th UTLV or 95th Percentile ^a	Permit Table 5.6
WQSP-3 General Chemistry					
Specific Gravity (unitless) ^b	1.14	1.14	Normal	1.17	N/A
pH (standard units)	6.9	7.0	Lognormal	6.6 to 7.2	N/A
Specific Conductance (µmhos/cm)	439,000	435,000	Normal	517,000	N/A
Total Dissolved Solids (mg/L)	213,000	213,000	Lognormal	261,000	N/A
Total Organic Carbon (mg/L)	0.583	0.534	Nonparametric	<5.0	N/A
Total Suspended Solids (mg/L)	113	115	Nonparametric	107	N/A
WQSP-3 Trace Metals					
Antimony (mg/L)	ND (0.16)	ND (0.16)	Nonparametric	<1.0	1.00
Arsenic (mg/L) ^c	ND (0.1)	ND (0.1)	Nonparametric	<1.0	0.21
Barium (mg/L)	0.0268	0.0331	Nonparametric	<1.0	1.00
Beryllium (mg/L)	0.0109 J	0.0116 J	Nonparametric	<0.1	0.10
Cadmium (mg/L)	ND (0.00606)	ND (0.00606)	Nonparametric	<0.5	0.50
Chromium (mg/L)	ND (0.00575)	ND (0.00575)	Nonparametric	<2.0	2.00
Lead (mg/L)	ND (0.6)	ND (0.6)	Nonparametric	0.800	0.80
Mercury (mg/L)	ND (0.0006)	ND (0.00012)	Nonparametric	<0.002	0.002
Nickel (mg/L)	ND (0.0182)	ND (0.0182)	Nonparametric	<5.0	5.00
Selenium (mg/L)	ND (0.16)	ND (0.16)	Nonparametric	<2.0	2.00
Silver (mg/L)	0.0628	0.0682	Nonparametric	0.31	0.31
Thallium (mg/L)	ND (0.5)	ND (0.5)	Nonparametric	5.8	5.80
Vanadium (mg/L)	0.0505 J	0.0572 J	Nonparametric	<5.0	5.00
WQSP-3 Major Cations					
Calcium (mg/L)	1,510	1,500	Normal	1,680	N/A
Magnesium (mg/L)	2,320	2,320	Lognormal	2,625	N/A
Potassium (mg/L)	1,510	1,650	Lognormal	3,438	N/A
WQSP-3 Major Anions					
Chloride (mg/L)	134,000	132,000	Lognormal	149,100	N/A

^{a b c} Refer to footnotes at the end of the table.

WQSP-4					
Parameter and Units	Primary Result	Duplicate Result	Distribution Type ^a	95th UTLV or 95th Percentile ^a	Permit Table 5.6
WQSP-4 General Chemistry					
Specific Gravity (unitless) ^b	1.07	1.07	Lognormal	1.09	N/A
pH (standard units)	7.2	7.2	Lognormal	6.8 to 7.6	N/A
Specific Conductance (µmhos/cm)	197,000	204,000	Lognormal	319,800	N/A
Total Dissolved Solids (mg/L)	107,000	109,000	Normal	123,500	N/A
Total Organic Carbon (mg/L)	0.895	0.528	Nonparametric	<5.0	N/A
Total Suspended Solids (mg/L)	48.7	26.2	Nonparametric	57.0	N/A
WQSP-4 Trace Metals					
Antimony (mg/L)	ND (0.08)	ND (0.08)	Nonparametric	<10.0	0.80
Arsenic (mg/L)	ND (0.05)	ND (0.05)	Nonparametric	<0.5	0.50
Barium (mg/L)	0.0256	0.0262	Nonparametric	1.00	1.00
Beryllium (mg/L)	0.00555 J	0.00496 J	Nonparametric	0.25	0.25
Cadmium (mg/L)	ND (0.00606)	ND (0.00606)	Nonparametric	<0.5	0.50
Chromium (mg/L)	ND (0.00575)	ND (0.00575)	Nonparametric	<2.0	2.00
Lead (mg/L)	ND (0.12)	ND (0.12)	Nonparametric	0.525	0.53
Mercury (mg/L)	ND (0.0006)	ND (0.00012)	Nonparametric	<0.002	0.002
Nickel (mg/L)	ND (0.0182)	ND (0.0182)	Nonparametric	<5.0	5.00
Selenium (mg/L)	ND (0.08)	ND (0.08)	Nonparametric	2.009	2.00
Silver (mg/L)	0.0567	0.0611	Nonparametric	0.519	0.52
Thallium (mg/L)	ND (0.1)	ND (0.1)	Nonparametric	1.00	1.00
Vanadium (mg/L)	0.0326 J	0.0314 J	Nonparametric	<5.0	5.00
WQSP-4 Major Cations					
Calcium (mg/L)	1,620	1,670	Lognormal	1,834	N/A
Magnesium (mg/L)	1,210	1,240	Lognormal	1,472	N/A
Potassium (mg/L)	796	761	Lognormal	1,648	N/A
WQSP-4 Major Anions					
Chloride (mg/L)	56,500	56,000	Normal	63,960	N/A

^{a b} Refer to footnotes at the end of the table.

WQSP-5					
Parameter and Units	Primary Result	Duplicate Result	Distribution Type^a	95th UTLV or 95th Percentile^a	Permit Table 5.6
WQSP-5 General Chemistry					
Specific Gravity (unitless) ^b	1.02	1.02	Normal	1.04	N/A
pH (standard units)	7.5	7.5	Normal	7.4 to 7.9	N/A
Specific Conductance (µmhos/cm)	66,500	66,300	Lognormal	67,700	N/A
Total Dissolved Solids (mg/L)	31,400	34,500	Nonparametric	43,950	N/A
Total Organic Carbon (mg/L)	ND	ND	Nonparametric	<5.0	N/A
Total Suspended Solids (mg/L)	6.30	4.60	Nonparametric	<10.0	N/A
WQSP-5 Total Trace Metals					
Antimony (mg/L)	ND (0.08)	ND (0.08)	Nonparametric	0.073	0.07
Arsenic (mg/L)	ND (0.05)	ND (0.05)	Nonparametric	<0.5	0.50
Barium (mg/L)	0.0165	0.0126	Nonparametric	<1.0	1.00
Beryllium (mg/L)	0.00406 J	0.00354 J	Nonparametric	<0.02	0.02
Cadmium (mg/L) ^c	ND (0.00606)	ND (0.00606)	Nonparametric	<0.05	0.05
Chromium (mg/L)	ND (0.00575)	ND (0.00575)	Nonparametric	<0.5	0.50
Lead (mg/L) ^c	ND (0.06)	ND (0.06)	Nonparametric	<0.05	0.05
Mercury (mg/L)	ND (0.00012)	ND (0.00012)	Nonparametric	<0.002	0.002
Nickel (mg/L)	ND (0.0182)	ND (0.0182)	Nonparametric	<0.1	0.10
Selenium (mg/L)	ND (0.08)	ND (0.08)	Nonparametric	<0.1	0.10
Silver (mg/L)	0.0423	0.0292	Nonparametric	<0.5	0.50
Thallium (mg/L)	ND (0.05)	ND (0.05)	Nonparametric	0.209	0.21
Vanadium (mg/L)	0.0219 J	0.0219 J	Nonparametric	2.70	2.70
WQSP-5 Major Cations					
Calcium (mg/L)	1,110	1,200	Lognormal	1,303	N/A
Magnesium (mg/L)	592	642	Nonparametric	547	N/A
Potassium (mg/L)	380	347	Lognormal	622	N/A
WQSP-5 Major Anions					
Chloride (mg/L)	16,500	16,100	Lognormal	18,100	N/A

^{a b c} Refer to footnotes at the end of the table.

WQSP-6					
Parameter and Units	Primary Result	Duplicate Result	Distribution Type^a	95th UTLV or 95th Percentile^a	Permit Table 5.6
WQSP-6 General Chemistry					
Specific Gravity (unitless) ^b	1.01	1.01	Normal	1.02	N/A
pH (standard units)	7.7	7.7	Normal	7.5 to 7.9	N/A
Specific Conductance (µmhos/cm)	30,900	30,900	Lognormal	27,660	N/A
Total Dissolved Solids (mg/L)	14,900	15,300	Lognormal	22,500	N/A
Total Organic Carbon (mg/L)	0.989	0.751	Nonparametric	10.14	N/A
Total Suspended Solids (mg/L)	12	7.90	Nonparametric	14.8	N/A
WQSP-6 Trace Metals					
Antimony (mg/L)	ND (0.08)	ND (0.08)	Nonparametric	0.140	0.14
Arsenic (mg/L)	ND (0.05)	ND (0.05)	Nonparametric	<0.5	0.50
Barium (mg/L)	0.00933	0.00911	Nonparametric	<1.0	1.00
Beryllium (mg/L)	0.00137 J	0.00147 J	Nonparametric	<0.02	0.02
Cadmium (mg/L)	ND (0.00121)	ND (0.00121)	Nonparametric	<0.05	0.05
Chromium (mg/L)	ND (0.00115)	ND (0.00115)	Nonparametric	<0.5	0.50
Lead (mg/L)	ND (0.06)	ND (0.06)	Nonparametric	0.150	0.15
Mercury (mg/L)	ND (0.00012)	ND (0.00012)	Nonparametric	<0.002	0.002
Nickel (mg/L)	ND (0.00364)	ND (0.00364)	Nonparametric	<0.5	0.50
Selenium (mg/L)	ND (0.0800)	ND (0.0800)	Nonparametric	0.10	0.10
Silver (mg/L)	0.0223	0.0215	Nonparametric	<0.5	0.50
Thallium (mg/L)	ND (0.05)	ND (0.05)	Nonparametric	0.560	0.56
Vanadium (mg/L)	0.00659 J	0.00642 J	Nonparametric	0.070	0.10
WQSP-6 Major Cations					
Calcium (mg/L)	681	698	Normal	796	N/A
Magnesium (mg/L)	217	218	Lognormal	255	N/A
Potassium (mg/L)	158	156	Lognormal	270	N/A
WQSP-6 Major Anions					
Chloride (mg/L)	5,420	5,540	Nonparametric	15,800	N/A

^{a b} Refer to footnotes at the end of the table

Notes:

Note: Values (concentrations) in **bold** font exceed or are outside of the baseline range for the 95th UTLV, 95th percentile, or Permit background groundwater quality value. In these cases, the UTLVs, 95th percentile, or Permit background groundwater quality values are also shown in **bold** font for easy comparison.

- a. Baseline sample distribution type based on Rounds 1 to 10. The 95th UTLV is used in cases where the sample distribution type is normal or lognormal. The 95th percentile value is used in cases where the sample distribution type is nonparametric or has greater than 15 percent non-detects.
- b. Specific gravity is equivalent to density (g/mL) as presented in *Waste Isolation Pilot Plant RCRA Background Groundwater Quality Baseline Report, Addendum 1* (IT, 2000).
- c. Some results reported as non-detects had MDLs that were higher than the baseline range for the 95th UTLV, 95th percentile, or Permit background groundwater quality value.

J = Estimated concentration. The concentration is between the laboratory's MDL and the MRL.

N/A = Not applicable

ND = Non-detect; the analytical parameter was analyzed but not detected in the sample. Most metals were analyzed by inductively coupled plasma spectroscopy (ICP). Antimony, arsenic, selenium, and thallium were analyzed by ICP/mass spectrometry (ICP/MS). The MDLs are shown in parentheses.

95th UTLV = Upper tolerance limit value in unit associated with represented parameter (coverage and tolerance coefficient value of 95 percent).

Table E.3 – WIPP Well Inventory*(Refer to the end of the table for zone descriptions)*

Sorted by Well Name				Sorted by Zone			
Count	Well Name	Zone	Comments	Count	Well Name	Zone	Reason Not Assessed for Long-Term Water Level Trend in Culebra
1	AEC-7R	CUL		1	CB-1	B/C	
2	C-2505	SR/DL		2	DOE-2	B/C	
3	C-2506	SR/DL		3	AEC-7R	CUL	
4	C-2507	SR/DL		4	C-2737	CUL	
5	C-2737	CUL		5	H-4bR	CUL	
6	C-2737	MAG		6	H-5bR	CUL	
7	C-2811	SR/DL		7	H-6bR	CUL	
8	CB-1	B/C		8	H-9bR	CUL	
9	DOE-2	B/C		9	H-10cR	CUL	
10	H-2b1	MAG		10	H-11b4R	CUL	
11	H-3b1	MAG		11	H-12R	CUL	
12	H-4bR	CUL		12	H-19b0	CUL	
13	H-4c	MAG		13	H-19b2	CUL	Redundant to H-19b0
14	H-5bR	CUL		14	H-19b3	CUL	Redundant to H-19b0
15	H-6bR	CUL		15	H-19b4	CUL	Redundant to H-19b0
16	H-6c	MAG		16	H-19b5	CUL	Redundant to H-19b0
17	H-8a	MAG		17	H-19b6	CUL	Redundant to H-19b0
18	H-9c	MAG		18	H-19b7	CUL	Redundant to H-19b0
19	H-9bR	CUL		19	IMC-461	CUL	
20	H-10a	MAG		20	SNL-1	CUL	

Sorted by Well Name				Sorted by Zone			
Count	Well Name	Zone	Comments	Count	Well Name	Zone	Reason Not Assessed for Long-Term Water Level Trend in Culebra
21	H-10cR	CUL		21	SNL-2	CUL	
22	H-11b2	MAG		22	SNL-3	CUL	
23	H-11b4R	CUL		23	SNL-5	CUL	
24	H-12R	CUL		24	SNL-6	CUL	Long term recovery
25	H-14	MAG		25	SNL-8	CUL	
26	H-15R	CUL		26	SNL-9	CUL	
27	H-15	MAG		27	H-15R	CUL	
28	H-16	CUL		28	SNL-10	CUL	
29	H-18	MAG		29	H-16	CUL	
30	H-19b0	CUL		30	SNL-12	CUL	
31	H-19b2	CUL		31	SNL-13	CUL	
32	H-19b3	CUL		32	SNL-14	CUL	
33	H-19b4	CUL		33	SNL-15	CUL	Long term recovery
34	H-19b5	CUL		34	SNL-16	CUL	
35	H-19b6	CUL		35	SNL-17	CUL	
36	H-19b7	CUL		36	SNL-18	CUL	
37	IMC-461	CUL		37	SNL-19	CUL	
38	SNL-1	CUL		38	WIPP-11R	CUL	
39	SNL-2	CUL		39	WQSP-1	CUL	
40	SNL-3	CUL		40	WQSP-2	CUL	
41	SNL-5	CUL		41	WQSP-3	CUL	
42	SNL-6	CUL		42	WQSP-4	CUL	
43	SNL-8	CUL		43	WQSP-5	CUL	
44	SNL-9	CUL		44	WQSP-6	CUL	

Sorted by Well Name				Sorted by Zone			
Count	Well Name	Zone	Comments	Count	Well Name	Zone	Reason Not Assessed for Long-Term Water Level Trend in Culebra
45	SNL-10	CUL		45	WQSP-6A	DL	
46	SNL-12	CUL		46	PZ-17b	DL	
47	SNL-13	CUL		47	PZ-15	GAT	
48	SNL-14	CUL		48	H-2b1	MAG	
49	SNL-15	CUL		49	H-3b1	MAG	
50	SNL-16	CUL		50	H-4c	MAG	
51	SNL-17	CUL		51	H-6c	MAG	
52	SNL-18	CUL		52	H-8a	MAG	
53	SNL-19	CUL		53	H-9c	MAG	
54	PZ-1	SR/DL		54	H-10a	MAG	
55	PZ-2	SR/DL		55	H-11b2	MAG	
56	PZ-3	SR/DL		56	H-14	MAG	
57	PZ-4	SR/DL		57	H-18	MAG	
58	PZ-5	SR/DL		58	WIPP-18	MAG	
59	PZ-6	SR/DL		59	H-15	MAG	
60	PZ-7	SR/DL		60	C-2737	MAG	
61	PZ-9	SR/DL		61	C-2505	SR/DL	
62	PZ-10	SR/DL		62	C-2506	SR/DL	
63	PZ-11	SR/DL		63	C-2507	SR/DL	
64	PZ-12	SR/DL		64	C-2811	SR/DL	
65	PZ-13	SR/DL		65	PZ-1	SR/DL	
66	PZ-14	SR/DL		66	PZ-2	SR/DL	
67	PZ-15	GAT		67	PZ-3	SR/DL	
68	PZ-16	SR/DL	Drilled June 2020	68	PZ-4	SR/DL	

Sorted by Well Name				Sorted by Zone			
Count	Well Name	Zone	Comments	Count	Well Name	Zone	Reason Not Assessed for Long-Term Water Level Trend in Culebra
69	PZ-17a	SR/DL	Drilled July 2020	69	PZ-5	SR/DL	
70	PZ-17b	DL	Drilled July 2020	70	PZ-6	SR/DL	
71	PZ-18	SR/DL	Drilled June 2020	71	PZ-7	SR/DL	
72	PZ-19	SR/DL	Drilled July 2020	72	PZ-9	SR/DL	
73	WIPP-11R	CUL	Drilled in Sept 2019	73	PZ-10	SR/DL	
74	WIPP-18	MAG		74	PZ-11	SR/DL	
75	WQSP-1	CUL		75	PZ-12	SR/DL	
76	WQSP-2	CUL		76	PZ-13	SR/DL	
77	WQSP-3	CUL		77	PZ-14	SR/DL	
78	WQSP-4	CUL		78	PZ-16	SR/DL	
79	WQSP-5	CUL		79	PZ-17a	SR/DL	
80	WQSP-6	CUL		80	PZ-18	SR/DL	
81	WQSP-6A	DL		81	PZ-19a	SR/DL	

Zones:

B/C = Bell Canyon

CUL = Culebra

DL = Dewey Lake

GAT = Gatuña

MAG = Magenta

SR/DL = Santa Rosa/Dewey Lake

Table E.4 – Water Levels*(Refer to the end of the table for zone descriptions)*

Well	Zone	Date	Adjusted Depth to Water ^a	Water Level Elevation (ft AMSL)	Adjusted Freshwater Head (ft AMSL)
AEC-7R	CUL	01/08/25	614.80	3,043.55	3,062.45
AEC-7R	CUL	02/04/25	614.16	3,044.19	3,063.14
AEC-7R	CUL	03/04/25	614.00	3,044.35	3,063.31
AEC-7R	CUL	04/02/25	615.06	3,043.29	3,062.17
AEC-7R	CUL	05/05/25	615.70	3,042.65	3,061.49
AEC-7R	CUL	06/03/25	614.75	3,043.60	3,062.51
AEC-7R	CUL	07/14/25	613.94	3,044.41	3,063.38
AEC-7R	CUL	08/05/25	613.77	3,044.58	3,063.56
AEC-7R	CUL	09/09/25	613.65	3,044.70	3,063.69
AEC-7R	CUL	10/07/25	613.49	3,044.86	3,063.86
AEC-7R	CUL	11/05/25	613.49	3,044.86	3,063.86
AEC-7R	CUL	12/09/25	613.38	3,044.97	3,063.98
C-2737 (PIP)	CUL	01/14/25	436.83	2,963.93	2,971.56
C-2737 (PIP)	CUL	02/04/25	436.63	2,964.13	2,971.76
C-2737 (PIP)	CUL	03/05/25	436.70	2,964.06	2,971.69
C-2737 (PIP)	CUL	04/01/25	436.51	2,964.25	2,971.89
C-2737 (PIP)	CUL	05/05/25	436.83	2,963.93	2,971.56
C-2737 (PIP)	CUL	06/04/25	437.31	2,963.45	2,971.06
C-2737 (PIP)	CUL	07/01/25	435.64	2,965.12	2,972.78
C-2737 (PIP)	CUL	08/06/25	430.57	2,970.19	2,978.00
C-2737 (PIP)	CUL	09/10/25	426.85	2,973.91	2,981.84
C-2737 (PIP)	CUL	10/08/25	424.85	2,975.91	2,983.90
C-2737 (PIP)	CUL	11/05/25	421.01	2,979.75	2,987.85
C-2737 (PIP)	CUL	12/02/25	418.94	2,981.82	2,989.98
H-4bR	CUL	01/07/25	343.85	2,990.79	2,994.40
H-4bR	CUL	02/05/25	342.91	2,991.73	2,995.36
H-4bR	CUL	03/03/25	342.31	2,992.33	2,995.97
H-4bR	CUL	04/01/25	342.45	2,992.19	2,995.83
H-4bR	CUL	05/01/25	342.80	2,991.84	2,995.47
H-4bR	CUL	06/02/25	343.00	2,991.64	2,995.27
H-4bR	CUL	07/09/25	342.81	2,991.83	2,995.46
H-4bR	CUL	08/04/25	342.03	2,992.61	2,996.26
H-4bR	CUL	09/08/25	342.39	2,992.25	2,995.89
H-4bR	CUL	10/06/25	342.51	2,992.13	2,995.77
H-4bR	CUL	11/04/25	342.78	2,991.86	2,995.49
H-4bR	CUL	12/08/25	342.16	2,992.48	2,996.13

Well	Zone	Date	Adjusted Depth to Water ^a	Water Level Elevation (ft AMSL)	Adjusted Freshwater Head (ft AMSL)
H-5bR	CUL	01/08/25	485.40	3,023.55	3,063.27
H-5bR	CUL	02/04/25	485.16	3,023.79	3,063.53
H-5bR	CUL	03/04/25	485.08	3,023.87	3,063.62
H-5bR	CUL	04/02/25	484.96	3,023.99	3,063.75
H-5bR	CUL	05/05/25	485.40	3,023.55	3,063.27
H-5bR	CUL	06/03/25	485.59	3,023.36	3,063.06
H-5bR	CUL	07/14/25	486.19	3,022.76	3,062.40
H-5bR	CUL	08/05/25	486.14	3,022.81	3,062.46
H-5bR	CUL	09/09/25	486.23	3,022.72	3,062.36
H-5bR	CUL	10/07/25	486.24	3,022.71	3,062.35
H-5bR	CUL	11/05/25	486.45	3,022.50	3,062.12
H-5bR	CUL	12/09/25	486.45	3,022.50	3,062.12
H-6bR	CUL	01/14/25	300.13	3,049.09	3,061.46
H-6bR	CUL	02/04/25	300.07	3,049.15	3,061.52
H-6bR	CUL	03/04/25	299.94	3,049.28	3,061.66
H-6bR	CUL	04/02/25	299.87	3,049.35	3,061.73
H-6bR	CUL	05/06/25	300.00	3,049.22	3,061.60
H-6bR	CUL	06/03/25	299.55	3,049.67	3,062.06
H-6bR	CUL	07/15/25	299.51	3,049.71	3,062.10
H-6bR	CUL	08/06/25	N/A	N/A	N/A
H-6bR	CUL	09/09/25	N/A	N/A	N/A
H-6bR	CUL	10/08/25	300.54	3,048.68	3,061.03
H-6bR	CUL	11/05/25	300.44	3,048.78	3,061.14
H-6bR	CUL	12/10/25	300.46	3,048.76	3,061.12
H-9bR	CUL	01/07/25	433.63	2,974.71	2,976.10
H-9bR	CUL	02/03/25	432.45	2,975.89	2,977.28
H-9bR	CUL	03/03/25	439.90	2,968.44	2,969.79
H-9bR	CUL	04/01/25	436.45	2,971.89	2,973.26
H-9bR	CUL	05/01/25	436.44	2,971.90	2,973.27
H-9bR	CUL	06/02/25	435.57	2,972.77	2,974.15
H-9bR	CUL	07/10/25	434.40	2,973.94	2,975.32
H-9bR	CUL	08/04/25	436.22	2,972.12	2,973.49
H-9bR	CUL	09/08/25	440.22	2,968.12	2,969.47
H-9bR	CUL	10/06/25	441.60	2,966.74	2,968.08
H-9bR	CUL	11/04/25	435.83	2,972.51	2,973.88
H-9bR	CUL	12/08/25	431.78	2,976.56	2,977.96
H-10cR	CUL	01/07/25	706.62	2,983.45	3,046.16
H-10cR	CUL	02/03/25	704.74	2,985.33	3,048.22
H-10cR	CUL	03/03/25	703.71	2,986.36	3,049.35
H-10cR	CUL	04/01/25	702.96	2,987.11	3,050.17

Well	Zone	Date	Adjusted Depth to Water ^a	Water Level Elevation (ft AMSL)	Adjusted Freshwater Head (ft AMSL)
H-10cR	CUL	05/01/25	701.92	2,988.15	3,051.30
H-10cR	CUL	06/02/25	701.46	2,988.61	3,051.81
H-10cR	CUL	07/14/25	702.27	2,987.80	3,050.92
H-10cR	CUL	08/04/25	701.88	2,988.19	3,051.35
H-10cR	CUL	09/08/25	701.16	2,988.91	3,052.14
H-10cR	CUL	10/06/25	700.59	2,989.48	3,052.76
H-10cR	CUL	11/04/25	699.78	2,990.29	3,053.65
H-10cR	CUL	12/08/25	699.96	2,990.11	3,053.45
H-11b4R	CUL	01/14/25	443.68	2,968.19	2,990.39
H-11b4R	CUL	02/03/25	443.13	2,968.74	2,990.99
H-11b4R	CUL	03/03/25	443.42	2,968.45	2,990.67
H-11b4R	CUL	04/03/25	443.17	2,968.70	2,990.94
H-11b4R	CUL	05/05/25	443.51	2,968.36	2,990.58
H-11b4R	CUL	06/02/25	443.86	2,968.01	2,990.20
H-11b4R	CUL	07/01/25	444.09	2,967.78	2,989.95
H-11b4R	CUL	08/04/25	443.03	2,968.84	2,991.09
H-11b4R	CUL	09/08/25	443.20	2,968.67	2,990.91
H-11b4R	CUL	10/06/25	443.12	2,968.75	2,991.00
H-11b4R	CUL	11/04/25	442.96	2,968.91	2,991.17
H-11b4R	CUL	12/08/25	441.91	2,969.96	2,992.30
H-12R	CUL	01/07/25	464.65	2,964.23	3,004.01
H-12R	CUL	02/03/25	464.78	2,964.10	3,003.87
H-12R	CUL	03/03/25	464.72	2,964.16	3,003.94
H-12R	CUL	04/02/25	464.31	2,964.57	3,004.39
H-12R	CUL	05/01/25	464.78	2,964.10	3,003.87
H-12R	CUL	06/02/25	465.22	2,963.66	3,003.39
H-12R	CUL	07/14/25	465.59	2,963.29	3,002.98
H-12R	CUL	08/04/25	465.30	2,963.58	3,003.30
H-12R	CUL	09/08/25	465.02	2,963.86	3,003.61
H-12R	CUL	10/06/25	464.50	2,964.38	3,004.18
H-12R	CUL	11/10/25	461.78	2,967.10	3,007.19
H-12R	CUL	12/08/25	459.52	2,969.36	3,009.69
H-15R	CUL	01/13/25	526.88	2,955.14	2,998.37
H-15R	CUL	02/04/25	525.91	2,956.11	2,999.46
H-15R	CUL	03/05/25	525.80	2,956.22	2,999.59
H-15R	CUL	04/03/25	525.63	2,956.39	2,999.78
H-15R	CUL	05/05/25	525.95	2,956.07	2,999.42
H-15R	CUL	06/04/25	525.43	2,956.59	3,000.00
H-15R	CUL	07/01/25	526.70	2,955.32	2,998.57
H-15R	CUL	08/06/25	526.44	2,955.58	2,998.87

Well	Zone	Date	Adjusted Depth to Water ^a	Water Level Elevation (ft AMSL)	Adjusted Freshwater Head (ft AMSL)
H-15R	CUL	09/10/25	526.08	2,955.94	2,999.27
H-15R	CUL	10/08/25	525.95	2,956.07	2,999.42
H-15R	CUL	11/05/25	525.85	2,956.17	2,999.53
H-15R	CUL	12/10/25	525.21	2,956.81	3,000.25
H-16	CUL	01/14/25	488.03	2,922.03	2,929.95
H-16	CUL	02/05/25	487.91	2,922.15	2,930.08
H-16	CUL	03/05/25	485.95	2,924.11	2,932.11
H-16	CUL	04/03/25	485.95	2,924.11	2,932.11
H-16	CUL	05/06/25	486.58	2,923.48	2,931.45
H-16	CUL	06/04/25	485.21	2,924.85	2,932.87
H-16	CUL	07/15/25	451.13	2,958.93	2,968.15
H-16	CUL	08/07/25	444.95	2,965.11	2,974.54
H-16	CUL	09/10/25	438.91	2,971.15	2,980.79
H-16	CUL	10/08/25	421.51	2,988.55	2,998.80
H-16	CUL	11/05/25	414.43	2,995.63	3,006.13
H-16	CUL	12/02/25	412.98	2,997.08	3,007.63
H-19b0	CUL	01/13/25	451.55	2,966.78	2,984.62
H-19b0	CUL	02/03/25	451.32	2,967.01	2,984.86
H-19b0	CUL	03/05/25	451.38	2,966.95	2,984.80
H-19b0	CUL	04/01/25	450.95	2,967.38	2,985.26
H-19b0	CUL	05/05/25	451.29	2,967.04	2,984.90
H-19b0	CUL	06/04/25	452.09	2,966.24	2,984.05
H-19b0	CUL	07/01/25	452.12	2,966.21	2,984.02
H-19b0	CUL	08/06/25	451.07	2,967.26	2,985.13
H-19b0	CUL	09/08/25	450.03	2,968.30	2,986.23
H-19b0	CUL	10/08/25	449.32	2,969.01	2,986.98
H-19b0	CUL	11/04/25	448.28	2,970.05	2,988.08
H-19b0	CUL	12/08/25	447.00	2,971.33	2,989.44
H-19b2	CUL	03/05/25	452.69	2,966.24	2,984.14
H-19b2	CUL	06/04/25	453.44	2,965.49	2,983.34
H-19b2	CUL	09/08/25	451.40	2,967.53	2,985.50
H-19b2	CUL	12/08/25	448.40	2,970.53	2,988.68
H-19b3	CUL	03/05/25	452.89	2,966.13	2,983.93
H-19b3	CUL	06/04/25	453.70	2,965.32	2,983.07
H-19b3	CUL	09/08/25	451.59	2,967.43	2,985.31
H-19b3	CUL	12/08/25	447.60	2,971.42	2,989.53
H-19b4	CUL	03/05/25	452.36	2,966.62	2,984.45
H-19b4	CUL	06/04/25	453.13	2,965.85	2,983.64
H-19b4	CUL	09/08/25	451.03	2,967.95	2,985.86
H-19b4	CUL	12/08/25	447.96	2,971.02	2,989.11

Well	Zone	Date	Adjusted Depth to Water ^a	Water Level Elevation (ft AMSL)	Adjusted Freshwater Head (ft AMSL)
H-19b5	CUL	03/05/25	452.12	2,966.46	2,984.28
H-19b5	CUL	06/04/25	452.91	2,965.67	2,983.44
H-19b5	CUL	09/08/25	450.89	2,967.69	2,985.58
H-19b5	CUL	12/08/25	447.81	2,970.77	2,988.85
H-19b6	CUL	03/05/25	452.81	2,966.21	2,984.02
H-19b6	CUL	06/04/25	453.65	2,965.37	2,983.13
H-19b6	CUL	09/08/25	451.57	2,967.45	2,985.33
H-19b6	CUL	12/08/25	448.48	2,970.54	2,988.60
H-19b7	CUL	03/05/25	452.58	2,966.36	2,984.18
H-19b7	CUL	06/04/25	453.41	2,965.53	2,983.30
H-19b7	CUL	09/08/25	451.35	2,967.59	2,985.48
H-19b7	CUL	12/08/25	448.32	2,970.62	2,988.69
I-461	CUL	01/14/25	251.96	3,031.92	3,033.42
I-461	CUL	02/04/25	251.98	3,031.90	3,033.40
I-461	CUL	03/04/25	252.01	3,031.87	3,033.37
I-461	CUL	04/02/25	251.97	3,031.91	3,033.41
I-461	CUL	05/06/25	251.83	3,032.05	3,033.55
I-461	CUL	06/03/25	250.93	3,032.95	3,034.46
I-461	CUL	07/15/25	250.40	3,033.48	3,035.00
I-461	CUL	08/06/25	250.38	3,033.50	3,035.02
I-461	CUL	09/09/25	250.51	3,033.37	3,034.89
I-461	CUL	10/08/25	250.77	3,033.11	3,034.62
I-461	CUL	11/05/25	250.47	3,033.41	3,034.93
I-461	CUL	12/10/25	250.57	3,033.31	3,034.83
SNL-1	CUL	01/08/25	444.84	3,068.00	3,071.86
SNL-1	CUL	02/04/25	444.47	3,068.37	3,072.24
SNL-1	CUL	03/04/25	444.27	3,068.57	3,072.45
SNL-1	CUL	04/02/25	444.37	3,068.47	3,072.34
SNL-1	CUL	05/05/25	444.60	3,068.24	3,072.11
SNL-1	CUL	06/03/25	444.50	3,068.34	3,072.21
SNL-1	CUL	07/14/25	444.27	3,068.57	3,072.45
SNL-1	CUL	08/05/25	444.09	3,068.75	3,072.63
SNL-1	CUL	09/09/25	443.80	3,069.04	3,072.93
SNL-1	CUL	10/07/25	443.73	3,069.11	3,073.00
SNL-1	CUL	11/05/25	443.73	3,069.11	3,073.00
SNL-1	CUL	12/09/25	443.75	3,069.09	3,072.98
SNL-2	CUL	01/08/25	261.52	3,061.54	3,064.26
SNL-2	CUL	02/04/25	261.33	3,061.73	3,064.45
SNL-2	CUL	03/04/25	261.22	3,061.84	3,064.56
SNL-2	CUL	04/02/25	261.28	3,061.78	3,064.50

Well	Zone	Date	Adjusted Depth to Water ^a	Water Level Elevation (ft AMSL)	Adjusted Freshwater Head (ft AMSL)
SNL-2	CUL	05/05/25	260.69	3,062.37	3,065.10
SNL-2	CUL	06/03/25	260.79	3,062.27	3,065.00
SNL-2	CUL	07/14/25	260.35	3,062.71	3,065.45
SNL-2	CUL	08/06/25	260.65	3,062.41	3,065.14
SNL-2	CUL	09/09/25	260.37	3,062.69	3,065.43
SNL-2	CUL	10/07/25	260.66	3,062.40	3,065.13
SNL-2	CUL	11/05/25	260.36	3,062.70	3,065.44
SNL-2	CUL	12/09/25	259.90	3,063.16	3,065.90
SNL-3	CUL	01/08/25	429.57	3,060.78	3,071.56
SNL-3	CUL	02/04/25	429.18	3,061.17	3,071.97
SNL-3	CUL	03/04/25	429.10	3,061.25	3,072.05
SNL-3	CUL	04/02/25	429.24	3,061.11	3,071.90
SNL-3	CUL	05/05/25	429.55	3,060.80	3,071.58
SNL-3	CUL	06/03/25	429.64	3,060.71	3,071.49
SNL-3	CUL	07/14/25	429.38	3,060.97	3,071.76
SNL-3	CUL	08/05/25	429.40	3,060.95	3,071.74
SNL-3	CUL	09/09/25	429.08	3,061.27	3,072.07
SNL-3	CUL	10/07/25	429.04	3,061.31	3,072.11
SNL-3	CUL	11/04/25	429.06	3,061.29	3,072.09
SNL-3	CUL	12/09/25	428.99	3,061.36	3,072.16
SNL-5	CUL	01/08/25	319.02	3,060.96	3,062.61
SNL-5	CUL	02/04/25	318.62	3,061.36	3,063.01
SNL-5	CUL	03/04/25	318.81	3,061.17	3,062.82
SNL-5	CUL	04/02/25	319.05	3,060.93	3,062.58
SNL-5	CUL	05/05/25	319.55	3,060.43	3,062.08
SNL-5	CUL	06/03/25	319.68	3,060.30	3,061.95
SNL-5	CUL	07/14/25	319.67	3,060.31	3,061.96
SNL-5	CUL	08/06/25	319.66	3,060.32	3,061.97
SNL-5	CUL	09/09/25	319.47	3,060.51	3,062.16
SNL-5	CUL	10/07/25	319.75	3,060.23	3,061.88
SNL-5	CUL	11/05/25	319.78	3,060.20	3,061.85
SNL-5	CUL	12/09/25	319.72	3,060.26	3,061.91
SNL-6	CUL	01/08/25	397.68	3,248.43	3,497.67
SNL-6	CUL	02/04/25	397.98	3,248.13	3,497.29
SNL-6	CUL	03/04/25	396.78	3,249.33	3,498.81
SNL-6	CUL	04/02/25	396.27	3,249.84	3,499.45
SNL-6	CUL	05/05/25	396.00	3,250.11	3,499.80
SNL-6	CUL	06/03/25	395.65	3,250.46	3,500.24
SNL-6	CUL	07/14/25	394.93	3,251.18	3,501.15
SNL-6	CUL	08/05/25	394.57	3,251.54	3,501.60

Well	Zone	Date	Adjusted Depth to Water ^a	Water Level Elevation (ft AMSL)	Adjusted Freshwater Head (ft AMSL)
SNL-6	CUL	09/09/25	394.08	3,252.03	3,502.22
SNL-6	CUL	10/07/25	393.67	3,252.44	3,502.74
SNL-6	CUL	11/05/25	393.28	3,252.83	3,503.24
SNL-6	CUL	12/09/25	393.57	3,252.54	3,502.87
SNL-8	CUL	01/08/25	540.11	3,015.62	3,056.86
SNL-8	CUL	02/04/25	539.50	3,016.23	3,057.53
SNL-8	CUL	03/04/25	539.21	3,016.52	3,057.85
SNL-8	CUL	04/02/25	539.48	3,016.25	3,057.55
SNL-8	CUL	05/05/25	540.05	3,015.68	3,056.93
SNL-8	CUL	06/03/25	540.05	3,015.68	3,056.93
SNL-8	CUL	07/14/25	540.83	3,014.90	3,056.07
SNL-8	CUL	08/05/25	540.62	3,015.11	3,056.30
SNL-8	CUL	09/09/25	540.39	3,015.34	3,056.56
SNL-8	CUL	10/07/25	544.40	3,011.33	3,052.16
SNL-8	CUL	11/05/25	542.26	3,013.47	3,054.51
SNL-8	CUL	12/09/25	541.82	3,013.91	3,054.99
SNL-9	CUL	01/14/25	320.17	3,040.79	3,045.48
SNL-9	CUL	02/04/25	319.97	3,040.99	3,045.69
SNL-9	CUL	03/04/25	319.96	3,041.00	3,045.70
SNL-9	CUL	04/02/25	319.88	3,041.08	3,045.78
SNL-9	CUL	05/06/25	319.65	3,041.31	3,046.01
SNL-9	CUL	06/03/25	319.38	3,041.58	3,046.29
SNL-9	CUL	07/15/25	319.00	3,041.96	3,046.68
SNL-9	CUL	08/06/25	319.27	3,041.69	3,046.40
SNL-9	CUL	09/09/25	319.14	3,041.82	3,046.53
SNL-9	CUL	10/08/25	319.24	3,041.72	3,046.43
SNL-9	CUL	11/05/25	319.19	3,041.77	3,046.48
SNL-9	CUL	12/10/25	319.18	3,041.78	3,046.49
SNL-10	CUL	01/14/25	341.45	3,036.14	3,039.40
SNL-10	CUL	02/04/25	341.23	3,036.36	3,039.63
SNL-10	CUL	03/04/25	341.15	3,036.44	3,039.71
SNL-10	CUL	04/02/25	341.08	3,036.51	3,039.78
SNL-10	CUL	05/06/25	341.20	3,036.39	3,039.66
SNL-10	CUL	06/03/25	342.06	3,035.53	3,038.79
SNL-10	CUL	07/15/25	340.55	3,037.04	3,040.32
SNL-10	CUL	08/06/25	340.33	3,037.26	3,040.54
SNL-10	CUL	09/09/25	339.67	3,037.92	3,041.21
SNL-10	CUL	10/08/25	339.34	3,038.25	3,041.54
SNL-10	CUL	11/05/25	339.05	3,038.54	3,041.83
SNL-10	CUL	12/10/25	338.74	3,038.85	3,042.15

Well	Zone	Date	Adjusted Depth to Water ^a	Water Level Elevation (ft AMSL)	Adjusted Freshwater Head (ft AMSL)
SNL-12	CUL	01/07/25	352.08	2,987.38	2,989.35
SNL-12	CUL	02/03/25	351.15	2,988.31	2,990.29
SNL-12	CUL	03/03/25	351.05	2,988.41	2,990.39
SNL-12	CUL	04/01/25	351.63	2,987.83	2,989.80
SNL-12	CUL	05/06/25	352.25	2,987.21	2,989.18
SNL-12	CUL	06/02/25	352.10	2,987.36	2,989.33
SNL-12	CUL	07/09/25	352.20	2,987.26	2,989.23
SNL-12	CUL	08/04/25	351.26	2,988.20	2,990.18
SNL-12	CUL	09/08/25	352.36	2,987.10	2,989.07
SNL-12	CUL	10/06/25	352.87	2,986.59	2,988.55
SNL-12	CUL	11/04/25	352.39	2,987.07	2,989.04
SNL-12	CUL	12/08/25	350.91	2,988.55	2,990.53
SNL-13	CUL	01/07/25	298.73	2,995.38	2,998.14
SNL-13	CUL	02/03/25	298.77	2,995.34	2,998.10
SNL-13	CUL	03/03/25	298.03	2,996.08	2,998.86
SNL-13	CUL	04/01/25	297.16	2,996.95	2,999.75
SNL-13	CUL	05/01/25	296.50	2,997.61	3,000.43
SNL-13	CUL	06/02/25	295.89	2,998.22	3,001.06
SNL-13	CUL	07/09/25	295.22	2,998.89	3,001.75
SNL-13	CUL	08/04/25	294.66	2,999.45	3,002.32
SNL-13	CUL	09/08/25	292.42	3,001.69	3,004.62
SNL-13	CUL	10/06/25	294.00	3,000.11	3,003.00
SNL-13	CUL	11/04/25	294.15	2,999.96	3,002.85
SNL-13	CUL	12/08/25	294.11	3,000.00	3,002.89
SNL-14	CUL	01/14/25	391.32	2,977.09	2,991.28
SNL-14	CUL	02/03/25	390.63	2,977.78	2,992.00
SNL-14	CUL	03/03/25	390.45	2,977.96	2,992.19
SNL-14	CUL	04/03/25	390.92	2,977.49	2,991.70
SNL-14	CUL	05/05/25	391.33	2,977.08	2,991.27
SNL-14	CUL	06/02/25	391.54	2,976.87	2,991.05
SNL-14	CUL	07/01/25	391.68	2,976.73	2,990.90
SNL-14	CUL	08/04/25	390.53	2,977.88	2,992.11
SNL-14	CUL	09/08/25	391.27	2,977.14	2,991.33
SNL-14	CUL	10/06/25	391.30	2,977.11	2,991.30
SNL-14	CUL	11/04/25	391.09	2,977.32	2,991.52
SNL-14	CUL	12/08/25	389.98	2,978.43	2,992.69
SNL-15	CUL	01/07/25	461.35	3,018.58	3,126.57
SNL-15	CUL	02/03/25	460.83	3,019.10	3,127.21
SNL-15	CUL	03/03/25	460.41	3,019.52	3,127.73
SNL-15	CUL	04/02/25	459.95	3,019.98	3,128.29

Well	Zone	Date	Adjusted Depth to Water ^a	Water Level Elevation (ft AMSL)	Adjusted Freshwater Head (ft AMSL)
SNL-15	CUL	05/01/25	460.49	3,019.44	3,127.63
SNL-15	CUL	06/02/25	459.15	3,020.78	3,129.28
SNL-15	CUL	07/14/25	458.58	3,021.35	3,129.98
SNL-15	CUL	08/04/25	458.18	3,021.75	3,130.48
SNL-15	CUL	09/08/25	458.35	3,021.58	3,130.27
SNL-15	CUL	10/06/25	458.88	3,021.05	3,129.61
SNL-15	CUL	11/04/25	457.51	3,022.42	3,131.30
SNL-15	CUL	12/08/25	457.15	3,022.78	3,131.75
SNL-16	CUL	01/07/25	129.30	3,003.70	3,004.16
SNL-16	CUL	02/03/25	129.14	3,003.86	3,004.32
SNL-16	CUL	03/03/25	128.96	3,004.04	3,004.50
SNL-16	CUL	04/01/25	129.10	3,003.90	3,004.36
SNL-16	CUL	05/01/25	129.05	3,003.95	3,004.41
SNL-16	CUL	06/02/25	128.06	3,004.94	3,005.41
SNL-16	CUL	07/09/25	127.96	3,005.04	3,005.51
SNL-16	CUL	08/04/25	127.50	3,005.50	3,005.97
SNL-16	CUL	09/08/25	127.85	3,005.15	3,005.62
SNL-16	CUL	10/06/25	127.85	3,005.15	3,005.62
SNL-16	CUL	11/04/25	127.99	3,005.01	3,005.48
SNL-16	CUL	12/08/25	128.15	3,004.85	3,005.32
SNL-17	CUL	01/07/25	237.85	3,000.21	3,000.55
SNL-17	CUL	02/03/25	237.53	3,000.53	3,000.87
SNL-17	CUL	03/03/25	237.27	3,000.79	3,001.13
SNL-17	CUL	04/01/25	237.34	3,000.72	3,001.06
SNL-17	CUL	05/01/25	237.54	3,000.52	3,000.86
SNL-17	CUL	06/02/25	236.15	3,001.91	3,002.25
SNL-17	CUL	07/09/25	235.30	3,002.76	3,003.10
SNL-17	CUL	08/04/25	234.81	3,003.25	3,003.59
SNL-17	CUL	09/08/25	235.44	3,002.62	3,002.96
SNL-17	CUL	10/06/25	235.74	3,002.32	3,002.66
SNL-17	CUL	11/04/25	236.13	3,001.93	3,002.27
SNL-17	CUL	12/08/25	236.08	3,001.98	3,002.32
SNL-18	CUL	01/08/25	311.88	3,063.56	3,064.04
SNL-18	CUL	02/04/25	311.57	3,063.87	3,064.35
SNL-18	CUL	03/04/25	311.79	3,063.65	3,064.13
SNL-18	CUL	04/02/25	312.29	3,063.15	3,063.63
SNL-18	CUL	05/05/25	312.85	3,062.59	3,063.07
SNL-18	CUL	06/03/25	313.01	3,062.43	3,062.91
SNL-18	CUL	07/14/25	313.20	3,062.24	3,062.72
SNL-18	CUL	08/05/25	313.25	3,062.19	3,062.67

Well	Zone	Date	Adjusted Depth to Water ^a	Water Level Elevation (ft AMSL)	Adjusted Freshwater Head (ft AMSL)
SNL-18	CUL	09/09/25	313.30	3,062.14	3,062.62
SNL-18	CUL	10/07/25	313.68	3,061.76	3,062.24
SNL-18	CUL	11/05/25	313.77	3,061.67	3,062.14
SNL-18	CUL	12/09/25	313.82	3,061.62	3,062.09
SNL-19	CUL	01/08/25	160.40	3,062.25	3,063.42
SNL-19	CUL	02/04/25	160.27	3,062.38	3,063.55
SNL-19	CUL	03/04/25	160.30	3,062.35	3,063.52
SNL-19	CUL	04/02/25	160.28	3,062.37	3,063.54
SNL-19	CUL	05/05/25	159.90	3,062.75	3,062.38
SNL-19	CUL	06/03/25	159.83	3,062.82	3,063.99
SNL-19	CUL	07/14/25	159.42	3,063.23	3,064.40
SNL-19	CUL	08/06/25	159.22	3,063.43	3,064.60
SNL-19	CUL	09/09/25	159.41	3,063.24	3,064.41
SNL-19	CUL	10/07/25	159.75	3,062.90	3,064.07
SNL-19	CUL	11/05/25	159.52	3,063.13	3,064.30
SNL-19	CUL	12/09/25	159.12	3,063.53	3,064.71
WIPP-11R	CUL	01/08/25	373.33	3,053.93	3,067.48
WIPP-11R	CUL	02/04/25	373.05	3,054.21	3,067.77
WIPP-11R	CUL	03/04/25	373.01	3,054.25	3,067.81
WIPP-11R	CUL	04/02/25	373.06	3,054.20	3,067.76
WIPP-11R	CUL	05/05/25	373.30	3,053.96	3,067.51
WIPP-11R	CUL	06/03/25	373.45	3,053.81	3,067.36
WIPP-11R	CUL	07/15/25	373.30	3,053.96	3,067.51
WIPP-11R	CUL	08/06/25	373.14	3,054.12	3,067.68
WIPP-11R	CUL	09/09/25	372.80	3,054.46	3,068.02
WIPP-11R	CUL	10/07/25	372.83	3,054.43	3,067.99
WIPP-11R	CUL	11/05/25	372.85	3,054.41	3,067.97
WIPP-11R	CUL	12/09/25	372.67	3,054.59	3,068.16
WQSP-1	CUL	01/08/25	371.28	3,047.97	3,064.75
WQSP-1	CUL	02/04/25	370.88	3,048.37	3,065.17
WQSP-1	CUL	03/04/25	370.77	3,048.48	3,065.28
WQSP-1	CUL	04/02/25	370.80	3,048.45	3,065.25
WQSP-1	CUL	05/06/25	371.12	3,048.13	3,064.91
WQSP-1	CUL	06/03/25	371.17	3,048.08	3,064.86
WQSP-1	CUL	07/15/25	370.43	3,048.82	3,065.64
WQSP-1	CUL	08/06/25	370.60	3,048.65	3,065.46
WQSP-1	CUL	09/09/25	369.95	3,049.30	3,066.14
WQSP-1	CUL	10/07/25	369.94	3,049.31	3,066.15
WQSP-1	CUL	11/05/25	369.84	3,049.41	3,066.26
WQSP-1	CUL	12/10/25	369.87	3,049.38	3,066.23

Well	Zone	Date	Adjusted Depth to Water ^a	Water Level Elevation (ft AMSL)	Adjusted Freshwater Head (ft AMSL)
WQSP-2	CUL	01/08/25	412.49	3,051.38	3,072.01
WQSP-2	CUL	02/04/25	412.05	3,051.82	3,072.47
WQSP-2	CUL	03/04/25	411.76	3,052.11	3,072.78
WQSP-2	CUL	04/02/25	412.00	3,051.87	3,072.52
WQSP-2	CUL	05/05/25	412.33	3,051.54	3,072.18
WQSP-2	CUL	06/03/25	412.67	3,051.20	3,071.82
WQSP-2	CUL	07/14/25	412.06	3,051.81	3,072.46
WQSP-2	CUL	08/05/25	411.89	3,051.98	3,072.64
WQSP-2	CUL	09/09/25	411.57	3,052.30	3,072.98
WQSP-2	CUL	10/07/25	411.54	3,052.33	3,073.01
WQSP-2	CUL	11/05/25	411.56	3,052.31	3,072.99
WQSP-2	CUL	12/09/25	411.54	3,052.33	3,073.01
WQSP-3	CUL	01/08/25	478.69	3,001.45	3,057.86
WQSP-3	CUL	02/04/25	478.29	3,001.85	3,058.32
WQSP-3	CUL	03/04/25	478.06	3,002.08	3,058.58
WQSP-3	CUL	04/02/25	477.94	3,002.20	3,058.72
WQSP-3	CUL	05/05/25	478.94	3,001.20	3,057.57
WQSP-3	CUL	06/03/25	478.91	3,001.23	3,057.61
WQSP-3	CUL	07/14/25	479.07	3,001.07	3,057.42
WQSP-3	CUL	08/05/25	478.81	3,001.33	3,057.72
WQSP-3	CUL	09/09/25	478.58	3,001.56	3,057.99
WQSP-3	CUL	10/07/25	478.16	3,001.98	3,058.47
WQSP-3	CUL	11/05/25	478.14	3,002.00	3,058.49
WQSP-3	CUL	12/09/25	477.71	3,002.43	3,058.99
WQSP-4	CUL	01/13/25	468.55	2,964.54	2,988.90
WQSP-4	CUL	02/03/25	468.27	2,964.82	2,989.20
WQSP-4	CUL	03/05/25	468.27	2,964.82	2,989.20
WQSP-4	CUL	04/01/25	467.93	2,965.16	2,989.57
WQSP-4	CUL	05/05/25	468.39	2,964.70	2,989.08
WQSP-4	CUL	06/04/25	469.03	2,964.06	2,988.39
WQSP-4	CUL	07/01/25	469.02	2,964.07	2,988.40
WQSP-4	CUL	08/06/25	468.07	2,965.02	2,989.42
WQSP-4	CUL	09/08/25	467.13	2,965.96	2,990.43
WQSP-4	CUL	10/08/25	466.28	2,966.81	2,991.35
WQSP-4	CUL	11/10/25	465.35	2,967.74	2,992.35
WQSP-4	CUL	12/08/25	464.04	2,969.05	2,993.76
WQSP-5	CUL	01/13/25	406.60	2,977.78	2,985.09
WQSP-5	CUL	02/03/25	406.88	2,977.50	2,984.80
WQSP-5	CUL	03/05/25	406.77	2,977.61	2,984.92
WQSP-5	CUL	04/01/25	406.38	2,978.00	2,985.32

Well	Zone	Date	Adjusted Depth to Water ^a	Water Level Elevation (ft AMSL)	Adjusted Freshwater Head (ft AMSL)
WQSP-5	CUL	05/05/25	406.53	2,977.85	2,985.16
WQSP-5	CUL	06/04/25	407.32	2,977.06	2,984.35
WQSP-5	CUL	07/01/25	407.35	2,977.03	2,984.32
WQSP-5	CUL	08/07/25	406.30	2,978.08	2,985.40
WQSP-5	CUL	09/08/25	405.49	2,978.89	2,986.23
WQSP-5	CUL	10/08/25	404.57	2,979.81	2,987.18
WQSP-5	CUL	11/04/25	403.67	2,980.71	2,988.11
WQSP-5	CUL	12/08/25	402.38	2,982.00	2,989.43
WQSP-6	CUL	01/13/25	374.78	2,989.94	2,994.39
WQSP-6	CUL	02/03/25	375.63	2,989.09	2,993.52
WQSP-6	CUL	03/05/25	375.78	2,988.94	2,993.37
WQSP-6	CUL	04/01/25	375.36	2,989.36	2,993.80
WQSP-6	CUL	05/05/25	375.86	2,988.86	2,993.29
WQSP-6	CUL	06/04/25	376.00	2,988.72	2,993.14
WQSP-6	CUL	07/01/25	375.88	2,988.84	2,993.26
WQSP-6	CUL	08/07/25	374.83	2,989.89	2,994.34
WQSP-6	CUL	09/08/25	373.63	2,991.09	2,995.56
WQSP-6	CUL	10/08/25	372.36	2,992.36	2,996.86
WQSP-6	CUL	11/04/25	371.04	2,993.68	2,998.20
WQSP-6	CUL	12/02/25	369.86	2,994.86	2,999.41
C-2737 (ANNULUS)	MAG	01/14/25	274.20	3,126.56	N/A
C-2737 (ANNULUS)	MAG	02/04/25	274.40	3,126.36	N/A
C-2737 (ANNULUS)	MAG	03/05/25	274.96	3,125.80	N/A
C-2737 (ANNULUS)	MAG	04/01/25	275.39	3,125.37	N/A
C-2737 (ANNULUS)	MAG	05/06/25	276.30	3,124.46	N/A
C-2737 (ANNULUS)	MAG	06/04/25	276.98	3,123.78	N/A
C-2737 (ANNULUS)	MAG	07/01/25	277.70	3,123.06	N/A
C-2737 (ANNULUS)	MAG	08/06/25	278.42	3,122.34	N/A
C-2737 (ANNULUS)	MAG	09/10/25	278.85	3,121.91	N/A
C-2737 (ANNULUS)	MAG	10/08/25	279.38	3,121.38	N/A
C-2737 (ANNULUS)	MAG	11/05/25	279.73	3,121.03	N/A
C-2737 (ANNULUS)	MAG	12/02/25	280.18	3,120.58	N/A
H-2b1	MAG	01/07/25	249.00	3,129.49	N/A

Well	Zone	Date	Adjusted Depth to Water ^a	Water Level Elevation (ft AMSL)	Adjusted Freshwater Head (ft AMSL)
H-2b1	MAG	02/03/25	249.90	3,128.59	N/A
H-2b1	MAG	03/03/25	250.97	3,127.52	N/A
H-2b1	MAG	04/01/25	251.84	3,126.65	N/A
H-2b1	MAG	05/01/25	252.80	3,125.69	N/A
H-2b1	MAG	06/02/25	253.70	3,124.79	N/A
H-2b1	MAG	07/01/25	255.01	3,123.48	N/A
H-2b1	MAG	08/04/25	255.87	3,122.62	N/A
H-2b1	MAG	09/08/25	256.98	3,121.51	N/A
H-2b1	MAG	10/06/25	257.98	3,120.51	N/A
H-2b1	MAG	11/04/25	258.76	3,119.73	N/A
H-2b1	MAG	12/08/25	259.89	3,118.60	N/A
H-3b1	MAG	01/13/25	250.28	3,140.44	N/A
H-3b1	MAG	02/04/25	250.56	3,140.16	N/A
H-3b1	MAG	03/05/25	251.00	3,139.72	N/A
H-3b1	MAG	04/01/25	251.35	3,139.37	N/A
H-3b1	MAG	05/05/25	251.98	3,138.74	N/A
H-3b1	MAG	06/04/25	252.65	3,138.07	N/A
H-3b1	MAG	07/01/25	253.29	3,137.43	N/A
H-3b1	MAG	08/06/25	253.85	3,136.87	N/A
H-3b1	MAG	09/10/25	254.18	3,136.54	N/A
H-3b1	MAG	10/06/25	254.36	3,136.36	N/A
H-3b1	MAG	11/04/25	254.90	3,135.82	N/A
H-3b1	MAG	12/08/25	255.13	3,135.59	N/A
H-4c	MAG	01/07/25	194.00	3,140.28	N/A
H-4c	MAG	02/05/25	194.69	3,139.59	N/A
H-4c	MAG	03/03/25	194.97	3,139.31	N/A
H-4c	MAG	04/01/25	194.70	3,139.58	N/A
H-4c	MAG	05/01/25	194.01	3,140.27	N/A
H-4c	MAG	06/02/25	193.52	3,140.76	N/A
H-4c	MAG	07/10/25	193.20	3,141.08	N/A
H-4c	MAG	08/04/25	192.49	3,141.79	N/A
H-4c	MAG	09/08/25	191.82	3,142.46	N/A
H-4c	MAG	10/06/25	191.10	3,143.18	N/A
H-4c	MAG	11/04/25	190.14	3,144.14	N/A
H-4c	MAG	12/08/25	189.29	3,144.99	N/A
H-6c	MAG	01/14/25	291.58	3,057.11	N/A
H-6c	MAG	02/04/25	291.49	3,057.20	N/A
H-6c	MAG	03/04/25	291.73	3,056.96	N/A
H-6c	MAG	04/02/25	292.00	3,056.69	N/A
H-6c	MAG	05/06/25	292.50	3,056.19	N/A

Well	Zone	Date	Adjusted Depth to Water ^a	Water Level Elevation (ft AMSL)	Adjusted Freshwater Head (ft AMSL)
H-6c	MAG	06/03/25	292.34	3,056.35	N/A
H-6c	MAG	07/15/25	292.96	3,055.73	N/A
H-6c	MAG	08/06/25	293.32	3,055.37	N/A
H-6c	MAG	09/09/25	293.40	3,055.29	N/A
H-6c	MAG	10/08/25	293.81	3,054.88	N/A
H-6c	MAG	11/05/25	294.13	3,054.56	N/A
H-6c	MAG	12/10/25	294.39	3,054.30	N/A
H-8a	MAG	01/07/25	403.62	3,029.66	N/A
H-8a	MAG	02/03/25	403.46	3,029.82	N/A
H-8a	MAG	03/03/25	402.83	3,030.45	N/A
H-8a	MAG	04/01/25	402.60	3,030.68	N/A
H-8a	MAG	05/01/25	402.20	3,031.08	N/A
H-8a	MAG	06/02/25	401.88	3,031.40	N/A
H-8a	MAG	07/10/25	401.65	3,031.63	N/A
H-8a	MAG	08/04/25	401.91	3,031.37	N/A
H-8a	MAG	09/08/25	401.72	3,031.56	N/A
H-8a	MAG	10/06/25	402.12	3,031.16	N/A
H-8a	MAG	11/04/25	402.58	3,030.70	N/A
H-8a	MAG	12/08/25	402.19	3,031.09	N/A
H-9c	MAG	01/07/25	259.00	3,148.05	N/A
H-9c	MAG	02/03/25	258.64	3,148.41	N/A
H-9c	MAG	03/03/25	258.48	3,148.57	N/A
H-9c	MAG	04/01/25	258.55	3,148.50	N/A
H-9c	MAG	05/01/25	258.75	3,148.30	N/A
H-9c	MAG	06/02/25	258.69	3,148.36	N/A
H-9c	MAG	07/10/25	258.69	3,148.36	N/A
H-9c	MAG	08/04/25	258.79	3,148.26	N/A
H-9c	MAG	09/08/25	258.85	3,148.20	N/A
H-9c	MAG	10/06/25	258.68	3,148.37	N/A
H-9c	MAG	11/04/25	258.99	3,148.06	N/A
H-9c	MAG	12/08/25	259.11	3,147.94	N/A
H-10a	MAG	01/07/25	575.81	3,112.64	N/A
H-10a	MAG	02/03/25	574.65	3,113.80	N/A
H-10a	MAG	03/03/25	573.85	3,114.60	N/A
H-10a	MAG	04/01/25	573.20	3,115.25	N/A
H-10a	MAG	05/01/25	572.32	3,116.13	N/A
H-10a	MAG	06/02/25	571.50	3,116.95	N/A
H-10a	MAG	07/14/25	572.30	3,116.15	N/A
H-10a	MAG	08/04/25	572.17	3,116.28	N/A
H-10a	MAG	09/08/25	571.74	3,116.71	N/A

Well	Zone	Date	Adjusted Depth to Water ^a	Water Level Elevation (ft AMSL)	Adjusted Freshwater Head (ft AMSL)
H-10a	MAG	10/06/25	571.33	3,117.12	N/A
H-10a	MAG	11/04/25	571.02	3,117.43	N/A
H-10a	MAG	12/08/25	571.17	3,117.28	N/A
H-11b2	MAG	01/14/25	269.04	3,142.82	N/A
H-11b2	MAG	02/03/25	269.18	3,142.68	N/A
H-11b2	MAG	03/03/25	269.44	3,142.42	N/A
H-11b2	MAG	04/03/25	269.75	3,142.11	N/A
H-11b2	MAG	05/05/25	269.90	3,141.96	N/A
H-11b2	MAG	06/02/25	270.22	3,141.64	N/A
H-11b2	MAG	07/01/25	270.72	3,141.14	N/A
H-11b2	MAG	08/04/25	271.01	3,140.85	N/A
H-11b2	MAG	09/08/25	271.30	3,140.56	N/A
H-11b2	MAG	10/06/25	271.47	3,140.39	N/A
H-11b2	MAG	11/04/25	271.55	3,140.31	N/A
H-11b2	MAG	12/08/25	271.51	3,140.35	N/A
H-14	MAG	01/07/25	209.31	3,137.77	N/A
H-14	MAG	02/03/25	209.65	3,137.43	N/A
H-14	MAG	03/04/25	209.99	3,137.09	N/A
H-14	MAG	04/01/25	210.34	3,136.74	N/A
H-14	MAG	05/01/25	210.65	3,136.43	N/A
H-14	MAG	06/02/25	210.98	3,136.10	N/A
H-14	MAG	07/09/25	211.29	3,135.79	N/A
H-14	MAG	08/04/25	211.35	3,135.73	N/A
H-14	MAG	09/08/25	211.63	3,135.45	N/A
H-14	MAG	10/06/25	211.80	3,135.28	N/A
H-14	MAG	11/04/25	211.98	3,135.10	N/A
H-14	MAG	12/08/25	212.10	3,134.98	N/A
H-15	MAG	01/13/25	330.80	3,152.98	N/A
H-15	MAG	02/04/25	330.89	3,152.89	N/A
H-15	MAG	03/05/25	331.15	3,152.63	N/A
H-15	MAG	04/03/25	330.96	3,152.82	N/A
H-15	MAG	05/05/25	331.50	3,152.28	N/A
H-15	MAG	06/04/25	332.15	3,151.63	N/A
H-15	MAG	07/01/25	332.65	3,151.13	N/A
H-15	MAG	08/06/25	333.01	3,150.77	N/A
H-15	MAG	09/10/25	333.21	3,150.57	N/A
H-15	MAG	10/08/25	333.76	3,150.02	N/A
H-15	MAG	11/04/25	333.78	3,150.00	N/A
H-15	MAG	12/10/25	334.35	3,149.43	N/A
H-18	MAG	01/08/25	265.80	3,148.41	N/A

Well	Zone	Date	Adjusted Depth to Water ^a	Water Level Elevation (ft AMSL)	Adjusted Freshwater Head (ft AMSL)
H-18	MAG	02/04/25	265.98	3,148.23	N/A
H-18	MAG	03/04/25	266.24	3,147.97	N/A
H-18	MAG	04/02/25	266.70	3,147.51	N/A
H-18	MAG	05/06/25	267.40	3,146.81	N/A
H-18	MAG	06/03/25	268.04	3,146.17	N/A
H-18	MAG	07/15/25	268.72	3,145.49	N/A
H-18	MAG	08/06/25	269.31	3,144.90	N/A
H-18	MAG	09/09/25	269.76	3,144.45	N/A
H-18	MAG	10/07/25	270.37	3,143.84	N/A
H-18	MAG	11/05/25	270.99	3,143.22	N/A
H-18	MAG	12/10/25	271.68	3,142.53	N/A
WIPP-18	MAG	01/08/25	307.04	3,150.53	N/A
WIPP-18	MAG	02/04/25	307.18	3,150.39	N/A
WIPP-18	MAG	03/04/25	307.46	3,150.11	N/A
WIPP-18	MAG	04/02/25	307.73	3,149.84	N/A
WIPP-18	MAG	05/05/25	308.34	3,149.23	N/A
WIPP-18	MAG	06/03/25	308.73	3,148.84	N/A
WIPP-18	MAG	07/14/25	309.34	3,148.23	N/A
WIPP-18	MAG	08/05/25	309.77	3,147.80	N/A
WIPP-18	MAG	09/09/25	310.20	3,147.37	N/A
WIPP-18	MAG	10/07/25	310.61	3,146.96	N/A
WIPP-18	MAG	11/05/25	311.17	3,146.40	N/A
WIPP-18	MAG	12/09/25	311.58	3,145.99	N/A
WQSP-6a	DL	01/13/25	168.93	3,194.87	N/A
WQSP-6a	DL	02/03/25	168.73	3,195.07	N/A
WQSP-6a	DL	03/05/25	168.94	3,194.86	N/A
WQSP-6a	DL	04/01/25	168.79	3,195.01	N/A
WQSP-6a	DL	05/05/25	168.63	3,195.17	N/A
WQSP-6a	DL	06/04/25	168.90	3,194.90	N/A
WQSP-6a	DL	07/01/25	168.95	3,194.85	N/A
WQSP-6a	DL	08/07/25	168.90	3,194.90	N/A
WQSP-6a	DL	09/08/25	168.85	3,194.95	N/A
WQSP-6a	DL	10/08/25	169.04	3,194.76	N/A
WQSP-6a	DL	11/04/25	168.88	3,194.92	N/A
WQSP-6a	DL	12/02/25	168.72	3,195.08	N/A
CB-1	B/C	01/14/25	260.36	3,068.76	N/A
CB-1	B/C	02/03/25	260.22	3,068.90	N/A
CB-1	B/C	03/03/25	260.21	3,068.91	N/A
CB-1	B/C	04/03/25	259.83	3,069.29	N/A
CB-1	B/C	05/05/25	259.28	3,069.84	N/A

Well	Zone	Date	Adjusted Depth to Water ^a	Water Level Elevation (ft AMSL)	Adjusted Freshwater Head (ft AMSL)
CB-1	B/C	06/02/25	258.86	3,070.26	N/A
CB-1	B/C	07/01/25	258.05	3,071.07	N/A
CB-1	B/C	08/04/25	257.32	3,071.80	N/A
CB-1	B/C	09/08/25	258.28	3,070.84	N/A
CB-1	B/C	10/06/25	255.77	3,073.35	N/A
CB-1	B/C	11/04/25	254.97	3,074.15	N/A
CB-1	B/C	12/08/25	254.18	3,074.94	N/A
DOE-2	B/C	01/08/25	347.40	3,071.78	N/A
DOE-2	B/C	02/04/25	347.19	3,071.99	N/A
DOE-2	B/C	03/04/25	347.12	3,072.06	N/A
DOE-2	B/C	04/02/25	347.01	3,072.17	N/A
DOE-2	B/C	05/05/25	347.28	3,071.90	N/A
DOE-2	B/C	06/03/25	347.35	3,071.83	N/A
DOE-2	B/C	07/15/25	347.27	3,071.91	N/A
DOE-2	B/C	08/06/25	347.38	3,071.80	N/A
DOE-2	B/C	09/09/25	347.43	3,071.75	N/A
DOE-2	B/C	10/07/25	347.42	3,071.76	N/A
DOE-2	B/C	11/05/25	347.67	3,071.51	N/A
DOE-2	B/C	12/09/25	347.70	3,071.48	N/A
C-2505	SR/DL	03/05/25	N/A#	N/A#	N/A
C-2505	SR/DL	06/04/25	42.96	3,367.81	N/A
C-2505	SR/DL	09/10/25	43.82	3,366.95	N/A
C-2505	SR/DL	12/02/25	43.53	3,367.24	N/A
C-2506	SR/DL	03/05/25	N/A#	N/A#	N/A
C-2506	SR/DL	06/04/25	42.24	3,368.29	N/A
C-2506	SR/DL	09/10/25	43.10	3,367.43	N/A
C-2506	SR/DL	12/02/25	42.74	3,367.79	N/A
C-2507	SR/DL	03/05/25	45.57	3,364.34	N/A
C-2507	SR/DL	06/04/25	45.65	3,364.26	N/A
C-2507	SR/DL	09/10/25	45.50	3,364.41	N/A
C-2507	SR/DL	12/02/25	45.24	3,364.67	N/A
C-2811	SR/DL	03/05/25	54.71	3,344.13	N/A
C-2811	SR/DL	06/04/25	54.77	3,344.07	N/A
C-2811	SR/DL	09/10/25	55.07	3,343.77	N/A
C-2811	SR/DL	12/02/25	54.79	3,344.05	N/A
PZ-1	SR/DL	03/05/25	43.34	3,369.94	N/A
PZ-1	SR/DL	06/04/25	43.77	3,369.51	N/A
PZ-1	SR/DL	09/10/25	43.74	3,369.54	N/A
PZ-1	SR/DL	12/02/25	43.57	3,369.71	N/A
PZ-2	SR/DL	03/05/25	43.64	3,369.72	N/A

Well	Zone	Date	Adjusted Depth to Water ^a	Water Level Elevation (ft AMSL)	Adjusted Freshwater Head (ft AMSL)
PZ-2	SR/DL	06/04/25	43.65	3,369.71	N/A
PZ-2	SR/DL	09/10/25	43.93	3,369.43	N/A
PZ-2	SR/DL	12/02/25	43.76	3,369.60	N/A
PZ-3	SR/DL	03/05/25	45.95	3,370.17	N/A
PZ-3	SR/DL	06/04/25	46.35	3,369.77	N/A
PZ-3	SR/DL	09/10/25	46.65	3,369.47	N/A
PZ-3	SR/DL	12/02/25	46.81	3,369.31	N/A
PZ-4	SR/DL	03/05/25	47.01	3,365.00	N/A
PZ-4	SR/DL	06/04/25	47.10	3,364.91	N/A
PZ-4	SR/DL	09/10/25	47.23	3,364.78	N/A
PZ-4	SR/DL	12/02/25	46.88	3,365.13	N/A
PZ-5	SR/DL	03/05/25	43.90	3,371.34	N/A
PZ-5	SR/DL	06/04/25	44.24	3,371.00	N/A
PZ-5	SR/DL	09/10/25	44.91	3,370.33	N/A
PZ-5	SR/DL	12/02/25	45.02	3,370.22	N/A
PZ-6	SR/DL	03/05/25	44.75	3,368.58	N/A
PZ-6	SR/DL	06/04/25	45.00	3,368.33	N/A
PZ-6	SR/DL	09/10/25	45.31	3,368.02	N/A
PZ-6	SR/DL	12/02/25	45.04	3,368.29	N/A
PZ-7	SR/DL	03/05/25	39.74	3,374.10	N/A
PZ-7	SR/DL	06/04/25	40.00	3,373.84	N/A
PZ-7	SR/DL	09/10/25	40.20	3,373.64	N/A
PZ-7	SR/DL	12/02/25	40.27	3,373.57	N/A
PZ-9	SR/DL	03/05/25	58.19	3,362.90	N/A
PZ-9	SR/DL	06/04/25	58.30	3,362.79	N/A
PZ-9	SR/DL	09/10/25	58.31	3,362.78	N/A
PZ-9	SR/DL	12/02/25	58.12	3,362.97	N/A
PZ-10	SR/DL	03/05/25	39.61	3,366.12	N/A
PZ-10	SR/DL	06/04/25	39.85	3,365.88	N/A
PZ-10	SR/DL	09/10/25	39.28	3,366.45	N/A
PZ-10	SR/DL	12/02/25	38.68	3,367.05	N/A
PZ-11	SR/DL	03/05/25	48.04	3,370.74	N/A
PZ-11	SR/DL	06/04/25	48.15	3,370.63	N/A
PZ-11	SR/DL	09/10/25	48.28	3,370.50	N/A
PZ-11	SR/DL	12/02/25	48.22	3,370.56	N/A
PZ-12	SR/DL	03/05/25	54.29	3,354.63	N/A
PZ-12	SR/DL	06/04/25	54.63	3,354.29	N/A
PZ-12	SR/DL	09/10/25	54.59	3,354.33	N/A
PZ-12	SR/DL	12/02/25	54.12	3,354.80	N/A
PZ-13	SR/DL	03/05/25	65.89	3,356.35	N/A

Well	Zone	Date	Adjusted Depth to Water ^a	Water Level Elevation (ft AMSL)	Adjusted Freshwater Head (ft AMSL)
PZ-13	SR/DL	06/04/25	66.04	3,356.20	N/A
PZ-13	SR/DL	09/10/25	N/A	N/A	N/A
PZ-13	SR/DL	12/02/25	66.12	3,356.12	N/A
PZ-14	SR/DL	03/05/25	67.30	3,353.28	N/A
PZ-14	SR/DL	06/04/25	67.40	3,353.18	N/A
PZ-14	SR/DL	09/10/25	67.40	3,353.18	N/A
PZ-14	SR/DL	12/02/25	67.23	3,353.35	N/A
PZ-15	GAT	03/05/25	50.42	3,380.44	N/A
PZ-15	GAT	06/04/25	50.59	3,380.27	N/A
PZ-15	GAT	09/10/25	N/A	N/A	N/A
PZ-15	GAT	12/02/25	54.25	3,376.61	N/A
PZ-16	SR/DL	03/06/25	65.05	3,268.04	N/A
PZ-16	SR/DL	06/04/25	N/A	N/A	N/A
PZ-16	SR/DL	09/10/25	65.44	3,267.65	N/A
PZ-16	SR/DL	12/02/25	65.21	3,267.88	N/A
PZ-17a	SR/DL	03/05/25	N/A	N/A	N/A
PZ-17a	SR/DL	06/04/25	N/A	N/A	N/A
PZ-17a	SR/DL	09/10/25	N/A	N/A	N/A
PZ-17a	SR/DL	12/02/25	N/A	N/A	N/A
PZ-17b	DL	03/06/25	191.20	3,116.46	N/A
PZ-17b	DL	06/04/25	191.54	3,116.12	N/A
PZ-17b	DL	09/10/25	191.47	3,116.19	N/A
PZ-17b	DL	12/02/25	191.43	3,116.23	N/A
PZ-18	SR/DL	03/06/25	N/A	N/A	N/A
PZ-18	SR/DL	06/04/25	N/A	N/A	N/A
PZ-18	SR/DL	09/10/25	N/A	N/A	N/A
PZ-18	SR/DL	12/02/25	N/A	N/A	N/A
PZ-19	SR/DL	03/06/25	N/A	N/A	N/A
PZ-19	SR/DL	06/04/25	N/A	N/A	N/A
PZ-19	SR/DL	09/08/25	N/A	N/A	N/A
PZ-19	SR/DL	12/02/25	N/A	N/A	N/A

Zones:

B/C = Bell Canyon

CUL = Culebra

DL = Dewey Lake

GAT = Gatuña

MAG = Magenta

SR/DL = Santa Rosa/Dewey Lake

^a Adjusted Depth to Water. Depth to water is measured from inner casing except for wells that have a PIP installed to isolate the Culebra (e.g., C-2737), the tubing elevation may change when the packer is reset, and the adjustment value may need updating. The survey was taken from the outer casing and therefore the outer permanent casing is where the measurement is taken with a straight edge.

APPENDIX F - SUMMARY OF RADIOLOGICAL EFFLUENT AND ENVIRONMENTAL MONITORING PROGRAM DATA

Table F.1 – Station B Sample Results

(Refer to the end of each table for notes)

Mo.	Nuclide	Activity (Bq/Sample)	2σTPU ^a	MDC ^b
Jan	²⁴¹ Am	6.96E-03	2.22E-03	8.33E-04
Feb	²⁴¹ Am	8.25E-03	2.26E-03	8.92E-04
Mar	²⁴¹ Am	2.28E-03	1.13E-03	8.66E-04
Apr	²⁴¹ Am	3.53E-03	1.48E-03	9.14E-04
May	²⁴¹ Am	4.63E-03	1.57E-03	8.10E-04
Jun	²⁴¹ Am	1.37E-02	3.26E-03	7.55E-04
Jul	²⁴¹ Am	8.14E-03	2.16E-03	7.47E-04
Mo.	Nuclide	Activity (Bq/Sample)	2σTPU ^a	MDC ^b
Jan	^{239/240} Pu	6.03E-04	5.99E-04	6.33E-04
Feb	^{239/240} Pu	6.51E-04	6.33E-04	7.33E-04
Mar	^{239/240} Pu	3.04E-04	4.92E-04	7.88E-04
Apr	^{239/240} Pu	-9.88E-05	2.22E-04	7.70E-04
May	^{239/240} Pu	5.18E-04	5.70E-04	7.03E-04
Jun	^{239/240} Pu	2.06E-03	1.08E-03	7.14E-04
Jul	^{239/240} Pu	2.53E-03	1.27E-03	7.33E-04
Mo.	Nuclide	Activity (Bq/Sample)	2σTPU ^a	MDC ^b
Jan	^{233/234} U	1.52E-03	1.03E-03	1.33E-03
Feb	^{233/234} U	5.92E-04	5.99E-04	1.31E-03
Mar	^{233/234} U	8.10E-04	7.59E-04	1.35E-03
Apr	^{233/234} U	1.01E-03	9.47E-04	1.44E-03
May	^{233/234} U	1.06E-03	9.44E-04	1.38E-03
Jun	^{233/234} U	1.40E-03	9.84E-04	1.22E-03
Jul	^{233/234} U	8.07E-04	7.33E-04	1.19E-03

Mo.	Nuclide	Activity (Bq/Sample)	2σTPU ^a	MDC ^b
Jan	²³⁸ Pu	7.40E-05	3.06E-04	6.85E-04
Feb	²³⁸ Pu	1.73E-04	3.92E-04	7.03E-04
Mar	²³⁸ Pu	-6.51E-05	1.81E-04	7.03E-04
Apr	²³⁸ Pu	-3.45E-05	1.31E-04	6.25E-04
May	²³⁸ Pu	-9.25E-05	2.08E-04	7.70E-04
Jun	²³⁸ Pu	7.99E-05	2.90E-04	6.33E-04
Jul	²³⁸ Pu	1.98E-04	4.37E-04	7.51E-04
Mo.	Nuclide	Activity (Bq/Sample)	2σTPU ^a	MDC ^b
Jan	⁹⁰ Sr	-1.05E-03	1.91E-02	1.28E-02
Feb	⁹⁰ Sr	6.14E-03	1.82E-02	1.30E-02
Mar	⁹⁰ Sr	-6.55E-03	1.82E-02	1.31E-02
Apr	⁹⁰ Sr	3.52E-03	1.86E-02	1.23E-02
May	⁹⁰ Sr	-4.37E-03	1.88E-02	1.24E-02
Jun	⁹⁰ Sr	-4.66E-03	2.05E-02	1.07E-02
Jul	⁹⁰ Sr	1.01E-02	2.16E-02	1.08E-02
Mo.	Nuclide	Activity (Bq/Sample)	2σTPU ^a	MDC ^b
Jan	²³⁸ U	6.51E-04	6.77E-04	1.06E-03
Feb	²³⁸ U	4.48E-04	5.40E-04	1.04E-03
Mar	²³⁸ U	5.29E-04	6.14E-04	1.04E-03
Apr	²³⁸ U	2.70E-05	5.77E-04	1.27E-03
May	²³⁸ U	4.55E-04	6.88E-04	1.34E-03
Jun	²³⁸ U	1.05E-03	8.70E-04	1.16E-03
Jul	²³⁸ U	7.88E-04	7.36E-04	1.17E-03

Mo.	Nuclide	Activity (Bq/Sample)	2 σ TPU ^a	MDC ^b
Jan	¹³⁷ Cs	-1.79E-03	7.14E-02	1.26E-01
Feb	¹³⁷ Cs	5.92E-02	7.47E-02	1.36E-01
Mar	¹³⁷ Cs	2.93E-02	6.88E-02	1.20E-01
Apr	¹³⁷ Cs	5.00E-04	6.25E-02	1.11E-01
May	¹³⁷ Cs	-6.03E-03	6.14E-02	1.10E-01
Jun	¹³⁷ Cs	6.99E-03	6.40E-02	1.10E-01
Jul	¹³⁷ Cs	3.35E-04	6.29E-02	1.12E-01

- a. Total propagated uncertainty.
b. Minimum detectable concentration.

Table F.2 – Station C Sample Results

Qtr.	Nuclide	Activity (Bq/Sample)	2 σ TPU ^a	MDC ^b		Qtr.	Nuclide	Activity (Bq/Sample)	2 σ TPU ^a	MDC ^b
1st	²⁴¹ Am	2.70E-04	4.22E-04	7.36E-04		1st	²³⁸ Pu	7.07E-05	2.93E-04	6.96E-04
2nd	²⁴¹ Am	1.18E-02	1.31E-02	1.72E-02		2nd	²³⁸ Pu	8.21E-03	1.45E-02	2.19E-02
3rd	²⁴¹ Am	-2.02E-03	6.11E-03	1.71E-02		3rd	²³⁸ Pu	-3.08E-03	7.14E-03	2.11E-02
4th	²⁴¹ Am	1.29E-04	9.58E-03	2.13E-02		4th	²³⁸ Pu	-7.44E-03	7.18E-03	2.52E-02

Qtr.	Nuclide	Activity (Bq/Sample)	2 σ TPU ^a	MDC ^b		Qtr.	Nuclide	Activity (Bq/Sample)	2 σ TPU ^a	MDC ^b
1st	^{239/240} Pu	-5.81E-05	1.67E-04	6.55E-04		1st	⁹⁰ Sr	-6.44E-03	1.71E-02	1.26E-02
2nd	^{239/240} Pu	9.99E-04	1.04E-02	2.18E-02		2nd	⁹⁰ Sr	-3.25E-02	4.88E-02	8.66E-02
3rd	^{239/240} Pu	5.22E-03	1.64E-02	3.10E-02		3rd	⁹⁰ Sr	-1.02E-03	4.14E-02	7.14E-02
4th	^{239/240} Pu	4.26E-03	9.77E-03	1.55E-02		4th	⁹⁰ Sr	2.53E-02	3.33E-02	5.62E-02

Qtr.	Nuclide	Activity (Bq/Sample)	2 σ TPU ^a	MDC ^b		Qtr.	Nuclide	Activity (Bq/Sample)	2 σ TPU ^a	MDC ^b
1st	^{233/234} U	1.03E-03	8.07E-04	1.31E-03		1st	²³⁸ U	6.07E-04	6.36E-04	1.04E-03
2nd	^{233/234} U	-4.85E-03	1.27E-02	2.95E-02		2nd	²³⁸ U	-5.96E-03	7.36E-03	2.22E-02
3rd	^{233/234} U	-2.51E-03	1.44E-02	3.09E-02		3rd	²³⁸ U	1.12E-03	9.10E-03	1.85E-02
4th	^{233/234} U	-1.42E-02	1.43E-02	3.77E-02		4th	²³⁸ U	-3.96E-03	7.29E-03	2.08E-02

Qtr.	Nuclide	Activity (Bq/Sample)	2 σ TPU ^a	MDC ^b
1st	¹³⁷ Cs	7.03E-02	6.66E-02	1.30E-01
2nd	¹³⁷ Cs	-1.15E-01	4.00E-01	7.66E-01
3rd	¹³⁷ Cs	-2.66E-02	2.95E-01	6.11E-01
4th	¹³⁷ Cs	-6.77E-02	3.35E-01	6.70E-01

a. Total propagated uncertainty.

b. Minimum detectable concentration.

Table F.3 – Station G Sample Results

Mo.	Nuclide	Activity (Bq/Sample)	2 σ TPU ^a	MDC ^b	Mo.	Nuclide	Activity (Bq/Sample)	2 σ TPU ^a	MDC ^b
Jul	²⁴¹ Am	1.13E-03	1.18E-02	2.47E-02	Jul	²³⁸ Pu	7.59E-03	1.10E-02	1.32E-02
Aug	²⁴¹ Am	1.87E-03	8.40E-03	1.64E-02	Aug	²³⁸ Pu	3.27E-03	8.99E-03	1.56E-02
Sep	²⁴¹ Am	5.07E-03	1.58E-02	2.97E-02	Sep	²³⁸ Pu	3.56E-03	9.81E-03	1.70E-02
Oct	²⁴¹ Am	6.66E-04	6.96E-03	1.45E-02	Oct	²³⁸ Pu	1.04E-04	7.73E-03	1.72E-02
Nov	²⁴¹ Am	-3.03E-03	5.74E-03	1.77E-02	Nov	²³⁸ Pu	6.62E-04	6.92E-03	1.44E-02
Dec	²⁴¹ Am	-1.86E-03	8.44E-03	2.12E-02	Dec	²³⁸ Pu	1.99E-03	8.92E-03	1.75E-02

Mo.	Nuclide	Activity (Bq/Sample)	2 σ TPU ^a	MDC ^b	Mo.	Nuclide	Activity (Bq/Sample)	2 σ TPU ^a	MDC ^b
Jul	^{239/240} Pu	-1.98E-03	5.96E-03	1.68E-02	Jul	⁹⁰ Sr	1.40E-02	3.92E-02	6.81E-02
Aug	^{239/240} Pu	2.75E-03	1.06E-02	2.05E-02	Aug	⁹⁰ Sr	-2.63E-02	2.93E-02	5.44E-02
Sep	^{239/240} Pu	-5.33E-03	6.70E-03	2.23E-02	Sep	⁹⁰ Sr	-3.30E-02	4.00E-02	7.33E-02
Oct	^{239/240} Pu	1.04E-04	7.70E-03	1.71E-02	Oct	⁹⁰ Sr	3.70E-02	4.03E-02	6.77E-02
Nov	^{239/240} Pu	-2.26E-03	5.22E-03	1.55E-02	Nov	⁹⁰ Sr	2.97E-02	5.99E-02	1.02E-01
Dec	^{239/240} Pu	-3.48E-03	7.92E-03	2.15E-02	Dec	⁹⁰ Sr	-1.86E-02	3.56E-02	6.55E-02

Mo.	Nuclide	Activity (Bq/Sample)	2 σ TPU ^a	MDC ^b	Mo.	Nuclide	Activity (Bq/Sample)	2 σ TPU ^a	MDC ^b
Jul	^{233/234} U	-4.55E-03	9.32E-03	2.22E-02	Jul	²³⁸ U	-3.52E-03	6.59E-03	1.74E-02
Aug	^{233/234} U	1.05E-03	1.27E-02	2.52E-02	Aug	²³⁸ U	-1.90E-03	6.62E-03	1.63E-02
Sep	^{233/234} U	-3.59E-03	1.12E-02	2.71E-02	Sep	²³⁸ U	-2.78E-03	7.18E-03	1.94E-02
Oct	^{233/234} U	-1.25E-02	9.92E-03	2.70E-02	Oct	²³⁸ U	-2.67E-03	6.44E-03	1.65E-02
Nov	^{233/234} U	-1.34E-03	1.15E-02	2.52E-02	Nov	²³⁸ U	-4.55E-03	6.70E-03	1.98E-02
Dec	^{233/234} U	-1.53E-02	8.88E-03	3.01E-02	Dec	²³⁸ U	-1.20E-03	7.92E-03	1.85E-02

Mo.	Nuclide	Activity (Bq/Sample)	2 σ TPU ^a	MDC ^b
Jul	¹³⁷ Cs	-1.61E-01	3.39E-01	5.81E-01
Aug	¹³⁷ Cs	-1.50E-01	3.19E-01	5.88E-01
Sep	¹³⁷ Cs	3.85E-02	2.55E-01	5.33E-01
Oct	¹³⁷ Cs	2.02E-01	3.10E-01	6.73E-01
Nov	¹³⁷ Cs	-5.70E-02	2.60E-01	4.85E-01
Dec	¹³⁷ Cs	-8.25E-02	2.33E-01	4.66E-01

a. Total propagated uncertainty.

b. Minimum detectable concentration.

Table F.4 – Radionuclide Activity in Quarterly Ambient Air Filter Composite Samples Collected from Locations on and Near the WIPP Site

Location	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d
	^{233/234} U				²³⁵ U				²³⁸ U			
WFF ^e	1.62E-02	3.41E-02	5.14E-03	U	4.90E-04	1.72E-03	1.78E-03	U	1.66E-02	3.23E-02	5.48E-03	U
	4.24E-03	4.12E-03	5.35E-03	U	5.51E-04	1.12E-03	1.82E-03	U	3.16E-03	3.85E-03	5.75E-03	U
	1.19E-02	2.27E-02	3.71E-02	HhU	-3.01E-03	1.34E-02	3.48E-02	HhU	5.28E-03	1.81E-02	3.35E-02	HhU
	3.39E-03	2.35E-02	4.82E-02	HhU	1.96E-02	2.83E-02	3.40E-02	HhU	1.03E-02	2.35E-02	4.03E-02	HhU
WEE	1.83E-02	3.65E-02	5.15E-03	U	4.99E-04	1.68E-03	1.81E-03	U	1.80E-02	3.42E-02	5.48E-03	U
	1.47E-03	3.82E-03	5.34E-03	U	-2.36E-04	7.96E-04	1.78E-03	U	2.73E-03	3.77E-03	5.75E-03	U
	1.11E-02	2.32E-02	4.05E-02	HhU	1.02E-02	2.01E-02	2.78E-02	HhU	1.45E-02	2.35E-02	3.79E-02	HhU
	3.34E-02	3.27E-02	4.48E-02	HhU	-4.34E-03	1.31E-02	3.68E-02	HhU	1.97E-02	2.41E-02	3.21E-02	HhU
WSS	1.78E-02	3.57E-02	5.13E-03	U	1.40E-03	2.69E-03	1.74E-03	U	1.82E-02	3.41E-02	5.45E-03	U
	1.41E-02	5.20E-03	5.34E-03	=	3.92E-04	1.04E-03	1.78E-03	U	8.81E-03	4.41E-03	5.75E-03	=
	2.06E-02	3.48E-02	5.49E-02	U	9.76E-03	2.86E-02	4.68E-02	U	2.58E-02	3.34E-02	4.09E-02	U
	-9.56E-03	1.85E-02	5.24E-02	HhU	5.71E-03	2.14E-02	3.60E-02	HhU	1.68E-02	2.43E-02	2.91E-02	HhU
MLR	2.08E-02	4.04E-02	5.16E-03	U	1.76E-03	3.29E-03	1.80E-03	U	2.21E-02	4.04E-02	5.49E-03	U
	6.89E-03	4.27E-03	5.34E-03	=	6.78E-04	1.12E-03	1.77E-03	U	1.18E-02	4.67E-03	5.74E-03	=
	-1.11E-03	3.92E-02	8.82E-02	HhU	-3.21E-03	2.78E-02	6.41E-02	HhU	3.03E-02	4.93E-02	7.59E-02	HhU
	1.96E-02	2.71E-02	4.22E-02	HhU	-1.41E-03	1.22E-02	2.81E-02	HhU	2.14E-02	2.32E-02	2.63E-02	HhU
SEC	1.82E-02	3.73E-02	5.17E-03	U	1.63E-03	3.11E-03	1.81E-03	U	2.00E-02	3.76E-02	5.50E-03	U
	1.42E-02	5.38E-03	5.38E-03	=	4.50E-04	1.08E-03	1.84E-03	U	9.18E-03	4.58E-03	5.79E-03	=
	-6.92E-03	1.98E-02	5.31E-02	HhU	1.45E-02	2.86E-02	3.95E-02	HhU	1.87E-03	1.96E-02	4.08E-02	HhU
	3.54E-04	2.40E-02	5.22E-02	HhU	1.26E-02	2.48E-02	3.43E-02	HhU	3.36E-02	3.31E-02	4.06E-02	HhU
CBD	2.26E-02	4.41E-02	5.17E-03	U	2.00E-03	3.75E-03	1.78E-03	U	2.38E-02	4.42E-02	5.49E-03	U
	2.03E-02	6.74E-03	5.41E-03	=	1.07E-03	1.34E-03	1.90E-03	U	1.40E-02	5.55E-03	5.80E-03	=
	1.20E-02	2.33E-02	3.95E-02	HhU	-1.40E-03	1.21E-02	2.79E-02	HhU	1.07E-02	1.90E-02	2.88E-02	HhU

Location	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d
	9.24E-03	2.89E-02	5.42E-02	U	3.30E-04	2.45E-02	5.44E-02	U	1.60E-02	2.79E-02	4.40E-02	U
SMR	2.17E-02	4.06E-02	5.14E-03	U	8.12E-04	1.98E-03	1.76E-03	U	2.02E-02	3.68E-02	5.47E-03	U
	1.50E-02	5.59E-03	5.40E-03	=	7.98E-04	1.23E-03	1.91E-03	U	1.33E-02	5.20E-03	5.78E-03	=
	4.02E-03	2.78E-02	5.68E-02	HhU	-3.56E-03	1.58E-02	4.11E-02	HhU	2.88E-02	3.21E-02	4.21E-02	HhU
	5.54E-03	2.17E-02	4.20E-02	HhU	2.66E-04	1.97E-02	4.38E-02	HhU	1.12E-02	2.48E-02	4.34E-02	HhU
SOO	2.35E-02	4.87E-02	5.21E-03	U	1.99E-03	4.02E-03	1.85E-03	U	2.42E-02	4.81E-02	5.54E-03	U
	1.18E-02	4.68E-03	5.31E-03	=	4.57E-04	1.03E-03	1.74E-03	U	1.17E-02	4.53E-03	5.71E-03	=
	-8.17E-03	2.38E-02	6.04E-02	HhU	1.02E-02	2.80E-02	4.85E-02	HhU	2.75E-02	3.16E-02	3.92E-02	HhU
	1.05E-02	2.47E-02	4.42E-02	HhU	9.33E-03	2.15E-02	3.40E-02	HhU	1.39E-02	2.26E-02	3.48E-02	HhU
Mean ^f	1.13E-02	2.42E-02	2.80E-02	N/A	2.82E-03	1.16E-02	2.06E-02	N/A	1.64E-02	2.42E-02	2.25E-02	N/A
Minimum	-9.56E-03	3.82E-03	5.13E-03	WSS (4)	-4.34E-03	7.96E-04	1.74E-03	WEE (4)	1.87E-03	3.77E-03	5.45E-03	WEE (2)
Maximum	3.34E-02	4.87E-02	8.82E-02	SOO (1)	1.96E-02	2.86E-02	6.41E-02	WFF (4)	3.36E-02	4.93E-02	7.59E-02	MLR (3)
WAB	1.06E-02	1.67E-02	5.14E-03	U	4.54E-04	9.21E-04	1.75E-03	U	8.93E-03	1.41E-02	5.47E-03	U
(Filter	8.46E-03	2.66E-03	5.36E-03	=	4.60E-04	6.67E-04	1.83E-03	U	7.86E-03	2.53E-03	5.76E-03	=
Blank)	3.10E-02	3.57E-02	4.99E-02	HhU	1.95E-02	3.11E-02	4.28E-02	HhU	5.26E-03	2.62E-02	5.25E-02	HhU
	7.41E-03	1.94E-02	3.51E-02	HhU	1.34E-02	2.14E-02	2.95E-02	HhU	1.86E-02	2.32E-02	3.34E-02	HhU

Location	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d
	²³⁸ Pu				^{239/240} Pu				²⁴¹ Am			
WFF ^e	-9.60E-05	1.67E-04	7.58E-04	U	1.35E-04	3.57E-04	8.16E-04	U	-4.12E-04	7.78E-04	1.16E-03	U
	-1.14E-04	3.66E-04	7.55E-04	U	-2.08E-04	4.55E-04	8.44E-04	U	-1.46E-04	2.86E-04	1.15E-03	U
	-2.56E-04	9.96E-03	2.24E-02	HhU	7.25E-03	1.31E-02	1.99E-02	HhU	-2.65E-02	1.87E-02	6.16E-02	HhU
	4.38E-03	1.64E-02	2.76E-02	HhU	-6.42E-03	2.19E-02	5.43E-02	HhU	1.07E-03	4.91E-02	1.08E-01	HhU
WEE	-1.33E-04	3.57E-04	7.97E-04	U	2.22E-04	4.90E-04	8.82E-04	U	-1.56E-04	8.31E-04	1.11E-03	U
	-4.12E-05	3.20E-04	7.47E-04	U	-1.36E-04	4.04E-04	8.60E-04	U	5.33E-05	3.79E-04	1.08E-03	U
	4.27E-03	1.16E-02	2.08E-02	HhU	7.19E-03	1.10E-02	1.44E-02	HhU	-6.97E-03	1.13E-02	3.58E-02	HhU
	-1.18E-03	7.21E-03	1.74E-02	HhU	-1.43E-03	1.04E-02	2.48E-02	HhU	-1.46E-02	2.86E-02	7.97E-02	HhU
WSS	1.40E-04	4.22E-04	7.28E-04	U	2.62E-04	4.02E-04	7.89E-04	U	-5.20E-04	6.96E-04	1.09E-03	U
	-1.22E-04	3.76E-04	8.27E-04	U	-6.89E-05	5.03E-04	8.66E-04	U	-1.31E-04	2.57E-04	1.11E-03	U
	-3.59E-03	1.76E-02	4.19E-02	U	3.05E-03	1.80E-02	3.63E-02	U	5.64E-03	2.12E-02	3.87E-02	U
	-7.10E-03	7.89E-03	2.56E-02	HhU	5.39E-03	1.17E-02	1.96E-02	HhU	-1.51E-02	2.96E-02	8.22E-02	HhU
MLR	1.18E-05	4.06E-04	8.40E-04	U	-1.21E-04	2.51E-04	9.27E-04	U	-5.28E-04	7.15E-04	1.13E-03	U
	-1.30E-04	3.88E-04	8.12E-04	U	1.07E-05	6.02E-04	8.93E-04	U	2.28E-04	5.42E-04	1.08E-03	U
	4.35E-02	2.40E-02	1.58E-02	Hh=	4.60E-02	2.55E-02	2.25E-02	Hh=	8.06E-02	4.71E-02	4.36E-02	Hh=
	-6.15E-03	3.62E-02	8.60E-02	HhU	-4.36E-02	2.75E-02	1.03E-01	HhU	-3.87E-03	4.65E-02	1.04E-01	HhU
SEC	3.51E-05	3.77E-04	7.85E-04	U	-1.36E-04	2.76E-04	9.21E-04	U	-3.04E-04	7.74E-04	1.08E-03	U
	-1.07E-04	3.55E-04	7.68E-04	U	-2.17E-04	4.65E-04	9.18E-04	U	1.18E-04	3.78E-04	1.06E-03	U
	-3.19E-03	7.14E-03	2.06E-02	HhU	1.36E-02	1.45E-02	1.56E-02	HhU	-1.56E-02	2.01E-02	5.97E-02	HhU
	-2.94E-03	6.57E-03	1.90E-02	HhU	1.52E-03	1.01E-02	2.06E-02	HhU	-5.53E-03	3.82E-02	9.30E-02	HhU
CBD	-8.88E-05	2.99E-04	7.83E-04	U	2.53E-04	4.61E-04	8.69E-04	U	-1.68E-04	7.89E-04	1.07E-03	U
	-1.10E-04	3.60E-04	8.12E-04	U	-1.02E-04	5.41E-04	9.32E-04	U	2.76E-04	5.71E-04	1.17E-03	U
	-1.31E-03	9.49E-03	2.26E-02	HhU	5.67E-03	1.23E-02	2.06E-02	HhU	-2.36E-02	2.62E-02	7.98E-02	HhU
	-2.18E-03	1.20E-02	3.01E-02	U	4.54E-03	1.39E-02	2.50E-02	U	1.10E-02	3.82E-02	7.18E-02	U

Location	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d
SMR	-1.06E-04	3.23E-04	7.95E-04	U	-2.41E-05	3.75E-04	9.25E-04	U	-9.09E-05	8.45E-04	1.10E-03	U
	-1.22E-04	3.76E-04	8.27E-04	U	4.07E-04	7.30E-04	9.32E-04	U	-1.42E-04	2.78E-04	1.17E-03	U
	-3.52E-03	1.01E-02	2.62E-02	HhU	8.81E-03	1.39E-02	2.11E-02	HhU	-5.98E-03	1.39E-02	4.10E-02	HhU
	7.37E-03	2.03E-02	3.52E-02	HhU	-2.75E-03	1.22E-02	3.17E-02	HhU	8.62E-04	3.97E-02	8.71E-02	HhU
SOO	1.72E-06	4.05E-04	8.03E-04	U	2.58E-04	4.40E-04	8.28E-04	U	-9.28E-05	8.89E-04	1.26E-03	U
	2.18E-05	4.01E-04	7.71E-04	U	-1.07E-04	5.19E-04	8.51E-04	U	1.26E-04	4.03E-04	1.07E-03	U
	8.36E-03	1.32E-02	2.00E-02	HhU	-3.07E-03	6.88E-03	1.99E-02	HhU	-2.15E-03	2.01E-02	4.65E-02	HhU
	3.33E-03	1.73E-02	3.41E-02	HhU	-2.55E-03	1.04E-02	2.60E-02	HhU	-1.81E-02	2.81E-02	8.10E-02	HhU
Mean^f	1.21E-03	7.27E-03	1.49E-02	N/A	1.36E-03	7.52E-03	1.53E-02	N/A	-1.27E-03	1.52E-02	3.54E-02	N/A
Minimum	-7.10E-03	1.67E-04	7.28E-04	WSS (4)	-4.36E-02	2.51E-04	7.89E-04	MLR (4)	-2.65E-02	2.57E-04	1.06E-03	WFF (3)
Maximum	4.35E-02	3.62E-02	8.60E-02	MLR (3)	4.60E-02	2.75E-02	1.03E-01	MLR (3)	8.06E-02	4.91E-02	1.08E-01	WFF (4)
WAB	4.11E-05	2.81E-04	7.63E-04	U	-4.84E-05	1.44E-04	8.22E-04	U	5.87E-04	6.50E-04	1.21E-03	U
(Filter	-5.82E-05	1.67E-04	8.54E-04	U	-9.11E-05	2.09E-04	9.41E-04	U	8.14E-05	3.15E-04	1.13E-03	U
Blank)	5.60E-03	1.82E-02	3.44E-02	HhU	4.51E-03	1.61E-02	3.06E-02	HhU	-2.43E-03	1.08E-02	2.80E-02	HhU
	4.08E-03	1.15E-02	1.99E-02	HhU	7.23E-03	1.31E-02	1.98E-02	HhU	-9.40E-03	1.84E-02	5.13E-02	HhU

Location	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d
	⁴⁰ K				⁶⁰ Co				¹³⁷ Cs			
WFF ^e	2.79E+00	1.81E+00	3.44E+00	U	7.15E-03	1.58E-01	2.84E-01	U	-2.09E-02	1.27E-01	2.27E-01	U
	-6.88E-01	1.17E+00	2.57E+00	U	6.01E-02	1.62E-01	1.99E-01	U	-8.45E-02	1.24E-01	2.04E-01	U
	0.00E+00	3.01E+00	2.76E+00	HhU	2.48E-01	3.02E-01	6.48E-01	HhU	-4.72E-02	2.38E-01	4.21E-01	HhU
	-2.03E+00	2.83E+00	5.45E+00	HhU	-1.13E-01	1.93E-01	3.36E-01	HhU	-8.85E-03	1.46E-01	2.81E-01	HhU
WEE	1.31E+00	1.54E+00	3.17E+00	U	6.19E-02	1.50E-01	2.76E-01	U	-6.37E-02	1.31E-01	2.21E-01	U
	1.37E+00	2.31E+00	3.85E+00	U	1.14E-01	1.33E-01	2.10E-01	U	-2.52E-02	1.33E-01	2.37E-01	U
	0.00E+00	4.48E+00	3.43E+00	HhU	-1.91E-01	2.84E-01	3.97E-01	HhU	-6.09E-02	2.10E-01	3.58E-01	HhU
	2.01E+00	5.68E+00	4.62E+00	HhU	1.54E-01	2.09E-01	5.00E-01	HhU	0.00E+00	3.40E-01	4.24E-01	HhU
WSS	4.26E+00	1.70E+00	3.91E+00	=	-5.03E-02	1.44E-01	2.46E-01	U	-3.39E-02	1.14E-01	2.08E-01	U
	3.00E+00	1.55E+00	3.53E+00	U	-1.03E-01	1.64E-01	2.74E-01	U	-8.45E-02	1.33E-01	2.35E-01	U
	-2.68E+00	3.53E+00	6.27E+00	U	7.95E-02	2.34E-01	4.51E-01	U	1.14E-01	1.59E-01	3.32E-01	U
	-2.46E+00	3.30E+00	5.71E+00	HhU	2.63E-01	3.35E-01	7.34E-01	HhU	7.45E-02	1.93E-01	4.17E-01	HhU
MLR	3.57E+00	1.59E+00	3.67E+00	U	9.73E-02	1.46E-01	2.46E-01	U	-7.06E-02	1.06E-01	1.88E-01	U
	2.92E+00	1.44E+00	3.36E+00	U	8.04E-02	1.53E-01	2.76E-01	U	-4.00E-02	1.24E-01	2.25E-01	U
	-4.06E+00	5.15E+00	1.12E+01	HhU	5.72E-01	5.50E-01	1.20E+00	HhU	-2.38E-01	3.60E-01	5.44E-01	HhU
	6.51E-01	4.04E+00	8.40E+00	HhU	6.30E-02	2.31E-01	5.21E-01	HhU	8.55E-02	2.35E-01	4.63E-01	HhU
SEC	4.85E+00	1.85E+00	4.21E+00	=	3.91E-03	1.58E-01	2.63E-01	U	9.81E-02	1.33E-01	2.50E-01	U
	4.34E+00	1.87E+00	4.20E+00	=	2.43E-02	1.27E-01	2.58E-01	U	-5.16E-02	1.21E-01	2.17E-01	U
	-1.37E+00	2.53E+00	4.88E+00	HhU	1.17E-01	2.05E-01	4.67E-01	HhU	-7.34E-02	1.73E-01	2.93E-01	HhU
	-1.47E+00	3.85E+00	8.31E+00	HhU	7.93E-02	3.27E-01	7.67E-01	HhU	-1.99E-01	3.38E-01	5.45E-01	HhU
CBD	2.18E+00	2.09E+00	3.42E+00	U	5.95E-02	1.42E-01	2.68E-01	U	3.33E-02	1.38E-01	2.60E-01	U
	-1.93E+00	2.15E+00	2.28E+00	U	1.18E-01	1.40E-01	2.32E-01	U	-1.81E-02	1.25E-01	2.16E-01	U
	1.36E+00	3.54E+00	4.97E+00	HhU	7.19E-01	6.02E-01	7.84E-01	HhU	-5.44E-02	2.05E-01	3.91E-01	HhU
	-2.06E+00	3.20E+00	5.67E+00	U	8.43E-02	2.43E-01	5.30E-01	U	9.81E-02	2.23E-01	4.68E-01	U

Location	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d
SMR	3.64E+00	1.76E+00	3.83E+00	U	-7.91E-02	1.52E-01	2.56E-01	U	-5.48E-02	1.54E-01	2.62E-01	U
	2.90E+00	1.35E+00	3.12E+00	U	-1.57E-02	1.09E-01	2.12E-01	U	-1.83E-02	1.39E-01	2.40E-01	U
	6.73E-01	5.34E+00	1.28E+01	HhU	1.57E+00	9.54E-01	7.68E-01	Hh=	7.63E-03	3.80E-01	7.23E-01	HhU
	-3.68E+00	4.25E+00	8.03E+00	HhU	9.24E-02	2.52E-01	5.35E-01	HhU	-1.57E-01	1.96E-01	2.74E-01	HhU
SOO	5.39E+00	1.77E+00	4.18E+00	=	5.69E-02	1.46E-01	2.81E-01	U	-1.22E-03	1.26E-01	2.24E-01	U
	3.22E+00	1.50E+00	3.34E+00	U	5.72E-02	9.64E-02	2.13E-01	U	2.57E-02	1.25E-01	2.27E-01	U
	-5.85E-01	2.83E+00	5.07E+00	HhU	-7.17E-02	2.17E-01	4.15E-01	HhU	-2.02E-02	1.45E-01	2.79E-01	HhU
	2.37E+00	4.67E+00	1.01E+01	HhU	7.08E+00	1.52E+00	7.52E-01	Hh=	1.33E-01	3.12E-01	6.57E-01	HhU
Mean^f	9.31E-01	2.80E+00	5.12E+00	N/A	3.51E-01	2.76E-01	4.31E-01	N/A	-2.36E-02	1.85E-01	3.28E-01	N/A
Minimum	-4.06E+00	1.17E+00	2.28E+00	MLR (3)	-1.91E-01	9.64E-02	1.99E-01	WEE (3)	-2.38E-01	1.06E-01	1.88E-01	MLR (3)
Maximum	5.39E+00	5.68E+00	1.28E+01	SOO (1)	7.08E+00	1.52E+00	1.20E+00	SOO (4)	1.33E-01	3.80E-01	7.23E-01	SOO (4)
WAB	-8.92E-01	2.24E+00	3.58E+00	U	-1.36E-01	1.76E-01	2.85E-01	U	5.99E-02	1.35E-01	2.73E-01	U
(Filter	3.31E+00	1.77E+00	3.81E+00	U	4.53E-02	1.42E-01	2.15E-01	U	3.95E-02	1.50E-01	2.72E-01	U
Blank)	-3.34E+00	3.75E+00	5.83E+00	HhU	8.11E-02	2.91E-01	6.34E-01	HhU	-2.88E-02	2.19E-01	4.04E-01	HhU
	3.43E+00	3.61E+00	3.57E+00	HhU	5.37E-02	1.61E-01	3.76E-01	HhU	1.04E-01	1.78E-01	3.61E-01	HhU

Location	[RN] ^a	2 σ TPU ^{2ba}	MDC ^c	Q ^d
	⁹⁰ Sr			
WFF ^e	-8.03E-03	1.65E-02	3.23E-02	U
	6.18E-03	1.73E-02	3.06E-02	U
	-1.04E-01	8.53E-02	1.97E-01	HhU
	-9.49E-03	1.04E-01	2.10E-01	HhU
WEE	9.12E-03	1.75E-02	3.22E-02	U
	3.16E-03	1.88E-02	3.08E-02	U
	-1.33E-01	1.08E-01	2.52E-01	HhU
	1.26E-02	9.55E-02	1.83E-01	HhU
WSS	5.15E-03	2.05E-02	3.28E-02	U
	2.03E-03	1.81E-02	3.07E-02	U
	1.63E-02	1.30E-01	2.45E-01	U
	-1.01E-01	8.21E-02	1.91E-01	HhU
MLR	-1.09E-02	1.73E-02	3.24E-02	U
	6.43E-03	1.71E-02	3.05E-02	U
	1.68E-01	2.40E-01	4.03E-01	HhU
	-3.07E-02	1.08E-01	2.17E-01	HhU
SEC	-2.85E-03	1.74E-02	3.24E-02	U
	1.51E-03	1.24E-02	3.07E-02	U
	5.63E-02	1.73E-01	3.08E-01	HhU
	1.12E-02	9.11E-02	1.73E-01	HhU
CBD	-2.62E-03	1.70E-02	3.23E-02	U
	5.36E-03	1.75E-02	3.06E-02	U
	-3.85E-02	1.65E-01	3.10E-01	HhU
	1.17E-01	1.41E-01	2.32E-01	U

Location	[RN] ^a	2 σ TPU ^{2ba}	MDC ^c	Q ^d
SMR	4.18E-03	1.70E-02	3.22E-02	U
	1.51E-02	1.76E-02	3.05E-02	U
	4.31E-02	1.51E-01	2.74E-01	HhU
	-1.02E-01	7.71E-02	1.86E-01	HhU
SOO	-4.20E-03	1.78E-02	3.24E-02	U
	7.79E-03	1.83E-02	3.07E-02	U
	1.53E-01	2.12E-01	3.55E-01	HhU
	3.38E-02	9.50E-02	1.77E-01	HhU
Mean^f	4.06E-03	7.30E-02	1.38E-01	N/A
Minimum	-1.33E-01	1.24E-02	3.05E-02	WEE (3)
Maximum	1.68E-01	2.40E-01	4.03E-01	MLR (3)
WAB	1.11E-02	1.35E-02	3.24E-02	U
(Filter	0.00E+00	1.26E-02	3.07E-02	U
Blank)	2.18E-01	2.05E-01	3.22E-01	U
	-3.63E-02	8.34E-02	1.77E-01	U

Notes. Units are Bq/sample. See appendix B for sampling location codes.

- Radionuclide activity. Only radionuclides with activities greater than 2 σ TPU and the MDC are considered detections. Samples may have a negative value when background radioactivity is subtracted.
- Total propagated uncertainty.
- Minimum detectable concentration.
- Qualifier. Indicates whether a radionuclide was detected. Equal sign (=) denotes detected. U denotes undetected. H denotes the analytical holding time was exceeded. Lowercase 'h' denotes the preparation or preservation holding time was exceeded. I denotes uncertain identification.
- Samples were composited on a quarterly basis. The mean was calculated for samples from WFF in Quarter 1, WEE in Quarter 2, WSS in Quarter 3, and CBD in Quarter 4.
- Non-relational values are presented for the mean. In all other cases, [RN], 2 σ TPU, and MDC are a data set.

Table F.5 – Radionuclide Activity in Quarterly Air Filter Composite Samples Collected from Locations on and Near the WIPP Site*(Refer to the end of the table for notes)*

Location	Volume (m ³)	Bq/sample	Bq/m ³	Bq/sample	Bq/m ³	Bq/sample	Bq/m ³	Bq/sample	Bq/m ³	Bq/sample	Bq/m ³
		^{233/234} U		²³⁵ U		²³⁸ U		²³⁸ Pu		^{239/240} Pu	
WFF ^a	7340.91	1.62E-02	2.21E-06	4.90E-04	6.67E-08	1.66E-02	2.26E-06	-9.60E-05	-1.31E-08	1.35E-04	1.84E-08
	7324.30	4.24E-03	5.79E-07	5.51E-04	7.52E-08	3.16E-03	4.31E-07	-1.14E-04	-1.56E-08	-2.08E-04	-2.84E-08
	7291.84	1.19E-02	1.63E-06	-3.01E-03	-4.13E-07	5.28E-03	7.24E-07	-2.56E-04	-3.51E-08	7.25E-03	9.94E-07
	7958.36	3.39E-03	4.26E-07	1.96E-02	2.46E-06	1.03E-02	1.29E-06	4.38E-03	5.50E-07	-6.42E-03	-8.07E-07
WEE	7322.30	1.83E-02	2.50E-06	4.99E-04	6.81E-08	1.80E-02	2.46E-06	-1.33E-04	-1.82E-08	2.22E-04	3.03E-08
	4682.47	1.47E-03	3.14E-07	-2.36E-04	-5.04E-08	2.73E-03	5.83E-07	-4.12E-05	-8.80E-09	-1.36E-04	-2.90E-08
	7281.90	1.11E-02	1.52E-06	1.02E-02	1.40E-06	1.45E-02	1.99E-06	4.27E-03	5.86E-07	7.19E-03	9.87E-07
	7015.89	3.34E-02	4.76E-06	-4.34E-03	-6.19E-07	1.97E-02	2.81E-06	-1.18E-03	-1.68E-07	-1.43E-03	-2.04E-07
WSS	7372.10	1.78E-02	2.41E-06	1.40E-03	1.90E-07	1.82E-02	2.47E-06	1.40E-04	1.90E-08	2.62E-04	3.55E-08
	7414.40	1.41E-02	1.90E-06	3.92E-04	5.29E-08	8.81E-03	1.19E-06	-1.22E-04	-1.65E-08	-6.89E-05	-9.29E-09
	6270.92	2.06E-02	3.29E-06	9.76E-03	1.56E-06	2.58E-02	4.11E-06	-3.59E-03	-5.72E-07	3.05E-03	4.86E-07
	7852.11	-9.56E-03	-1.22E-06	5.71E-03	7.27E-07	1.68E-02	2.14E-06	-7.10E-03	-9.04E-07	5.39E-03	6.86E-07
MLR	7417.35	2.08E-02	2.80E-06	1.76E-03	2.37E-07	2.21E-02	2.98E-06	1.18E-05	1.59E-09	-1.21E-04	-1.63E-08
	7380.10	6.89E-03	9.34E-07	6.78E-04	9.19E-08	1.18E-02	1.60E-06	-1.30E-04	-1.76E-08	1.07E-05	1.45E-09
	6573.37	-1.11E-03	-1.69E-07	-3.21E-03	-4.88E-07	3.03E-02	4.61E-06	4.35E-02	6.62E-06	4.60E-02	7.00E-06
	7939.03	1.96E-02	2.47E-06	-1.41E-03	-1.78E-07	2.14E-02	2.70E-06	-6.15E-03	-7.75E-07	-4.36E-02	-5.49E-06
SEC	7313.58	1.82E-02	2.49E-06	1.63E-03	2.23E-07	2.00E-02	2.73E-06	3.51E-05	4.80E-09	-1.36E-04	-1.86E-08
	7263.21	1.42E-02	1.96E-06	4.50E-04	6.20E-08	9.18E-03	1.26E-06	-1.07E-04	-1.47E-08	-2.17E-04	-2.99E-08
	7437.45	-6.92E-03	-9.30E-07	1.45E-02	1.95E-06	1.87E-03	2.51E-07	-3.19E-03	-4.29E-07	1.36E-02	1.83E-06
	8053.24	3.54E-04	4.40E-08	1.26E-02	1.56E-06	3.36E-02	4.17E-06	-2.94E-03	-3.65E-07	1.52E-03	1.89E-07
CBD	7545.93	2.26E-02	2.99E-06	2.00E-03	2.65E-07	2.38E-02	3.15E-06	-8.88E-05	-1.18E-08	2.53E-04	3.35E-08
	7433.64	2.03E-02	2.73E-06	1.07E-03	1.44E-07	1.40E-02	1.88E-06	-1.10E-04	-1.48E-08	-1.02E-04	-1.37E-08
	7447.74	1.20E-02	1.61E-06	-1.40E-03	-1.88E-07	1.07E-02	1.44E-06	-1.31E-03	-1.76E-07	5.67E-03	7.61E-07
	7892.42	9.24E-03	1.17E-06	3.30E-04	4.18E-08	1.60E-02	2.03E-06	-2.18E-03	-2.76E-07	4.54E-03	5.75E-07

Location	Volume (m ³)	Bq/sample	Bq/m ³	Bq/sample	Bq/m ³	Bq/sample	Bq/m ³	Bq/sample	Bq/m ³	Bq/sample	Bq/m ³
SMR	7257.13	2.17E-02	2.99E-06	8.12E-04	1.12E-07	2.02E-02	2.78E-06	-1.06E-04	-1.46E-08	-2.41E-05	-3.32E-09
	7330.54	1.50E-02	2.05E-06	7.98E-04	1.09E-07	1.33E-02	1.81E-06	-1.22E-04	-1.66E-08	4.07E-04	5.55E-08
	6066.22	4.02E-03	6.63E-07	-3.56E-03	-5.87E-07	2.88E-02	4.75E-06	-3.52E-03	-5.80E-07	8.81E-03	1.45E-06
	7919.99	5.54E-03	6.99E-07	2.66E-04	3.36E-08	1.12E-02	1.41E-06	7.37E-03	9.31E-07	-2.75E-03	-3.47E-07
SOO	7332.91	2.35E-02	3.20E-06	1.99E-03	2.71E-07	2.42E-02	3.30E-06	1.72E-06	2.35E-10	2.58E-04	3.52E-08
	7268.43	1.18E-02	1.62E-06	4.57E-04	6.29E-08	1.17E-02	1.61E-06	2.18E-05	3.00E-09	-1.07E-04	-1.47E-08
	7051.16	-8.17E-03	-1.16E-06	1.02E-02	1.45E-06	2.75E-02	3.90E-06	8.36E-03	1.19E-06	-3.07E-03	-4.35E-07
	7603.82	1.05E-02	1.38E-06	4.90E-04	6.44E-08	1.39E-02	1.83E-06	3.33E-03	4.38E-07	-2.55E-03	-3.35E-07
Mean ^b	7270.46	1.13E-02	1.56E-06	2.55E-03	3.36E-07	1.64E-02	2.27E-06	1.21E-03	1.84E-07	1.36E-03	2.31E-07
Minimum	4682.47	-9.56E-03	-1.22E-06	-4.34E-03	-6.19E-07	1.87E-03	2.51E-07	-7.10E-03	-9.04E-07	-4.36E-02	-5.49E-06
Maximum	8053.24	3.34E-02	4.76E-06	1.96E-02	2.46E-06	3.36E-02	4.75E-06	4.35E-02	6.62E-06	4.60E-02	7.00E-06
		^a Am		⁴⁰ K		⁶⁰ Co		¹³⁷ Cs		⁹⁰ Sr	
WFF ^a	7340.91	-4.12E-04	-5.61E-08	2.79E+00	3.80E-04	7.15E-03	9.74E-07	-2.09E-02	-2.85E-06	-8.03E-03	-1.09E-06
	7324.3	-1.46E-04	-1.99E-08	-6.88E-01	-9.39E-05	6.01E-02	8.21E-06	-8.45E-02	-1.15E-05	6.18E-03	8.44E-07
	7291.84	-2.65E-02	-3.63E-06	0.00E+00	0.00E+00	2.48E-01	3.40E-05	-4.72E-02	-6.47E-06	-1.04E-01	-1.43E-05
	7958.36	1.07E-03	1.34E-07	-2.03E+00	-2.55E-04	-1.13E-01	-1.42E-05	-8.85E-03	-1.11E-06	-9.49E-03	-1.19E-06
WEE	7322.3	-1.56E-04	-2.13E-08	1.31E+00	1.79E-04	6.19E-02	8.45E-06	-6.37E-02	-8.70E-06	9.12E-03	1.25E-06
	4682.47	5.33E-05	1.14E-08	1.37E+00	2.93E-04	1.14E-01	2.43E-05	-2.52E-02	-5.38E-06	3.16E-03	6.75E-07
	7281.9	-6.97E-03	-9.57E-07	0.00E+00	0.00E+00	-1.91E-01	-2.62E-05	-6.09E-02	-8.36E-06	-1.33E-01	-1.83E-05
	7015.89	-1.46E-02	-2.08E-06	2.01E+00	2.86E-04	1.54E-01	2.20E-05	0.00E+00	0.00E+00	1.26E-02	1.80E-06
WSS	7372.1	-5.20E-04	-7.05E-08	4.26E+00	5.78E-04	-5.03E-02	-6.82E-06	-3.39E-02	-4.60E-06	5.15E-03	6.99E-07
	7414.4	-1.31E-04	-1.77E-08	3.00E+00	4.05E-04	-1.03E-01	-1.39E-05	-8.45E-02	-1.14E-05	2.03E-03	2.74E-07
	6270.92	5.64E-03	8.99E-07	-2.68E+00	-4.27E-04	7.95E-02	1.27E-05	1.14E-01	1.82E-05	1.63E-02	2.60E-06
	7852.11	-1.51E-02	-1.92E-06	-2.46E+00	-3.13E-04	2.63E-01	3.35E-05	7.45E-02	9.49E-06	-1.01E-01	-1.29E-05
MLR	7417.35	-5.28E-04	-7.12E-08	3.57E+00	4.81E-04	9.73E-02	1.31E-05	-7.06E-02	-9.52E-06	-1.09E-02	-1.47E-06
	7380.1	2.28E-04	3.09E-08	2.92E+00	3.96E-04	8.04E-02	1.09E-05	-4.00E-02	-5.42E-06	6.43E-03	8.71E-07
	6573.37	8.06E-02	1.23E-05	-4.06E+00	-6.18E-04	5.72E-01	8.70E-05	-2.38E-01	-3.62E-05	1.68E-01	2.56E-05
	7939.03	-3.87E-03	-4.87E-07	6.51E-01	8.20E-05	6.30E-02	7.94E-06	8.55E-02	1.08E-05	-3.07E-02	-3.87E-06
SEC	7313.58	-3.04E-04	-4.16E-08	4.85E+00	6.63E-04	3.91E-03	5.35E-07	9.81E-02	1.34E-05	-2.85E-03	-3.90E-07

Location	Volume (m ³)	Bq/sample	Bq/m ³	Bq/sample	Bq/m ³	Bq/sample	Bq/m ³	Bq/sample	Bq/m ³	Bq/sample	Bq/m ³
	7263.21	1.18E-04	1.62E-08	4.34E+00	5.98E-04	2.43E-02	3.35E-06	-5.16E-02	-7.10E-06	1.51E-03	2.08E-07
	7437.45	-1.56E-02	-2.10E-06	-1.37E+00	-1.84E-04	1.17E-01	1.57E-05	-7.34E-02	-9.87E-06	5.63E-02	7.57E-06
	8053.24	-5.53E-03	-6.87E-07	-1.47E+00	-1.83E-04	7.93E-02	9.85E-06	-1.99E-01	-2.47E-05	1.12E-02	1.39E-06
CBD	7545.93	-1.68E-04	-2.23E-08	2.18E+00	2.89E-04	5.95E-02	7.89E-06	3.33E-02	4.41E-06	-2.62E-03	-3.47E-07
	7433.64	2.76E-04	3.71E-08	-1.93E+00	-2.60E-04	1.18E-01	1.59E-05	-1.81E-02	-2.43E-06	5.36E-03	7.21E-07
	7447.74	-2.36E-02	-3.17E-06	1.36E+00	1.83E-04	7.19E-01	9.65E-05	-5.44E-02	-7.30E-06	-3.85E-02	-5.17E-06
	7892.42	1.10E-02	1.39E-06	-2.06E+00	-2.61E-04	8.43E-02	1.07E-05	9.81E-02	1.24E-05	1.17E-01	1.48E-05
SMR	7257.13	-9.09E-05	-1.25E-08	3.64E+00	5.02E-04	-7.91E-02	-1.09E-05	-5.48E-02	-7.55E-06	4.18E-03	5.76E-07
	7330.54	-1.42E-04	-1.94E-08	2.90E+00	3.96E-04	-1.57E-02	-2.14E-06	-1.83E-02	-2.50E-06	1.51E-02	2.06E-06
	6066.22	-5.98E-03	-9.86E-07	6.73E-01	1.11E-04	1.57E+00	2.59E-04	7.63E-03	1.26E-06	4.31E-02	7.10E-06
	7919.99	8.62E-04	1.09E-07	-3.68E+00	-4.65E-04	9.24E-02	1.17E-05	-1.57E-01	-1.98E-05	-1.02E-01	-1.29E-05
SOO	7332.91	-9.28E-05	-1.27E-08	5.39E+00	7.35E-04	5.69E-02	7.76E-06	-1.22E-03	-1.66E-07	-4.20E-03	-5.73E-07
	7268.43	1.26E-04	1.73E-08	3.22E+00	4.43E-04	5.72E-02	7.87E-06	2.57E-02	3.54E-06	7.79E-03	1.07E-06
	7051.16	-2.15E-03	-3.05E-07	-5.85E-01	-8.30E-05	-7.17E-02	-1.02E-05	-2.02E-02	-2.86E-06	1.53E-01	2.17E-05
	7603.82	-1.81E-02	-2.38E-06	2.37E+00	3.12E-04	7.08E+00	9.31E-04	1.33E-01	1.75E-05	3.38E-02	4.45E-06
Mean^b	7270.46	-1.27E-03	-1.30E-07	9.31E-01	1.30E-04	3.51E-01	4.86E-05	-2.36E-02	-3.28E-06	4.06E-03	7.46E-07
Minimum	4682.47	-2.65E-02	-3.63E-06	-4.06E+00	-6.18E-04	-1.91E-01	-2.62E-05	-2.38E-01	-3.62E-05	-1.33E-01	-1.83E-05
Maximum	8053.24	8.06E-02	1.23E-05	5.39E+00	7.35E-04	7.08E+00	9.31E-04	1.33E-01	1.82E-05	1.68E-01	2.56E-05

Note. See appendix B for sampling location codes.

- Samples were composited on a quarterly basis. The mean was calculated for samples from WFF in Quarter 1, WEE in Quarter 2, WSS in Quarter 3, and CBD in Quarter 4.
- Non-relational values are presented for the mean. In all other cases, Volume, Bq/sample, and Bq/m³ are presented as a data set.

Table F.6 – Round 47 Radionuclide Activity in Primary Groundwater from Detection Monitoring Program Wells on the WIPP Site*(Refer to the end of the table for notes)*

Location	Sample Date	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ¹	2 σ TPU ²	MDC ³	Q ⁴	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d
		^{233/234}U				²³⁵U				²³⁸U			
WQSP-1	3/11/2025	1.35E+00	3.72E-01	1.41E-03	=	4.00E-02	1.23E-02	9.19E-04	=	2.22E-01	6.23E-02	1.13E-03	=
WQSP-2	3/18/2025	1.06E+00	2.53E-01	1.40E-03	=	1.94E-02	5.94E-03	9.50E-04	=	1.68E-01	4.13E-02	1.15E-03	=
WQSP-3	4/8/2025	1.65E-01	3.79E-02	1.36E-03	=	4.45E-03	1.93E-03	8.78E-04	=	2.32E-02	6.17E-03	1.01E-03	=
WQSP-4	5/20/2025	5.71E-01	9.33E-02	1.54E-03	UJ ^e	1.37E-02	3.65E-03	9.23E-04	UJ ^e	1.05E-01	1.83E-02	1.39E-03	UJ ^e
WQSP-5	5/13/2025	5.34E-01	7.96E-02	1.53E-03	UJ ^e	5.98E-03	2.06E-03	7.43E-04	UJ ^e	7.87E-02	1.30E-02	1.35E-03	UJ ^e
WQSP-6	4/15/2025	4.18E-01	9.13E-02	1.34E-03	=	7.14E-03	2.57E-03	7.65E-04	=	5.52E-02	1.30E-02	9.83E-04	=
		²³⁸Pu				^{239/240}Pu				²⁴¹Am			
WQSP-1	3/11/2025	-3.87E-05	3.83E-04	9.02E-04	U	-1.24E-04	2.49E-04	7.94E-04	U	6.23E-05	3.87E-04	8.82E-04	U
WQSP-2	3/18/2025	1.90E-04	3.51E-04	6.12E-04	U	6.19E-05	2.76E-04	6.12E-04	U	1.37E-04	4.39E-04	1.03E-03	U
WQSP-3	4/8/2025	4.19E-05	2.86E-04	6.91E-04	U	-8.76E-05	1.96E-04	7.24E-04	U	5.97E-04	5.95E-04	7.78E-04	U
WQSP-4	5/20/2025	6.87E-05	2.66E-04	6.07E-04	U	4.19E-05	2.86E-04	6.44E-04	U	3.19E-04	4.78E-04	7.62E-04	U
WQSP-5	5/13/2025	-5.43E-05	1.56E-04	6.18E-04	U	-5.03E-05	1.50E-04	6.09E-04	U	3.36E-04	4.61E-04	7.02E-04	U
WQSP-6	4/15/2025	3.66E-05	3.54E-04	7.65E-04	U	-8.68E-05	2.14E-04	7.17E-04	U	7.11E-04	6.63E-04	7.98E-04	U
		⁴⁰K				⁶⁰Co				¹³⁷Cs			
WQSP-1	3/11/2025	1.30E+01	9.12E+00	1.42E+01	U	1.12E+00	1.39E+00	1.65E+00	U	-5.54E-02	1.09E+00	1.34E+00	U
WQSP-2	3/18/2025	1.49E+01	3.27E+00	3.97E+00	=	8.89E-03	1.49E-01	2.83E-01	U	1.34E-02	1.60E-01	2.92E-01	U
WQSP-3	4/8/2025	4.62E+01	1.27E+01	1.55E+01	=	2.01E-01	1.60E+00	1.82E+00	U	-8.76E-01	1.20E+00	1.32E+00	U
WQSP-4	5/20/2025	2.46E+01	3.87E+00	3.95E+00	=	3.81E-02	1.77E-01	2.99E-01	U	-2.92E-01	1.69E-01	2.63E-01	U
WQSP-5	5/13/2025	1.32E+01	2.72E+00	2.79E+00	=	-2.77E-02	1.36E-01	2.24E-01	U	-5.67E-02	1.12E-01	1.99E-01	U
WQSP-6	4/15/2025	6.43E+00	1.38E+01	1.73E+01	U	2.60E-02	1.36E+00	1.53E+00	U	7.08E-01	9.35E-01	1.32E+00	U

Location	Sample Date	⁹⁰ Sr			
		[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d
WQSP-1	3/11/2025	-1.72E-03	1.82E-02	1.35E-02	U
WQSP-2	3/18/2025	-8.69E-03	1.82E-02	1.35E-02	U
WQSP-3	4/8/2025	-3.82E-03	1.90E-02	1.31E-02	U
WQSP-4	5/20/2025	8.49E-04	1.48E-02	1.16E-02	U
WQSP-5	5/13/2025	-1.33E-03	1.45E-02	1.15E-02	U
WQSP-6	4/15/2025	-1.85E-02	1.93E-02	1.33E-02	U

Notes: Units are Bq/L.

- Radionuclide activity. Only radionuclides with activities greater than 2 σ TPU and the MDC are considered detections. Samples may have a negative value when background radioactivity is subtracted.
- Total propagated uncertainty.
- Minimum detectable concentration.
- Qualifier. Indicates whether radionuclide was detected. Equal sign (=) denotes detected. U denotes undetected. UJ denotes a nuclide that was not detected above the reported MDC and 2 sigma counting uncertainty and a quality deficiency affected the data making the reported data more uncertain.
- These qualifier assignments are suspected to be in error, with the correct assignments being "NJ," or "Nuclide present at an estimated quantity." A revised laboratory report was not available at the time of publication.

Table F.7 – Uranium Isotopes Activity in Surface Water Samples Collected Near the WIPP Site

Location	Sampling Date	^{233/234} U				²³⁵ U				²³⁸ U			
		[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d
HIL	5/12/2025	1.67E-02	3.88E-03	1.24E-03	=	6.19E-04	6.69E-04	8.51E-04	U	1.39E-02	3.40E-03	1.18E-03	=
NOY	5/12/2025	1.45E-02	3.79E-03	1.26E-03	=	1.06E-03	9.14E-04	8.70E-04	=	1.41E-02	3.72E-03	1.17E-03	=
IDN	5/19/2025	7.36E-03	2.43E-03	1.16E-03	=	8.37E-05	4.36E-04	1.03E-03	U	7.58E-03	2.48E-03	1.12E-03	=
RLK	5/19/2025	3.18E-02	8.47E-03	1.28E-03	=	1.32E-03	1.16E-03	1.08E-03	=	2.96E-02	7.98E-03	1.24E-03	=
LST	5/15/2025	1.33E-02	3.51E-03	1.26E-03	=	1.22E-03	9.44E-04	7.98E-04	=	1.40E-02	3.65E-03	1.13E-03	=
PCN	5/12/2025	1.98E-01	3.28E-02	1.25E-03	=	3.39E-03	1.61E-03	8.71E-04	=	9.02E-02	1.58E-02	1.12E-03	=
RED	5/15/2025	1.41E-02	3.83E-03	1.30E-03	=	1.06E-03	9.16E-04	8.59E-04	=	1.25E-02	3.52E-03	1.13E-03	=
CBD	5/1/2025	1.04E-01	1.80E-02	1.21E-03	=	2.10E-03	1.21E-03	8.10E-04	=	4.76E-02	8.99E-03	1.14E-03	=
BRA	5/1/2025	1.38E-01	2.21E-02	1.20E-03	=	5.03E-03	1.89E-03	7.98E-04	=	6.62E-02	1.13E-02	1.11E-03	=
COY ^e	5/15/2025	1.55E-02	4.31E-03	1.35E-03	=	1.62E-04	4.36E-04	9.29E-04	U	1.04E-02	3.24E-03	1.26E-03	=
UPR	5/1/2025	1.99E-01	7.43E-02	1.95E-03	=	6.53E-03	3.98E-03	1.80E-03	=	1.53E-01	5.77E-02	1.81E-03	=
FWT	5/15/2025	6.75E-02	1.33E-02	1.31E-03	=	1.88E-03	1.24E-03	1.06E-03	=	2.43E-02	5.62E-03	1.16E-03	=
SWL ^f	5/22/2025	1.95E-02	4.78E-03	1.20E-03	=	6.84E-04	7.51E-04	9.60E-04	U	7.34E-03	2.42E-03	1.14E-03	=
BHT	5/15/2025	9.37E-03	2.58E-03	1.25E-03	=	7.16E-04	7.04E-04	7.76E-04	U	8.25E-03	2.37E-03	1.07E-03	=
PKT	5/19/2025	3.01E-02	9.21E-03	1.43E-03	=	1.25E-03	1.23E-03	1.24E-03	=	2.97E-02	9.10E-03	1.46E-03	=

Note. See appendix B for sampling location codes. Units are Bq/L.

- Radionuclide activity. Only radionuclides with activities greater than 2 σ TPU and the MDC are considered detections. Samples may have a negative value when background radioactivity is subtracted.
- Total propagated uncertainty.
- Minimum detectable concentration.
- Qualifier. Indicates whether radionuclide was detected. Equal sign (=) denotes detected. U denotes undetected.
- Semi-blind field duplicate.
- Surface water composite consisting of Settling Lagoons 1 and 2, Effluent Lagoons A, B, and C, and Polishing Lagoons 1 and 2, as available.

Table F.8 – Plutonium and Americium Activity in Surface Water Samples Collected Near the WIPP Site

Location	Sample Date	²³⁸ Pu				^{239/240} Pu				²⁴¹ Am			
		[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d
HIL	5/12/2025	3.68E-05	5.87E-04	1.31E-03	U	2.79E-04	7.18E-04	1.28E-03	U	7.48E-04	8.65E-04	1.08E-03	U
NOY	5/12/2025	1.99E-04	4.24E-04	7.10E-04	U	3.33E-04	5.01E-04	7.36E-04	U	7.90E-05	3.27E-04	7.86E-04	U
IDN	5/19/2025	-4.72E-05	1.46E-04	6.57E-04	U	3.53E-05	3.01E-04	7.29E-04	U	2.20E-04	3.96E-04	7.23E-04	U
RLK	5/19/2025	-6.71E-05	1.80E-04	6.45E-04	U	-5.85E-05	1.68E-04	7.06E-04	U	3.23E-04	4.13E-04	6.69E-04	U
LST	5/15/2025	-4.56E-05	1.41E-04	5.73E-04	U	-6.44E-05	1.68E-04	6.48E-04	U	5.18E-05	5.02E-04	1.36E-03	U
PCN	5/12/2025	-7.31E-05	1.85E-04	6.44E-04	U	1.54E-04	3.94E-04	6.58E-04	U	1.76E-04	4.65E-04	9.25E-04	U
RED	5/15/2025	-6.92E-05	1.86E-04	6.83E-04	U	7.77E-05	3.00E-04	6.70E-04	U	1.88E-04	3.68E-04	7.14E-04	U
CBD	5/1/2025	-6.69E-05	1.80E-04	6.81E-04	U	3.00E-04	4.68E-04	7.34E-04	U	4.19E-05	3.18E-04	7.68E-04	U
BRA	5/1/2025	-4.94E-05	1.47E-04	5.93E-04	U	-7.20E-05	1.78E-04	6.59E-04	U	3.16E-04	4.82E-04	7.31E-04	U
COY ^e	5/15/2025	-5.56E-05	1.60E-04	5.97E-04	U	-5.54E-05	1.59E-04	6.08E-04	U	2.77E-04	4.22E-04	6.87E-04	U
UPR	5/1/2025	1.04E-03	1.42E-03	2.01E-03	U	-1.49E-04	4.31E-04	1.86E-03	U	4.72E-04	5.36E-04	7.28E-04	U
FWT	5/15/2025	-4.41E-05	1.43E-04	6.16E-04	U	4.00E-05	3.04E-04	7.03E-04	U	1.99E-04	3.79E-04	7.02E-04	U
SWL ^f	5/22/2025	-8.09E-05	1.85E-04	6.10E-04	U	-5.13E-05	1.47E-04	5.87E-04	U	2.85E-04	4.51E-04	7.37E-04	U
BHT	5/15/2025	-8.76E-05	2.01E-04	6.55E-04	U	-5.56E-05	1.60E-04	6.27E-04	U	3.80E-05	2.89E-04	7.55E-04	U
PKT	5/19/2025	-5.84E-05	1.81E-04	7.08E-04	U	2.09E-04	4.58E-04	8.05E-04	U	2.96E-04	4.51E-04	7.83E-04	U

Note. See appendix B for sampling location codes. Units are Bq/L.

- Radionuclide activity. Only radionuclides with activities greater than 2 σ TPU and the MDC are considered detections. Samples may have a negative value when background radioactivity is subtracted.
- Total propagated uncertainty.
- Minimum detectable concentration.
- Qualifier. Indicates whether radionuclide was detected. U denotes undetected.
- Semi-blind field duplicate.
- Surface water composite consisting of Settling Lagoons 1 and 2, Effluent Lagoons A, B, and C, and Polishing Lagoons 1 and 2, as available.

Table F.9 – Gamma Radionuclides and ^{90}Sr Activity in Surface Water Samples Collected Near the WIPP Site*(Refer to the end of the table for notes)*

Location	Sample Date	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d
		^{40}K				^{60}Co			
HIL	5/12/2025	1.72E+01	1.47E+01	2.02E+01	U	1.44E-01	1.69E+00	1.73E+00	U
NOY	5/12/2025	1.18E+00	6.66E+00	1.18E+01	U	3.32E-01	9.33E-01	1.10E+00	U
IDN	5/19/2025	1.23E+00	1.60E+00	3.22E+00	U	-3.06E-02	1.23E-01	2.27E-01	U
RLK	5/19/2025	1.27E+01	1.19E+01	1.70E+01	U	-3.97E-01	1.56E+00	1.47E+00	U
LST	5/15/2025	3.03E+00	1.71E+00	3.61E+00	U	-3.13E-02	1.34E-01	2.30E-01	U
PCN	5/12/2025	2.23E+00	1.64E+00	3.40E+00	U	9.03E-02	1.10E-01	2.11E-01	U
RED	5/15/2025	3.76E+00	1.52E+01	1.69E+01	U	1.37E+00	1.09E+00	1.59E+00	U
CBD	5/1/2025	-2.61E-02	1.82E+01	1.84E+01	U	5.74E-01	1.57E+00	1.76E+00	U
BRA	5/1/2025	3.61E+00	7.14E+00	1.23E+01	U	-1.11E+00	1.25E+00	1.07E+00	U
COY ^e	5/15/2025	2.20E+00	1.39E+00	2.98E+00	U	6.08E-02	9.62E-02	1.97E-01	U
UPR	5/1/2025	1.97E+00	2.31E+00	3.86E+00	U	-5.07E-02	1.26E-01	1.76E-01	U
FWT	5/15/2025	3.96E+00	1.91E+00	4.04E+00	U	4.42E-02	1.23E-01	1.69E-01	U
SWL ^f	5/22/2025	1.82E+01	3.70E+00	4.56E+00	=	-4.07E-02	1.51E-01	2.27E-01	U
BHT	5/15/2025	2.39E+01	1.30E+01	2.06E+01	=	-1.01E+00	1.84E+00	1.64E+00	U
PKT	5/19/2025	3.72E+00	1.77E+00	3.85E+00	U	1.05E-01	1.29E-01	2.13E-01	U

Location	Sample Date	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d
		¹³⁷ Cs				⁹⁰ Sr			
HIL	5/12/2025	5.98E-01	1.28E+00	1.52E+00	U	-1.07E-02	1.85E-02	1.24E-02	U
NOY	5/12/2025	4.24E-02	9.18E-01	1.06E+00	U	-5.59E-03	2.06E-02	1.27E-02	U
IDN	5/19/2025	-8.92E-02	1.11E-01	1.90E-01	U	3.72E-03	1.68E-02	1.23E-02	U
RLK	5/19/2025	-9.73E-01	1.52E+00	1.53E+00	U	4.18E-03	1.68E-02	1.23E-02	U
LST	5/15/2025	-5.18E-02	1.26E-01	2.10E-01	U	-2.30E-03	1.70E-02	1.25E-02	U
PCN	5/12/2025	1.12E-01	1.10E-01	2.19E-01	U	1.25E-04	2.05E-02	1.27E-02	U
RED	5/15/2025	6.72E-01	1.08E+00	1.39E+00	U	-8.48E-03	1.65E-02	1.25E-02	U
CBD	5/1/2025	-3.28E-01	1.31E+00	1.43E+00	U	7.80E-03	2.11E-02	1.27E-02	U
BRA	5/1/2025	6.39E-01	8.51E-01	1.09E+00	U	2.67E-03	1.99E-02	1.26E-02	U
COY ^e	5/15/2025	1.31E-02	1.20E-01	2.16E-01	U	1.27E-03	1.66E-02	1.24E-02	U
UPR	5/1/2025	7.19E-02	1.10E-01	2.12E-01	U	-3.60E-03	2.33E-02	1.32E-02	U
FWT	5/15/2025	-1.48E-02	1.39E-01	2.43E-01	U	-1.78E-03	1.67E-02	1.25E-02	U
SWL ^f	5/22/2025	-1.04E-01	1.15E-01	1.95E-01	U	3.80E-03	1.64E-02	1.22E-02	U
BHT	5/15/2025	4.45E-01	1.15E+00	1.40E+00	U	-6.60E-03	1.67E-02	1.26E-02	U
PKT	5/19/2025	5.32E-02	1.46E-01	2.59E-01	U	9.23E-03	1.69E-02	1.22E-02	U

Note. See appendix B for sampling location codes. Units are Bq/L.

- Radionuclide activity. Only radionuclides with activities greater than 2 σ TPU and the MDC are considered detections. Samples may have a negative value when background radioactivity is subtracted.
- Total propagated uncertainty.
- Minimum detectable concentration.
- Qualifier. Indicates whether radionuclide was detected. Equal sign (=) denotes detected. U denotes undetected.
- Semi-blind field duplicate.
- Surface water composite consisting of Settling Lagoons 1 and 2, Effluent Lagoons A, B, and C, and Polishing Lagoons 1 and 2, as available.

Table F.10 – Uranium Activity in Sediment Samples Collected Near the WIPP Site

Location	Sample Date	^{233/234} U				²³⁵ U				²³⁸ U			
		[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d
HIL	5/12/2025	1.95E-02	3.13E-02	1.03E-03	U	1.17E-03	1.97E-03	5.69E-04	U	2.10E-02	3.36E-02	8.89E-04	U
HIL Dup	5/12/2025	1.95E-02	3.34E-02	1.05E-03	U	8.40E-04	1.55E-03	6.02E-04	U	1.91E-02	3.27E-02	9.27E-04	U
UPR	5/1/2025	1.45E-02	2.58E-02	1.04E-03	U	1.40E-03	2.60E-03	5.74E-04	U	1.52E-02	2.71E-02	8.95E-04	U
BRA	5/1/2025	2.33E-02	3.48E-02	1.00E-03	U	7.41E-04	1.21E-03	5.31E-04	U	1.91E-02	2.86E-02	8.52E-04	U
CBD	5/1/2025	1.37E-02	2.15E-02	1.02E-03	U	5.74E-04	1.01E-03	5.63E-04	U	1.39E-02	2.19E-02	8.84E-04	U
PCN	5/12/2025	2.38E-02	3.96E-02	1.02E-03	U	5.22E-04	9.71E-04	5.66E-04	U	2.03E-02	3.38E-02	8.96E-04	U
NOY	5/12/2025	1.01E-02	1.55E-02	1.02E-03	U	5.75E-04	9.86E-04	5.63E-04	U	1.26E-02	1.92E-02	8.72E-04	U
LST	5/15/2025	1.74E-02	4.12E-02	1.24E-03	U	1.31E-03	3.19E-03	7.62E-04	U	1.74E-02	4.10E-02	9.71E-04	U
BHT	5/15/2025	1.86E-02	5.76E-02	1.81E-03	U	1.24E-04	5.37E-04	1.08E-03	U	1.60E-02	4.97E-02	1.85E-03	U
RED	5/15/2025	1.29E-02	2.09E-02	1.02E-03	U	6.38E-04	1.13E-03	5.50E-04	U	1.53E-02	2.46E-02	8.89E-04	U
RLK	5/15/2025	1.85E-02	7.98E-02	1.39E-03	U	1.36E-03	5.95E-03	1.11E-03	U	2.01E-02	8.66E-02	1.35E-03	U
IDN	5/15/2025	1.70E-02	4.61E-02	1.31E-03	U	1.73E-03	4.78E-03	7.45E-04	U	1.65E-02	4.47E-02	1.03E-03	U
PKT	5/15/2025	2.41E-02	8.82E-02	1.41E-03	U	1.47E-03	5.49E-03	9.61E-04	U	2.55E-02	9.34E-02	1.16E-03	U

Note. See appendix B for sampling location codes. Units are in becquerels per gram (Bq/g), dry weight.

- Radionuclide activity. Only radionuclides with activities greater than 2 σ TPU and the MDC are considered detections. Samples may have a negative value when background radioactivity is subtracted.
- Total propagated uncertainty.
- Minimum detectable concentration.
- Qualifier. Indicates whether radionuclide was detected. Equal sign (=) denotes detected. U denotes undetected.

Table F.11 – Plutonium and Americium Activity in Sediment Samples Collected Near the WIPP Site

Location	Sample Date	²³⁸ Pu				^{239/240} Pu				²⁴¹ Am			
		[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d
HIL	5/12/2025	3.03E-04	3.01E-04	3.89E-04	U	3.53E-04	3.33E-04	4.03E-04	U	2.37E-04	2.62E-04	4.49E-04	U
HIL Dup	5/12/2025	4.04E-04	3.74E-04	4.33E-04	U	1.12E-04	2.27E-04	4.19E-04	U	2.86E-04	3.48E-04	5.40E-04	U
UPR	5/1/2025	2.45E-04	3.10E-04	4.09E-04	U	7.27E-06	1.96E-04	5.57E-04	U	2.83E-04	2.88E-04	4.62E-04	U
BRA	5/1/2025	1.85E-04	2.68E-04	4.29E-04	U	2.56E-04	2.90E-04	4.18E-04	U	2.08E-04	2.55E-04	4.54E-04	U
CBD	5/1/2025	9.59E-05	1.88E-04	3.64E-04	U	1.83E-05	1.56E-04	4.49E-04	U	8.10E-05	2.14E-04	5.00E-04	U
PCN	5/12/2025	3.79E-04	3.41E-04	3.90E-04	U	3.60E-05	1.61E-04	4.12E-04	U	8.19E-05	1.91E-04	4.69E-04	U
NOY	5/12/2025	2.97E-04	2.94E-04	3.66E-04	U	2.56E-05	1.59E-04	3.96E-04	U	8.82E-06	1.77E-04	5.02E-04	U
LST	5/15/2025	1.58E-04	2.38E-04	3.85E-04	U	2.01E-04	2.79E-04	4.48E-04	U	2.75E-05	1.43E-04	4.68E-04	U
BHT	5/15/2025	3.63E-05	1.40E-04	3.69E-04	U	-4.43E-05	1.02E-04	4.19E-04	U	1.53E-04	2.37E-04	4.91E-04	U
RED	5/15/2025	1.60E-04	2.49E-04	4.01E-04	U	1.07E-04	2.03E-04	3.99E-04	U	1.44E-04	2.36E-04	4.68E-04	U
RLK	5/15/2025	-2.99E-05	8.30E-05	3.73E-04	U	9.16E-05	1.84E-04	3.81E-04	U	3.02E-05	1.71E-04	4.99E-04	U
IDN	5/15/2025	-2.70E-05	7.77E-05	3.59E-04	U	3.26E-04	2.90E-04	3.60E-04	U	3.33E-04	3.05E-04	4.87E-04	U
PKT	5/15/2025	7.88E-05	1.78E-04	3.63E-04	U	2.60E-04	2.58E-04	3.60E-04	U	1.93E-04	2.70E-04	5.17E-04	U

Note. See appendix B for sampling location codes. Units are in Bq/g, dry weight.

- Radionuclide activity. Only radionuclides with activities greater than 2 σ TPU and the MDC are considered detections. Samples may have a negative value when background radioactivity is subtracted.
- Total propagated uncertainty.
- Minimum detectable concentration.
- Qualifier. Indicates whether radionuclide was detected. U denotes undetected.

Table F.12 – Gamma Radionuclides and ⁹⁰Sr Activity in Sediment Samples Collected Near the WIPP Site*(Refer to the end of the table for notes)*

Location	Sample Date	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d
		⁴⁰ K				⁶⁰ Co			
HIL	5/12/2025	8.38E-01	4.50E-02	2.13E-02	=	-5.43E-04	8.19E-04	1.43E-03	U
HIL Dup	5/12/2025	8.71E-01	4.72E-02	2.20E-02	=	3.10E-04	8.51E-04	1.64E-03	U
UPR	5/1/2025	2.28E-01	2.71E-02	1.78E-02	=	-1.11E-04	7.90E-04	1.53E-03	U
BRA	5/1/2025	4.36E-01	3.21E-02	1.96E-02	=	2.98E-05	7.30E-04	1.32E-03	U
CBD	5/1/2025	2.18E-01	2.16E-02	1.83E-02	=	3.16E-04	6.10E-04	1.07E-03	U
PCN	5/12/2025	4.97E-01	3.14E-02	1.54E-02	=	2.41E-04	6.27E-04	1.19E-03	U
NOY	5/12/2025	4.49E-01	3.02E-02	1.83E-02	=	-6.86E-05	6.17E-04	1.15E-03	U
LST	5/15/2025	3.97E-01	3.59E-02	1.78E-02	=	2.05E-04	8.75E-04	1.77E-03	U
BHT	5/15/2025	5.03E-01	3.29E-02	1.74E-02	=	-8.63E-04	7.17E-04	1.08E-03	U
RED	5/15/2025	3.25E-01	2.67E-02	1.93E-02	=	-7.70E-04	7.06E-04	1.13E-03	U
RLK	5/15/2025	6.98E-01	4.27E-02	2.45E-02	=	1.22E-04	7.97E-04	1.52E-03	U
IDN	5/15/2025	3.72E-01	2.87E-02	2.11E-02	=	-1.23E-04	6.74E-04	1.23E-03	U
PKT	5/15/2025	6.60E-01	4.29E-02	2.47E-02	=	2.99E-04	8.51E-04	1.50E-03	U

Location	Sample Date	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d
		¹³⁷ Cs				⁹⁰ Sr			
HIL	5/12/2025	4.75E-03	1.08E-03	1.45E-03	=	2.66E-03	8.82E-03	1.15E-02	U
HIL Dup	5/12/2025	4.42E-03	1.31E-03	1.92E-03	=	-1.83E-03	8.93E-03	1.16E-02	U
UPR	5/1/2025	3.42E-04	6.55E-04	1.31E-03	U	-2.12E-03	8.56E-03	1.15E-02	U
BRA	5/1/2025	2.62E-04	7.88E-04	1.40E-03	U	-7.34E-04	8.17E-03	1.15E-02	U
CBD	5/1/2025	1.01E-04	4.57E-04	8.11E-04	U	-2.84E-03	8.54E-03	1.15E-02	U
PCN	5/12/2025	5.61E-04	6.76E-04	1.21E-03	U	-1.53E-03	9.38E-03	1.16E-02	U
NOY	5/12/2025	1.03E-03	7.29E-04	1.38E-03	U	-5.65E-03	9.56E-03	1.17E-02	U
LST	5/15/2025	1.18E-03	8.00E-04	1.66E-03	U	-1.39E-03	1.09E-02	1.16E-02	U
BHT	5/15/2025	2.66E-03	1.05E-03	1.59E-03	=	-1.14E-03	1.09E-02	1.16E-02	U
RED	5/15/2025	2.03E-03	1.00E-03	1.56E-03	=	-3.24E-03	8.28E-03	1.15E-02	U
RLK	5/15/2025	7.97E-04	9.35E-04	1.71E-03	U	5.91E-03	1.14E-02	1.16E-02	U
IDN	5/15/2025	1.25E-03	9.18E-04	1.49E-03	U	1.65E-03	1.11E-02	1.16E-02	U
PKT	5/15/2025	9.37E-03	1.77E-03	2.36E-03	=	0.00E+00	1.13E-02	1.16E-02	U

Note. See appendix B for sampling location codes. Units are in Bq/g, dry weight.

- Radionuclide activity. Only radionuclides with activities greater than 2 σ TPU and the MDC are considered detections. Samples may have a negative value when background radioactivity is subtracted.
- Total propagated uncertainty.
- Minimum detectable concentration.
- Qualifier. Indicates whether radionuclide was detected. Equal sign (=) denotes detected. U denotes undetected.

Table F.13 – Uranium Activity in Soil Samples Collected on and Near the WIPP Site

Location	Depth (cm)	Sample Date	^{233/234} U				²³⁵ U				²³⁸ U			
			[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d
WFF	0–2	3/6/2025	5.62E-03	1.01E-02	1.14E-03	U	6.11E-04	1.19E-03	6.27E-04	U	6.19E-03	1.11E-02	8.28E-04	U
WFF	2–5	3/6/2025	6.10E-03	1.05E-02	1.11E-03	U	3.02E-04	6.23E-04	5.98E-04	U	5.26E-03	9.10E-03	8.13E-04	U
WFF	5–10	3/6/2025	6.34E-03	9.42E-03	1.10E-03	U	2.17E-04	4.28E-04	5.68E-04	U	6.52E-03	9.67E-03	8.22E-04	U
MLR	0–2	4/3/2025	1.91E-02	3.40E-02	1.12E-03	U	1.00E-03	1.88E-03	6.14E-04	U	1.64E-02	2.91E-02	8.42E-04	U
MLR	2–5	4/3/2025	1.64E-02	2.59E-02	1.08E-03	U	8.20E-04	1.39E-03	5.49E-04	U	1.51E-02	2.39E-02	8.07E-04	U
MLR	5–10	4/3/2025	1.64E-02	2.80E-02	1.11E-03	U	5.98E-04	1.13E-03	5.87E-04	U	1.51E-02	2.58E-02	8.22E-04	U
WEE	0–2	3/6/2025	5.35E-03	1.55E-03	1.06E-03	=	7.17E-04	4.85E-04	5.57E-04	=	5.68E-03	1.62E-03	7.89E-04	=
WEE	2–5	3/6/2025	8.83E-03	2.56E-03	1.08E-03	=	4.05E-04	3.75E-04	5.51E-04	U	7.13E-03	2.15E-03	8.04E-04	=
WEE	5–10	3/6/2025	7.18E-03	2.08E-03	1.06E-03	=	4.38E-04	3.85E-04	5.51E-04	U	6.66E-03	1.96E-03	7.90E-04	=
SMR	0–2	4/3/2025	1.08E-02	1.86E-02	1.10E-03	U	5.89E-04	1.11E-03	5.77E-04	U	1.15E-02	1.97E-02	8.14E-04	U
SMR	2–5	4/3/2025	1.20E-02	2.01E-02	1.11E-03	U	3.11E-04	6.47E-04	6.53E-04	U	1.11E-02	1.87E-02	8.34E-04	U
SMR	5–10	4/3/2025	1.09E-02	1.69E-02	1.09E-03	U	1.07E-03	1.75E-03	5.70E-04	U	1.37E-02	2.12E-02	8.17E-04	U
SEC	0–2	4/3/2025	1.32E-02	2.29E-02	1.12E-03	U	6.15E-04	1.18E-03	6.19E-04	U	1.35E-02	2.34E-02	8.37E-04	U
SEC	2–5	4/3/2025	1.10E-02	2.09E-02	1.14E-03	U	4.78E-04	1.02E-03	6.31E-04	U	1.17E-02	2.22E-02	8.57E-04	U
SEC	5–10	4/3/2025	6.97E-03	1.27E-02	1.13E-03	U	6.47E-05	2.49E-04	6.22E-04	U	6.95E-03	1.27E-02	8.32E-04	U
WSS	0–2	3/6/2025	6.04E-03	8.35E-03	1.08E-03	U	2.66E-04	4.77E-04	5.58E-04	U	5.76E-03	7.97E-03	7.87E-04	U
WSS	2–5	3/6/2025	7.50E-03	1.25E-02	1.13E-03	U	6.29E-04	1.15E-03	5.90E-04	U	6.21E-03	1.04E-02	8.36E-04	U
WSS	5–10	3/6/2025	6.19E-03	1.01E-02	1.11E-03	U	4.10E-04	7.68E-04	5.80E-04	U	5.55E-03	9.10E-03	8.24E-04	U
WSS Dup	0–2	3/6/2025	5.46E-03	1.59E-03	1.04E-03	=	5.95E-04	4.32E-04	5.42E-04	=	5.82E-03	1.67E-03	7.69E-04	=
WSS Dup	2–5	3/6/2025	6.97E-03	1.99E-03	1.06E-03	=	1.20E-04	2.35E-04	5.65E-04	U	6.81E-03	1.95E-03	7.89E-04	=
WSS Dup	5–10	3/6/2025	6.85E-03	2.08E-03	1.21E-03	=	4.71E-04	4.21E-04	6.43E-04	U	6.89E-03	2.09E-03	1.07E-03	=

Note. See appendix B for sampling location codes. Units are in Bq/g, dry weight.

- Radionuclide activity. Only radionuclides with activities greater than 2 σ TPU and the MDC are considered detections. Samples may have a negative value when background radioactivity is subtracted.
- Total propagated uncertainty.
- Minimum detectable concentration.
- Qualifier. Indicates whether radionuclide was detected. Equal sign (=) denotes detected. U denotes undetected.

Table F.14 – Plutonium and Americium Activity in Soil Samples Collected on and Near the WIPP Site

Location	Depth (cm)	Sample Date	²³⁸ Pu				^{239/240} Pu				²⁴¹ Am			
			[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d
WFF	0–2	3/6/2025	-2.69E-05	8.03E-05	4.14E-04	U	3.31E-05	1.47E-04	3.76E-04	U	8.00E-05	1.86E-04	5.02E-04	U
WFF	2–5	3/6/2025	-3.47E-05	8.55E-05	3.84E-04	U	2.95E-04	2.78E-04	3.68E-04	U	2.20E-05	1.50E-04	5.07E-04	U
WFF	5–10	3/6/2025	-3.99E-05	9.60E-05	4.09E-04	U	4.19E-05	1.34E-04	3.63E-04	U	-2.65E-05	7.89E-05	5.04E-04	U
MLR	0–2	4/3/2025	-1.59E-05	6.05E-05	3.68E-04	U	3.14E-04	3.06E-04	4.03E-04	U	1.70E-04	2.42E-04	5.17E-04	U
MLR	2–5	4/3/2025	-3.96E-05	9.77E-05	4.07E-04	U	1.44E-04	2.36E-04	4.23E-04	U	1.25E-04	3.01E-04	6.37E-04	U
MLR	5–10	4/3/2025	9.54E-05	1.98E-04	4.20E-04	U	8.68E-05	2.02E-04	4.12E-04	U	7.33E-05	1.94E-04	5.06E-04	U
WEE	0–2	3/6/2025	-2.67E-05	7.68E-05	4.06E-04	U	6.86E-05	1.88E-04	4.07E-04	U	2.86E-05	1.62E-04	5.62E-04	U
WEE	2–5	3/6/2025	-2.29E-05	7.12E-05	4.11E-04	U	7.25E-05	1.86E-04	4.10E-04	U	1.89E-04	2.66E-04	5.48E-04	U
WEE	5–10	3/6/2025	-3.44E-05	8.96E-05	4.44E-04	U	1.41E-04	2.28E-04	4.28E-04	U	2.09E-04	2.31E-04	5.07E-04	U
SMR	0–2	4/3/2025	-2.68E-05	8.69E-05	4.52E-04	U	2.51E-04	3.09E-04	4.48E-04	U	3.56E-04	3.38E-04	5.44E-04	U
SMR	2–5	4/3/2025	-3.41E-05	9.18E-05	4.15E-04	U	2.28E-04	2.66E-04	3.95E-04	U	2.30E-04	2.71E-04	5.13E-04	U
SMR	5–10	4/3/2025	9.02E-05	1.81E-04	3.77E-04	U	1.98E-04	2.49E-04	4.13E-04	U	2.15E-04	2.56E-04	5.03E-04	U
SEC	0–2	4/3/2025	-4.77E-05	1.09E-04	4.20E-04	U	2.14E-04	2.78E-04	4.33E-04	U	2.62E-04	3.27E-04	5.77E-04	U
SEC	2–5	4/3/2025	-3.99E-05	1.04E-04	4.56E-04	U	1.66E-04	2.64E-04	4.42E-04	U	2.23E-04	2.89E-04	5.57E-04	U
SEC	5–10	4/3/2025	-5.40E-05	1.16E-04	4.39E-04	U	1.58E-04	2.41E-04	4.12E-04	U	3.85E-05	1.59E-04	5.32E-04	U
WSS	0–2	3/6/2025	1.46E-05	1.63E-04	4.21E-04	U	7.89E-05	2.02E-04	3.98E-04	U	1.77E-04	2.61E-04	5.44E-04	U
WSS	2–5	3/6/2025	2.30E-05	1.57E-04	4.33E-04	U	1.65E-04	2.26E-04	3.69E-04	U	1.61E-04	2.20E-04	5.07E-04	U
WSS	5–10	3/6/2025	-2.16E-05	6.98E-05	3.89E-04	U	4.69E-05	1.26E-04	3.41E-04	U	2.95E-05	1.67E-04	5.53E-04	U
WSS Dup	0–2	3/6/2025	-3.88E-05	9.33E-05	4.18E-04	U	1.43E-04	2.15E-04	3.76E-04	U	2.57E-05	1.34E-04	5.20E-04	U
WSS Dup	2–5	3/6/2025	-2.89E-05	8.02E-05	4.03E-04	U	3.08E-05	1.37E-04	3.69E-04	U	1.47E-04	2.33E-04	5.34E-04	U
WSS Dup	5–10	3/6/2025	3.30E-05	1.37E-04	4.15E-04	U	3.10E-05	1.38E-04	3.87E-04	U	1.29E-04	2.29E-04	5.49E-04	U

Note. See appendix B for sampling location codes. Units are in Bq/g, dry weight.

- Radionuclide activity. Only radionuclides with activities greater than 2 σ TPU and the MDC are considered detections. Samples may have a negative value when background radioactivity is subtracted.
- Total propagated uncertainty.
- Minimum detectable concentration.
- Qualifier. Indicates whether radionuclide was detected. Equal sign (=) denotes detected. U denotes undetected.

Table F.15 – Gamma Radionuclides and ^{90}Sr Activity in Soil Samples Collected on and Near the WIPP Site

Location	Depth (cm)	Sample Date	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d
			^{40}K				^{60}Co			
WFF	0–2	3/6/2025	1.83E-01	1.88E-02	1.45E-02	=	4.09E-04	5.22E-04	1.07E-03	U
WFF	2–5	3/6/2025	2.10E-01	1.91E-02	1.34E-02	=	-1.79E-04	5.55E-04	9.65E-04	U
WFF	5–10	3/6/2025	2.03E-01	2.29E-02	2.53E-02	=	-1.01E-04	6.13E-04	1.07E-03	U
MLR	0–2	4/3/2025	3.29E-01	2.64E-02	1.86E-02	=	7.35E-04	5.43E-04	1.20E-03	U
MLR	2–5	4/3/2025	3.18E-01	3.24E-02	2.18E-02	=	2.82E-04	7.95E-04	1.64E-03	U
MLR	5–10	4/3/2025	3.53E-01	2.82E-02	2.03E-02	=	3.41E-04	8.12E-04	1.55E-03	U
WEE	0–2	3/6/2025	2.34E-01	2.15E-02	1.75E-02	=	3.66E-04	7.04E-04	1.12E-03	U
WEE	2–5	3/6/2025	2.05E-01	1.84E-02	1.33E-02	=	-5.81E-05	5.05E-04	8.98E-04	U
WEE	5–10	3/6/2025	2.20E-01	2.04E-02	1.45E-02	=	1.02E-04	5.86E-04	1.08E-03	U
SMR	0–2	4/3/2025	3.03E-01	2.47E-02	1.81E-02	=	-1.63E-04	6.73E-04	1.14E-03	U
SMR	2–5	4/3/2025	3.00E-01	2.51E-02	1.86E-02	=	4.71E-04	5.75E-04	1.20E-03	U
SMR	5–10	4/3/2025	3.13E-01	2.56E-02	1.91E-02	=	-2.25E-04	7.02E-04	1.26E-03	U
SEC	0–2	4/3/2025	2.34E-01	2.09E-02	1.54E-02	=	-1.20E-04	5.31E-04	8.33E-04	U
SEC	2–5	4/3/2025	2.47E-01	2.29E-02	1.72E-02	=	3.93E-04	6.11E-04	1.22E-03	U
SEC	5–10	4/3/2025	2.53E-01	2.31E-02	1.83E-02	=	2.23E-04	6.48E-04	1.19E-03	U
WSS	0–2	3/6/2025	2.13E-01	2.02E-02	1.66E-02	=	-2.96E-04	6.08E-04	1.07E-03	U
WSS	2–5	3/6/2025	2.06E-01	2.48E-02	1.76E-02	=	-1.76E-04	7.17E-04	1.35E-03	U
WSS	5–10	3/6/2025	2.16E-01	2.18E-02	1.83E-02	=	-3.49E-04	7.58E-04	1.30E-03	U
WSS Dup	0–2	3/6/2025	2.15E-01	2.07E-02	1.62E-02	=	2.76E-04	5.92E-04	1.09E-03	U
WSS Dup	2–5	3/6/2025	2.02E-01	2.02E-02	1.85E-02	=	8.34E-05	5.73E-04	1.09E-03	U
WSS Dup	5–10	3/6/2025	2.19E-01	2.09E-02	1.61E-02	=	2.29E-05	7.10E-04	1.33E-03	U

Location	Depth (cm)	Sample Date	[RN] ¹	2 σ TPU ²	MDC ³	Q ⁴	[RN] ¹	2 σ TPU ²	MDC ³	Q ⁴
			¹³⁷ Cs				⁹⁰ Sr			
WFF	0–2	3/6/2025	1.30E-03	8.68E-04	1.39E-03	U	2.95E-03	7.48E-03	1.13E-02	U
WFF	2–5	3/6/2025	2.30E-03	8.14E-04	1.19E-03	=	1.31E-03	7.51E-03	1.13E-02	U
WFF	5–10	3/6/2025	1.50E-03	7.59E-04	1.17E-03	=	-1.76E-03	7.55E-03	1.13E-02	U
MLR	0–2	4/3/2025	4.99E-03	1.13E-03	1.53E-03	=	1.63E-04	1.10E-02	1.13E-02	U
MLR	2–5	4/3/2025	3.35E-03	1.33E-03	1.98E-03	=	-5.40E-03	1.12E-02	1.14E-02	U
MLR	5–10	4/3/2025	1.50E-03	1.00E-03	1.61E-03	U	-2.77E-03	1.10E-02	1.14E-02	U
WEE	0–2	3/6/2025	1.71E-03	9.49E-04	1.51E-03	=	4.24E-04	8.10E-03	1.12E-02	U
WEE	2–5	3/6/2025	1.34E-03	6.84E-04	1.06E-03	=	-2.04E-03	8.77E-03	1.13E-02	U
WEE	5–10	3/6/2025	6.99E-04	6.77E-04	1.12E-03	U	-3.70E-03	7.81E-03	1.12E-02	U
SMR	0–2	4/3/2025	3.76E-03	1.20E-03	1.79E-03	=	-1.78E-03	1.12E-02	1.14E-02	U
SMR	2–5	4/3/2025	4.34E-03	1.17E-03	1.67E-03	=	-3.47E-03	1.14E-02	1.14E-02	U
SMR	5–10	4/3/2025	2.63E-03	1.16E-03	1.81E-03	=	9.80E-04	1.16E-02	1.14E-02	U
SEC	0–2	4/3/2025	1.85E-03	8.56E-04	1.32E-03	=	-4.03E-04	1.16E-02	1.14E-02	U
SEC	2–5	4/3/2025	2.01E-03	9.39E-04	1.44E-03	=	-6.73E-03	1.22E-02	1.16E-02	U
SEC	5–10	4/3/2025	1.42E-03	9.06E-04	1.45E-03	U	-7.91E-03	1.20E-02	1.16E-02	U
WSS	0–2	3/6/2025	1.67E-03	8.39E-04	1.31E-03	=	-6.37E-04	7.30E-03	1.12E-02	U
WSS	2–5	3/6/2025	1.30E-03	7.59E-04	1.59E-03	U	1.78E-03	8.10E-03	1.14E-02	U
WSS	5–10	3/6/2025	1.30E-03	7.74E-04	1.53E-03	U	3.64E-03	7.69E-03	1.13E-02	U
WSS Dup	0–2	3/6/2025	2.08E-03	8.27E-04	1.23E-03	=	-5.26E-04	7.66E-03	1.11E-02	U
WSS Dup	2–5	3/6/2025	1.32E-03	8.67E-04	1.40E-03	U	1.43E-03	7.75E-03	1.11E-02	U
WSS Dup	5–10	3/6/2025	7.69E-04	6.54E-04	1.06E-03	U	1.33E-03	7.92E-03	1.12E-02	U

Note. See appendix B for sampling location codes. Units are in Bq/g, dry weight.

- Radionuclide activity. Only radionuclides with activities greater than 2 σ TPU and the MDC are considered detections. Samples may have a negative value when background radioactivity is subtracted.
- Total propagated uncertainty.
- Minimum detectable concentration.
- Qualifier. Indicates whether radionuclide was detected. Equal sign (=) denotes detected. U denotes undetected.

Table F.16 – Uranium, Plutonium, and Americium Activity in Vegetation Samples Collected on and Near the WIPP Site

Location	Sample Date	^{233/234} U				²³⁵ U				²³⁸ U			
		[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d
SMR	8/21/2025	2.31E-03	8.99E-03	1.74E-02	U	1.84E-03	6.90E-03	1.16E-02	U	-1.41E-03	4.26E-03	1.20E-02	U
MLR	8/28/2025	-7.17E-04	6.91E-03	1.65E-02	U	8.25E-03	1.19E-02	1.43E-02	U	1.94E-04	8.90E-03	1.95E-02	U
SEC	9/13/2025	4.04E-03	9.80E-03	1.70E-02	U	-1.46E-03	6.45E-03	1.68E-02	U	4.91E-03	8.43E-03	7.36E-03	U
WFF	7/21/2025	3.38E-04	1.57E-04	9.18E-04	U	1.28E-05	4.37E-05	3.19E-04	U	3.62E-04	1.66E-04	7.14E-04	U
WSS	7/21/2025	4.88E-04	1.86E-04	9.15E-04	U	3.17E-05	5.28E-05	3.16E-04	U	4.56E-04	1.79E-04	7.10E-04	U
WSS Dup	7/21/2025	2.69E-04	1.43E-04	9.20E-04	U	3.35E-05	6.06E-05	3.21E-04	U	2.69E-04	1.43E-04	7.15E-04	U
WEE	7/21/2025	3.92E-04	1.64E-04	9.14E-04	U	-6.42E-06	2.08E-05	3.14E-04	U	3.62E-04	1.56E-04	7.08E-04	U
Location	Sample Date	²³⁸ Pu				^{239/240} Pu				²⁴¹ Am			
		[RN] ¹	2 σ TPU ²	MDC ³	Q ⁴	[RN] ¹	2 σ TPU ²	MDC ³	Q ⁴	[RN] ¹	2 σ TPU ²	MDC ³	Q ⁴
SMR	8/21/2025	2.52E-03	5.80E-03	9.19E-03	U	5.48E-03	8.26E-03	1.28E-02	U	5.25E-03	7.60E-03	9.13E-03	U
MLR	8/28/2025	-4.63E-04	6.96E-03	1.62E-02	U	4.24E-03	1.07E-02	1.93E-02	U	1.15E-03	6.38E-03	1.22E-02	U
SEC	9/13/2025	9.90E-04	5.51E-03	1.05E-02	U	1.44E-03	5.41E-03	9.09E-03	U	1.89E-03	7.08E-03	1.19E-02	U
WFF	7/21/2025	-6.38E-06	1.83E-05	1.80E-04	U	-7.28E-06	1.96E-05	2.33E-04	U	2.09E-05	3.86E-05	3.01E-04	U
WSS	7/21/2025	-6.78E-06	1.88E-05	1.80E-04	U	5.41E-06	3.35E-05	2.33E-04	U	4.54E-05	5.22E-05	3.01E-04	U
WSS Dup	7/21/2025	-9.95E-06	2.60E-05	1.94E-04	U	2.39E-05	5.60E-05	2.47E-04	U	2.07E-05	4.54E-05	3.07E-04	U
WEE	7/21/2025	-7.58E-06	1.92E-05	1.77E-04	U	-9.67E-06	2.17E-05	2.30E-04	U	4.74E-05	5.90E-05	3.05E-04	U

Note. See appendix B for sampling location codes. Units are in Bq/g, dry weight.

- Radionuclide activity. Only radionuclides with activities greater than 2 σ TPU and the MDC are considered detections. Samples may have a negative value when background radioactivity is subtracted.
- Total propagated uncertainty.
- Minimum detectable concentration.
- Qualifier. Indicates whether radionuclide was detected. Equal sign (=) denotes detected. U denotes undetected.

Table F.17 – Gamma and ^{90}Sr Radionuclide Activity in Vegetation Samples Collected on and Near the WIPP Site

Location	Sample Date	^{40}K				^{60}Co			
		[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d
SMR	8/21/25	8.45E-01	1.47E-01	4.06E-02	H=	-6.98E-06	3.12E-03	6.40E-03	HU
MLR	8/28/25	7.31E-01	1.13E-01	3.18E-02	H=	3.15E-03	2.64E-03	3.33E-03	HU
SEC	9/13/25	2.91E-01	1.07E-01	5.39E-02	H=	1.63E-03	2.92E-03	6.75E-03	HU
WFF	7/21/2025	4.11E-01	1.00E-01	1.35E-01	=	3.95E-04	3.33E-03	6.56E-03	U
WSS	7/21/2025	9.15E-01	1.26E-01	1.21E-01	=	2.92E-03	3.96E-03	7.47E-03	U
WSS Dup	7/21/2025	7.19E-01	1.10E-01	1.10E-01	=	5.73E-03	3.89E-03	8.35E-03	U
WEE	7/21/2025	8.20E-01	1.06E-01	9.12E-02	=	-1.42E-03	2.61E-03	4.13E-03	U
Location	Sample Date	^{137}Cs				^{90}Sr			
		[RN] ¹	2 σ TPU ²	MDC ³	Q ⁴	[RN] ¹	2 σ TPU ²	MDC ³	Q ⁴
SMR	8/21/25	2.77E-03	3.30E-03	3.44E-03	HU	-6.56E-03	1.40E-02	2.85E-02	HU
MLR	8/28/25	2.85E-04	2.14E-03	3.72E-03	HU	1.80E-02	1.63E-02	2.59E-02	HU
SEC	9/13/25	1.37E-04	2.79E-03	5.38E-03	HU	1.79E-02	1.53E-02	2.37E-02	HU
WFF	7/21/2025	4.42E-03	3.10E-03	6.51E-03	U	1.77E-03	2.06E-03	1.03E-02	U
WSS	7/21/2025	-4.91E-05	3.17E-03	5.86E-03	U	1.17E-03	2.03E-03	1.03E-02	U
WSS Dup	7/21/2025	1.67E-03	3.75E-03	6.90E-03	U	2.49E-03	2.13E-03	1.03E-02	U
WEE	7/21/2025	-2.76E-05	3.35E-03	5.65E-03	U	4.79E-03	2.23E-03	1.03E-02	U

Note. See appendix B for sampling location codes. Units are in Bq/g, dry weight.

- Radionuclide activity. Only radionuclides with activities greater than 2 σ TPU and the MDC are considered detections. Samples may have a negative value when background radioactivity is subtracted.
- Total propagated uncertainty.
- Minimum detectable concentration.
- Qualifier. Indicates whether radionuclide was detected. Equal sign (=) denotes detected. U denotes undetected. H denotes analytical holding time exceeded.

Table F.18 – Uranium, Plutonium, and Americium Radionuclide Activity in Fauna Samples

Type	Location	Sample Date	^{233/234} U				²³⁵ U				²³⁸ U			
			[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d
Rabbit	SOO	3/11/2025	1.67E-05	2.36E-05	9.32E-04	U	1.14E-06	1.73E-06	3.18E-04	U	1.75E-05	2.47E-05	6.72E-04	U
Rabbit	SOO	8/5/25	2.63E-03	1.24E-02	2.45E-02	HU	-8.95E-04	7.74E-03	1.79E-02	HU	-1.45E-03	6.42E-03	1.67E-02	HU
Quail	WIP	12/16/25	-4.10E-03	5.55E-03	1.90E-02	U	-7.74E-04	6.69E-03	1.55E-02	U	4.59E-03	9.04E-03	1.25E-02	U
Type	Location	Sample Date	²³⁸ Pu				^{239/240} Pu				²⁴¹ Am			
			[RN] ¹	2 σ TPU ²	MDC ³	Q ⁴	[RN] ¹	2 σ TPU ²	MDC ³	Q ⁴	[RN] ¹	2 σ TPU ²	MDC ³	Q ⁴
Rabbit	SOO	3/11/2025	5.42E-08	1.96E-07	1.54E-04	U	1.25E-07	2.67E-07	1.76E-04	U	3.36E-07	4.89E-07	2.70E-04	U
Rabbit	SOO	8/5/25	6.74E-03	9.75E-03	1.17E-02	HU	-2.33E-03	5.42E-03	1.60E-02	HU	3.95E-03	7.77E-03	1.08E-02	HU
Quail	WIP	12/16/25	-1.89E-03	9.85E-03	2.29E-02	U	5.12E-03	9.08E-03	1.37E-02	U	4.52E-03	8.90E-03	1.23E-02	U

Note. See appendix B for sampling location codes. Units are in Bq/g, dry weight.

- Radionuclide activity. Only radionuclides with activities greater than 2 σ TPU and the MDC are considered detections. Samples may have a negative value when background radioactivity is subtracted.
- Total propagated uncertainty.
- Minimum detectable concentration.
- Qualifier. Indicates whether radionuclide was detected. Equal sign (=) denotes detected. U denotes undetected. H denotes analytical holding time exceeded.

Table F.19 – Gamma Radionuclides and ⁹⁰Sr Radionuclide Activity in Fauna Samples

Type	Location	Sample Date	⁴⁰ K				⁶⁰ Co			
			[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d	[RN] ^a	2 σ TPU ^b	MDC ^c	Q ^d
Rabbit	SOO	3/11/2025	9.18E-02	1.08E-02	8.87E-03	=	1.29E-04	3.67E-04	5.71E-04	U
Rabbit	SOO	8/5/25	2.91E-01	6.47E-02	2.72E-02	H=	2.65E-04	1.36E-03	2.90E-03	HU
Quail	WIP	12/16/25	2.77E-01	5.93E-02	2.72E-02	=	-8.84E-04	1.26E-03	1.83E-03	U
Type	Location	Sample Date	¹³⁷ Cs				⁹⁰ Sr			
			[RN] ¹	2 σ TPU ²	MDC ³	Q ⁴	[RN] ¹	2 σ TPU ²	MDC ³	Q ⁴
Rabbit	SOO	3/11/2025	-1.15E-04	3.15E-04	5.36E-04	U	7.58E-05	1.40E-05	1.05E-02	U
Rabbit	SOO	8/5/25	-3.41E-04	9.90E-04	1.85E-03	HU	2.64E-02	2.21E-02	3.17E-02	HU
Quail	WIP	12/16/25	0.00E+00	2.16E-03	2.13E-03	U	1.23E-02	3.13E-02	5.47E-02	U

Note. See appendix B for sampling location codes. Units are in Bq/g, dry weight.

- Radionuclide activity. Only radionuclides with activities greater than 2 σ TPU and the MDC are considered detections. Samples may have a negative value when background radioactivity is subtracted.
- Total propagated uncertainty.
- Minimum detectable concentration.
- Qualifier. Indicates whether radionuclide was detected. Equal sign (=) denotes detected. U denotes undetected. H denotes analytical holding time exceeded.