Department of Environmental Quality
INL Oversight Program

ENVIRONMENTAL SURVEILLANCE PROGRAM
QUARTERLY DATA REPORT

April - June, 2025

Boise Office
1410 N. Hilton
Boise, Idaho 83706
208-373-0428

Idaho Falls Office
900 N. Skyline, Suite B
Idaho Falls, Idaho 83402
208-528-2600

Table of Contents

List of Tables

List of Figures

Table of Acronyms and Abbreviations

ATR - Advanced Test Reactor Complex
BEA - Battelle Energy Alliance, LLC
BLR - Big Lost River
CFA - Central Facilities Area
CFR - Code of Federal Regulations
CITRC - Critical Infrastructure Test Range Complex
CMS - Community Monitoring Station
DCS - DOE Derived Concentration Standard
DEQ-INL OP - The State of Idaho, Department of Environmental Quality, Idaho National Laboratory Oversight Program
DOE - U.S. Department of Energy
EBR I & II - Experimental Breeder Reactors I & II
EFS - Experimental Field Station
EIC - electret ionization chamber
EML - Environmental Monitoring Laboratory
EPA - Environmental Protection Agency
ESER - Environmental Surveillance, Education and Research Program
ESP - Environmental Surveillance Program
ESRP - Eastern Snake River Plain
ft bls - feet below land surface
HPIC - high-pressure ion chamber
IBL - Idaho Bureau of Laboratories
IBL Sub - Subcontract laboratory to IBL
ICPP - Idaho Chemical Processing Plant
IDAPA - Idaho Administrative Procedure Act
IEC - Idaho Environmental Coalition
IF - Idaho Falls, Idaho
INL - Idaho National Laboratory
INTEC - Idaho Nuclear Technology and Engineering Center
ISB - In-situ bioremediation
ISU - Idaho State University
ISU Sub - Subcontract laboratory to ISU-EML
IWP - MFC Industrial Waste Pipeline
MCL - maximum contaminant level
MDC - minimum detectable concentration
MDL - IBL method detection limit
MFC - Materials and Fuels Complex
µg/L - micrograms per liter
mg/L - milligrams per liter
mm - millimeter
MP - milepost
mR - milliRoentgen
mrem - millirem or 1/1000th of a rem
µR/hr - microRoentgen per hour
µR/yr - microRoentgen per year
MV - Magic Valley
NCRP - National Council on Radiation Protection and Measurements
NRF - Naval Reactors Facility
PBF - Power Burst Facility
pCi/g - picoCuries per gram
pCi/L - picoCuries per liter
pCi/m^3 - picoCuries per cubic meter
PCS - Idaho Primary Constituent Standard
PT Program - Laboratory Proficiency Testing Program
PW - Perched water well designation
QA/QC - Quality Assurance/Quality Control
rad - unit of absorbed radiation dose
RadNet - EPA network of radiation monitoring stations
RDL - IBL reporting detection limit
RPD - relative percent difference
R/rad - Roentgen/rad
RWMC - Radioactive Waste Management Complex
SD - Sample standard deviation
SMC - Specific Manufacturing Capability
SMCL - secondary maximum contaminant level
TAN - Test Area North
TRA - Test Reactor Area
TSP - total suspended particulate
USGS - U.S. Geological Survey
VOC - volatile organic compound

Introduction

The State of Idaho, Department of Environmental Quality, Idaho National Laboratory Oversight Program (DEQ-INL OP) conducts an Environmental Surveillance Program (ESP) at locations on the INL, near the boundaries of the INL, and at distant locations to the INL in accordance with accepted monitoring procedures and management practices. This program is designed to provide the people of the state of Idaho with independently evaluated information about the impacts of the Department of Energy's (DOE) activities in Idaho.

The primary objective for DEQ-INL OP's ESP is to maintain an independent environmental monitoring and verification program designed to verify and supplement DOE's environmental data and programs. This program also provides the citizens of Idaho with information on current and proposed DOE programs that have been independently evaluated to enable them to reach informed conclusions about DOE activities in Idaho and potential impacts to public health and the environment.

Results of the ESP are published using two distinct reporting formats: quarterly data reports and an annual ESP report. The annual ESP report is designed for a broad audience and summarizes the results of the ESP for the previous four quarters. The annual report's primary emphasis is to focus on trends, ascertain the impacts of DOE operations on the environment, and confirm the validity of DOE monitoring programs. This quarterly report is designed to document the results of the ESP on a quarterly basis and provide detailed data. It is organized according to the media sampled and also provides a quality assurance assessment.

Changes to Qualification and Reporting of Sample Results

Starting in the first quarter of 2024, DEQ-INL OP has changed the methods used for qualifying and reporting sample results. These changes apply primarily to low-level results. The changes listed below bring DEQ-INL OP's qualification and reporting conventions more closely in line with the INL contractors' methods.

For radiological results, the minimum detectable concentration (MDC) is no longer used as the criterion above which the result is considered a positive detection. The following criteria are used instead[1,2,3]:

1. Results greater or equal to 3 SD are reported as positive detections, where SD is the sample standard deviation.
2. Results less than 3 SD are reported as non-detections (U qualifier).
3. Field sample results are reported together with the 1-SD value.

For non-radiological results, the qualification and reporting conventions followed by the sample analysis contractor, Idaho Bureau of Laboratories (IBL), are used. With each result, the IBL reports both the Method Detection Limit[4] (MDL) and the higher Reporting Detection Limit[5] (RDL).

[1] Idaho National Laboratory Site Environmental Surveillance Program Report, Third Quarter 2023, INL/RPT-24-77413, p.
[2] HANDBOOK FOR THE DEPARTMENT OF ENERGY'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP), MAPEP-HB-1, July 6,2022, p.30.
[3] An Update of Hydrologic Conditions and Distribution of Selected Constituents in Water, Eastern Snake River Aquifer and Perched Groundwater Zones, Idaho National Laboratory, Idaho, Emphasis 2019–21, U. S. Geological Survey, DOE/ID-22261, p. 29.
[4] The MDL is defined as the minimum concentration of substance that can be measured and reported with 99% confidence that an analyte concentration is greater than zero and is determined from an analysis of a sample in a given matrix containing the analyte.
[5] IBL utilizes the Practical Quantitation Limit (PQL) as the Reporting Detection Limit (RDL) for final data reports. PQL represents a practical and routinely achievable quantitation limit with a high degree of certainty (> 99.9% confidence) that the result is a positive detection.

1. Results greater than MDL and greater than RDL are reported as positive detections.
2. Results greater than MDL but less than RDL are reported as detected estimates (J qualifier) with greater associated uncertainty.
3. Results less than MDL are non-detections and reported as less than (RDL value).

Appendix C is a summary of the analyzing laboratories' MDCs for radiological analytes and RDLs for non-radiological analytes, together with the EPA Maximum Contaminant Levels (MCLs) and DOE Derived Concentration Standards (DCSs) for comparison. MDCs are a measure of method/instrument performance. They are not a criterion above which a result is considered a detection. DCSs and MCLs are listed only as reference values for comparison to typical MDC or RDL ranges. The MCLs are the most restrictive and do not necessarily apply to the environmental media sampled.

Air and Precipitation Monitoring Results

The ESP operated nine air monitoring stations on and near the INL as well as two monitoring stations distant from the INL during the second quarter, 2025 (**Figure 1**). These stations employed instrumentation for collecting airborne particulate matter, gaseous radioiodine, precipitation, and water vapor for tritium analysis (**Table 1**). The Shoshone-Bannock Tribes operated an air monitoring station located at Fort Hall. The Fort Hall station uses identical instrumentation and sampling protocol as the eleven stations operated by the ESP. The DEQ-INL OP reports the Fort Hall station data as an additional distant site.

Airborne particulate matter was sampled using both high-volume (8x10-inch filter) and low-volume (47-mm filter) total suspended particulate (TSP) air samplers. Weekly gross alpha and gross beta particulate radioactivity results for 47-mm filters from the low-volume TSP samplers are presented in **Appendix A** and summarized as a range of results in **Table 2**. Results are within the expected historical range.

Composites of 47-mm filters collected from low-volume TSP samplers during a calendar quarter are analyzed using gamma spectrometry. Composites of 8x10-inch filters collected from high-volume TSP samplers during each calendar month are also analyzed using gamma spectrometry. Typically, gamma spectrometry results are only reported by ISU-EML when exceeding their minimum detectable concentration (MDC). Gamma spectrometry results for the second quarter of 2025 for 47-mm and 8x10-inch TSP filters are presented in **Tables 3** and **4**. For the 47-mm filter composites, there were no reported man-made gamma-emitting radionuclide concentrations greater than 3 SD. For all site locations, beryllium-7 (Be-7), a naturally occurring, cosmogenic radionuclide was reported. For the 8x10-inch filter composites, there were three cesium-137 (Cs-137) results greater than or equal to 3 SD at Van Buren, Mud Lake, and Fort Hall stations. The concentration and 1 SD values for cesium-137 (Cs-137) are reported for all locations since Cs-137 is the most likely of the man-made gamma emitting radionuclides to be detected unless otherwise noted. Beryllium-7 results were greater than 3 SD at all site locations.

Quarterly composites of high-volume 8x10-inch TSP filters are analyzed using radiochemical separation techniques. Results from these composite filter analyses are typically presented in the following quarter's report. The samples are analyzed for Strontium-90, Plutonium-238, Plutonium-239/240, and Americium-241. Measurable quantities of these radionuclides are expected in the environment due to historic above ground testing of nuclear weapons, and possibly from INL programs. DEQ-INL OP's action levels of 19 for Americium-241 (Am-241), 190 for Strontium-90 (Sr-90), 21 for Plutonium-238 (Pu-238), and 20 for Plutonium-239/240 (Pu-239/240) (in 1×10^{-5} pCi/m^3) are 10 percent of the compliance

values listed for the specific radionuclides in 40 CFR 61, Appendix E, Table 2. Field sample concentrations which exceed these levels require further investigation.

Radiochemical separation analysis results for 8x10-inch TSP particulate filter composites collected during first quarter 2025 are presented in **Table 5.** Positive Sr-90 detections were observed at all locations except the Mud Lake station, with results exceeding three times the sample standard deviation. These detections were well below DEQ-INL OP action levels.

Radioactive iodine samples are collected weekly. Samples are collected by drawing air through a canister filled with activated charcoal using a low-volume air pump. The activated charcoal contained in the canister traps the radioiodine by adsorption onto its porous surface. Each week, canisters are collected from all twelve air monitoring stations and analyzed together as a composite using gamma spectrometry (**Table 6**). If Iodine-131 is detected in this grouping, the canisters are individually analyzed. No radioactive isotopes of iodine, specifically Iodine-131, were detected on the weekly charcoal cartridges used to collect this nuclide during the second quarter of 2025.

Atmospheric moisture was collected by drawing air through hygroscopic media at each of the twelve monitoring stations. The moisture was stripped from the hygroscopic media and analyzed to calculate the atmospheric tritium (H-3) concentration. Sequential atmospheric tritium concentrations are presented in **Table 7** with all considered laboratory analysis “estimates” (J-qualified) except for the Idaho Falls sample collected from 03-27-2025 to 04-24-2025. Those equal to or exceeding three standard deviations of uncertainty were considered positive detections. There were six detections at on-site locations, two at boundary locations, and two at distant locations (**Table 7**). The ratios of detections to stations for on-site and distant locations were 6 to 5 (1.2) and 2 to 3 (0.67) respectively, which is suggestive of onsite detections of both cosmogenic and DOE-INL produced airborne tritium. Finally, all the airborne tritium detections were below our action level of 150 pCi/m^3 (which is 10% of DOE-INL’s compliance standard set forth in 40 CFR 61, Appendix E, Table 2).

Precipitation was collected at one on-site monitoring location (Big Lost River Rest Area), four boundary locations (Atomic City, Howe, Mud Lake, and Monteview) and one distant location (Idaho Falls) during the second quarter of 2025. Samples were then analyzed for tritium and man-made gamma emitting radionuclides; DEQ INL OP’s singular finding was a tritium detection at Atomic City collected from 05-15-2025 to 06-26-2025. Analysis results for tritium and Cesium-137 are presented in **Table 8**.

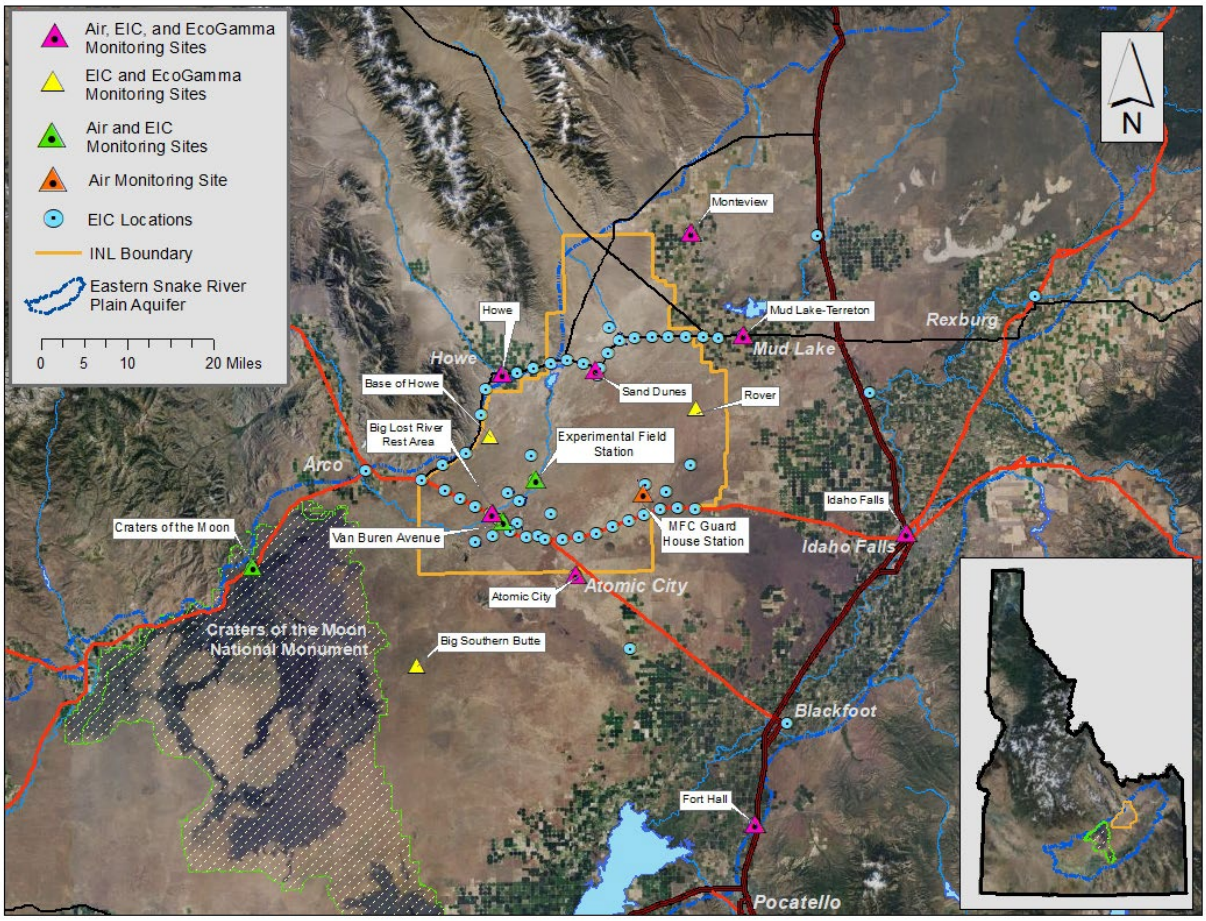

Figure 1. Air and radiation monitoring sites.

Table 1. Sampling locations and sample type.

Station Locations	Sample type[1]			
	TSP	Radioiodine	Water Vapor	Precipitation
On-site Locations				
Big Lost River Rest Area	□	□	■	■
Experimental Field Station	□	□	■	
MFC[3] Guard House	□	□	■	
Sand Dunes Tower	□	□	■	
Van Buren Avenue	□	□	■	
Boundary Locations				
Atomic City	□	□	■	■
Howe	□	□	■	■
Monteview	□	□	■	■
Mud Lake	□	□	■	■
Distant Locations				
Craters of the Moon	□	□	■	
Fort Hall[2]	□	□	■	
Idaho Falls	□	□	■	■

[1] □Samples collected weekly; ■ Samples collected quarterly, or more frequently if sample containers reach capacity.
[2]TSP and radioiodine samples collected by Shoshone-Bannock Tribes.
[3] MFC – Materials and Fuels Complex. MFC Guard House is a relatively new monitoring location. Data collection began here during the week of 5/16 - 5/23/24.

Table 2. Range of gross alpha and gross beta concentrations for 47-mm TSP filters, second quarter, 2025.

Station Location	Concentration					
	Gross Alpha			Gross Beta		
On-Site Locations						
Big Lost River Rest Area	**0.6**	-	**1.6 J[2]**	**13.6**	-	**28.6**
Experimental Field Station	**0.6**	-	**1.4**	**13.1**	-	**29.0**
MFC Guard House[3]	0.4	-	**2.1**	**12.2**	-	**28.1**
Sand Dunes Tower	0.4	-	**1.5**	**12.4**	-	**26.6**
Van Buren Avenue	0.5	-	**1.5**	**14.4**	-	**34.1**
Boundary Locations						
Atomic City	**0.9**	-	**2.3**	**14.2**	-	**28.3**
Howe	0.5 J[2]	-	**1.5 J[2]**	**14.3 J[2]**	-	**27.1 J[2]**
Monteview	0.4	-	**1.5**	**13.2**	-	**27.5**
Mud Lake	0.4	-	**1.8**	**13.7**	-	**26.0**
Distant Locations						
Craters of the Moon	0.4	-	**1.6**	**10.8**	-	**25.7**
Fort Hall[1]	0.5	-	**2.2**	**11.9**	-	**28.6**
Idaho Falls	**0.7**	-	**1.9**	**12.8**	-	**29.1**

Concentrations are expressed in 1 x 10^{-3} pCi/m^3. **Bold** concentrations are positive detections, greater than or equal to 3 SD.
[1]Operated by Shoshone-Bannock Tribes.
[2]Volume is an estimate due to mechanical failure. Results are considered to be a usable estimate (J).
[3]Materials and Fuels Complex.

Table 3. Gamma spectroscopy analysis data for 47-mm TSP filters, composite samples, second quarter, 2025.

Station Location	Naturally Occurring Radionuclide Beryllium-7			Man-Made Gamma Emitting Radionuclides		
	Concentration		1 SD	Concentration[2]		1 SD[2]
On-site Locations						
Big Lost River Rest Area	**98.7**	J[3]	3.9	0.04	UJ[3]	0.04
Experimental Field Station	**100.0**	-	3.1	0.00	U	0.06
MFC[6] Guard House	**96.4**	-	3.8	0.05	U	0.04
Sand Dunes Tower	**99.1**	-	3.2	-0.01	U	0.03
Van Buren Avenue	**107.2**	-	3.4	-0.05	U	0.04
Boundary Locations						
Atomic City	**97.5**	-	3.8	0.04	U	0.04
Howe	**103.9**	J[4]	3.2	0.04	UJ[4]	0.04
Monteview	**96.2**	J[5]	2.9	0.05	UJ[5]	0.04
Mud Lake	**92.6**	-	2.8	0.02	U	0.05
Distant Locations						
Craters of the Moon	**91.5**	-	2.8	0.08	U	0.04
Fort Hall[1]	**92.8**	-	3.0	-0.01	U	0.03
Idaho Falls	**93.3**	-	3.0	-0.07	U	0.04

Concentrations are reported in 1 x 10^{-3} pCi/m^3 with associated uncertainty (1 SD). **Bold** concentrations are positive detections, greater than or equal to 3 SD.

Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.

[1]Operated by Shoshone-Bannock Tribes.

[2]Concentration and uncertainty values are for Cs-137 unless otherwise noted.

[3]Volume is an estimate for one week due to mechanical failure. Results are considered a usable estimate (J).

[4]Volume is an estimate for thirteen weeks due to mechanical failure. Results are considered a usable estimate (J).

[5]Volume is less than expected for one week due to mechanical failure. Results are considered a usable estimate (J).

[6]Materials and Fuels Complex.

Table 4. Gamma spectrometry analysis data for 8x10-inch TSP filters, monthly composite samples, second quarter, 2025.

Station Location	Month[3]	Naturally Occurring Radionuclide Beryllium-7			Man-Made Gamma Emitting Radionuclides		
		Concentration		1 SD	Concentration[2]		1 SD[2]
On-site Locations							
Big Lost River Rest Area	Apr	**130.3**	-	4.0	0.01	U	0.01
	May	**118.4**	-	2.2	0.01	U	0.01
	Jun	**153.9**	-	5.2	0.03	U	0.02
Experimental Field Station	Apr	**135.5**	-	4.1	0.02	U	0.01
	May	**109.5**	-	3.7	0.01	U	0.01
	Jun	**142.5**	-	4.8	0.03	U	0.02
MFC[4] Guard House	Apr	**130.2**	-	4.4	0.02	U	0.01
	May	**119.7**	-	3.7	0.00	U	0.01
	Jun	**160.4**	-	4.9	0.02	U	0.01
Sand Dunes Tower	Apr	**128.4**	-	4.3	0.05	U	0.02
	May	**105.7**	-	3.5	0.01	U	0.01
	Jun	**136.5**	-	4.6	0.00	U	0.01
Van Buren Avenue	Apr	**135.4**	-	2.5	0.01	U	0.01
	May	**115.2**	-	3.9	0.01	U	0.01
	Jun	**137.3**	-	4.2	**0.03**	-	0.01
Boundary Locations							
Atomic City	Apr	**126.4**	-	4.2	0.04	U	0.02
	May	**115.2**	-	2.1	0.02	U	0.01
	Jun	**139.7**	-	2.6	0.02	U	0.02
Howe	Apr	**136.3**	-	4.2	0.02	U	0.01
	May	**106.2**	-	3.2	-0.04	U	0.01
	Jun	**135.9**	-	4.2	0.00	U	0.01
Monteview	Apr	**136.7**	-	4.6	0.01	U	0.02
	May	**112.9**	-	3.5	0.00	U	0.01
	Jun	**141.0**	-	4.7	0.02	U	0.01
Mud Lake	Apr	**129.2**	-	4.0	-0.01	U	0.02
	May	**106.4**	-	3.6	-0.01	U	0.01
	Jun	**144.6**	-	2.7	**0.03**	-	0.01
Distant Locations							
Craters of the Moon	Apr	**131.6**	-	4.0	-0.01	U	0.01
	May	**121.5**	-	3.7	-0.01	U	0.01
	Jun	**143.5**	-	4.8	0.02	U	0.02
Fort Hall[1]	Apr	**114.1**	-	3.8	**0.03**	-	0.01
	May	**104.4**	-	3.2	0.00	U	0.01
	Jun	**114.7**	-	3.5	0.01	U	0.01
Idaho Falls	Apr	**139.7**	-	4.7	0.03	U	0.02
	May	**117.9**	-	2.2	0.00	U	0.01
	Jun	**154.4**	-	2.8	0.02	U	0.02

Concentrations are reported in 1 x 10^{-3} pCi/m^3 with associated uncertainty (1 SD). **Bold** concentrations are positive detections, greater than or equal to 3 SD.

Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.

[1] Operated by Shoshone-Bannock Tribes.

[2] Concentration and SD values are for Cs-137 unless otherwise noted.

[3] Four filters/composite for April and June, five filters/composite for May unless otherwise noted.

[4] Materials and Fuels Complex..

Table 5. Radiochemical separation analysis results for 8x10-inch TSP particulate filter composites collected during first quarter 2025.

Station Location	^{90}Sr			^{238}Pu			$^{239/240}Pu$			^{241}Am		
	Value[1]		1 SD	Value[1]		1 SD	Value[1]		1 SD	Value[1]		1 SD
On-Site Locations												
BLR[4] Rest Area	**1.25**	-	0.21	0.02	U	0.02	0.02	U	0.02	0.06	U	0.03
EFS[3]	**2.26**	-	0.25	-0.02	U	0.03	0.00	U	0.01	0.04	U	0.02
MFC[5] Guard House	**0.88**	-	0.21	0.05	U	0.03	0.04	U	0.02	-0.02	U	0.01
Sand Dunes Tower	**1.43**	-	0.21	0.02	U	0.02	0.02	U	0.02	0.02	U	0.02
Van Buren Avenue	**0.91**	-	0.20	0.02	U	0.04	0.01	U	0.01	0.01	U	0.01
Boundary Locations												
Atomic City	**1.83**	-	0.26	-0.02	U	0.03	0.01	U	0.02	0.05	U	0.03
Howe	**1.30**	-	0.23	0.05	U	0.03	0.02	U	0.02	0.03	U	0.02
Monteview	**1.95**	-	0.25	0.00	U	0.00	0.01	U	0.01	0.01	U	0.02
Mud Lake	0.38	U	0.19	0.03	U	0.03	0.02	U	0.02	0.04	U	0.02
Distant Locations												
Craters of the Moon	**1.09**	-	0.21	-0.02	U	0.03	0.01	U	0.01	0.06	U	0.03
Fort Hall[2]	**1.53**	-	0.23	0.02	U	0.02	0.02	U	0.02	0.05	U	0.02
Idaho Falls	**1.21**	-	0.22	0.01	U	0.01	0.00	U	0.01	0.01	U	0.01

Note: Concentrations are reported in 1 x 10^{-5} pCi/m^3 with associated uncertainty (1 SD) and correspond to filter composites collected during the calendar quarter. **Bold** concentrations are positive detections, greater than or equal to 3 SD.
Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.
[1] Measurable quantities of these radionuclides are expected in the environment due to historic above-ground testing of nuclear weapons, and possibly from INL programs. DEQ-INL OP's action levels of 19 for americium-241, 190 for strontium-90, 21 for plutonium-238, and 20 for plutonium-239/240 (in 1 x 10^{-5} pCi/m^3) are 10 percent of the compliance values listed for the specific radionuclide in 40 CFR 61, Appendix E, Table 2.
[2] Operated by Shoshone-Bannock Tribes.
[3] EFS - Experimental Field Station.
[4] BLR – Big Lost River.
[5] Materials and Fuels Complex.

Table 6. Iodine-131 activity in weekly charcoal filter composites, second quarter, 2025.

Start Date	Collection Date	Iodine-131 activity (pCi/composite)		
		Activity		1 SD
03/27/25	04/03/25	-0.45	U	1.26
04/03/25	04/10/25	0.38	U	0.89
04/10/25	04/17/25	0.37	U	0.92
04/17/25	04/24/25	1.92	U	1.09
04/24/25	05/01/25	-0.62	U	1.01
05/01/25	05/08/25	-0.67	U	1.03
05/08/25	05/15/25	-1.23	U	0.91
05/15/25	05/22/25	0.13	U	0.86
05/22/25	05/29/25	0.34	U	1.50
05/29/25	06/05/25	0.87	U	0.91
06/05/25	06/12/25	0.93	U	1.22
06/12/25	06/18/25	0.34	U	1.28
06/18/25	06/26/25	-0.93	U	1.29

Activities are reported in pCi/composite with associated uncertainty (1 SD). **Bold activities** are positive detections, greater than or equal to 3 SD.
Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.

Table 7. Tritium concentrations in air from atmospheric moisture, second quarter, 2025.

Station Location	Start Date	Collection Date	Tritium		
			Concentration		1 SD
On-site Locations					
Big Lost River Rest Area	03-27-2025	05-01-2025	0.25	UJ	0.11
Big Lost River Rest Area	05-01-2025	05-22-2025	**0.47**	J	0.11
Big Lost River Rest Area	05-22-2025	06-13-2025	**0.40**	J	0.10
Big Lost River Rest Area	06-13-2025	06-26-2025	0.21	UJ	0.13
Experimental Field Station	03-27-2025	05-01-2025	**0.52**	J	0.11
Experimental Field Station	05-01-2025	05-22-2025	0.15	UJ	0.11
Experimental Field Station	05-22-2025	06-12-2025	0.30	UJ	0.10
Experimental Field Station	06-12-2025	06-26-2025	**0.75**	J	0.13
MFC[2] Entrance	03-27-2025	05-01-2025	0.20	UJ	0.07
MFC Entrance	05-01-2025	05-22-2025	0.19	UJ	0.14
MFC Entrance	05-22-2025	06-26-2025	-0.39	UJ	0.12
Sand Dunes Tower	03-27-2025	05-01-2025	0.07	UJ	0.07
Sand Dunes Tower	05-01-2025	05-22-2025	**0.38**	J	0.10
Sand Dunes Tower	05-22-2025	06-26-2025	0.11	UJ	0.07
Van Buren Avenue	03-27-2025	05-08-2025	0.11	UJ	0.11
Van Buren Avenue	05-08-2025	06-05-2025	**0.47**	J	0.14
Van Buren Avenue	06-05-2025	06-26-2025	0.10	UJ	0.16
Boundary Locations					
Atomic City	03-27-2025	05-01-2025	0.04	UJ	0.07
Atomic City	05-01-2025	05-30-2025	**0.45**	J	0.10
Atomic City	05-30-2025	06-26-2025	-0.05	UJ	0.15
Howe	03-27-2025	05-01-2025	0.27	UJ	0.10
Howe	05-01-2025	05-22-2025	0.25	UJ	0.10
Howe	05-22-2025	06-26-2025	0.08	UJ	0.08
Mud Lake	03-27-2025	05-01-2025	0.04	UJ	0.07
Mud Lake	05-01-2025	05-22-2025	0.23	UJ	0.11
Mud Lake	05-22-2025	06-26-2025	-0.04	UJ	0.09
Monteview	03-27-2025	05-08-2025	0.04	UJ	0.08
Monteview	05-08-2025	06-05-2025	**0.52**	J	0.11
Monteview	06-05-2025	06-26-2025	0.06	UJ	0.12
Distant Locations					
Craters of the Moon	03-27-2025	05-08-2025	0.04	UJ	0.07
Craters of the Moon	05-08-2025	06-26-2025	-0.15	UJ	0.09
Fort Hall[1]	03-27-2025	05-01-2025	0.23	UJ	0.12
Fort Hall	05-01-2025	05-22-2025	0.11	UJ	0.11
Fort Hall	05-22-2025	06-26-2025	**0.58**	J	0.12
Idaho Falls	03-27-2025	04-24-2025	**0.09**	-	0.03

Idaho Falls	04-24-2025	05-22-2025	0.06	UJ	0.11
Idaho Falls	05-22-2025	06-12-2025	0.28	UJ	0.11
Idaho Falls	06-12-2026	06-26-2025	0.19	UJ	0.13

Note: Concentrations are reported in pCi/m^3 with associated uncertainty (1 SD). **Bold** concentrations are positive detections, greater than or equal to 3 SD.
Data qualifiers: J = estimate, R = rejected, U=undetected.
[1] Station operated by Shoshone-Bannock Tribes..
[2] Materials and Fuels Complex.

Table 8. Tritium and Cesium-137 concentrations in precipitation, second quarter 2025.

Station Location	Start Date	Stop Date	Tritium			Cs-137		
			Concentration		1 SD	Concentration		1 SD
On-site Locations								
Big Lost River Rest Area	03-27-2025	05-15-2025	10	U	30	1.6	U	0.7
Big Lost River Rest Area[1]	05-15-2025	06-26-2025	-	-	-	-	-	-
Boundary Locations								
Atomic City	03-27-2025	05-15-2025	0	U	30	1.0	U	0.7
Atomic City	05-15-2025	06-26-2025	**70**	-	20	0.2	U	0.5
Howe	03-27-2025	05-15-2025	0	U	30	0.8	U	0.6
Howe[1]	05-15-2025	06-26-2025	-	-	-	-	-	-
Mud Lake	03-27-2025	06-26-2025	50	U	30	0.2	U	0.7
Monteview	03-27-2025	06-26-2025	70	U	30	-0.2	U	0.8
Distant Locations								
Idaho Falls	03-27-2025	05-15-2025	30	U	30	-0.4	U	0.6
Idaho Falls	05-15-2025	06-26-2025	60	U	30	0.9	U	0.8

Concentrations are reported in pCi/L with associated uncertainty (1 SD). **Bold** concentrations are positive detections, greater than or equal to 3 SD.
Data qualifiers: J = estimate, R = rejected, U=undetected.
[1]Sampling continued through the end of the quarter at these stations, but at that time there was either no precipitation in our jugs or an insufficient amount to justify submitting samples for analysis.

Environmental Radiation Monitoring Results

The DEQ-INL OP operated 11 real-time environmental radiation monitoring stations during the second quarter of 2025 (**Figure 1**). To detect gamma radiation, each station is equipped with an EcoGamma gamma radiation monitor featuring both low- and high-range Geiger–Müller detectors, along with triplicate electret ionization chambers (EICs). (**Table 9**).

The Shoshone-Bannock Tribes operate an air monitoring station at Fort Hall, which is also equipped with an EcoGamma and EICs—both owned and operated by the DEQ-INL OP. The DEQ-INL OP reports these results as a distant site.

The EcoGammas provide real-time measurements and are sensitive enough to detect small changes in gamma radiation levels. The EcoGamma data from each location are transmitted to the DEQ-INL OP and are presented graphically on the DEQ website: https://www.deq.idaho.gov/idaho-national-laboratory-oversight/inl-oversight-program/gamma-radiation-measurements. Historically, DEQ-INL OP used high-pressure ion chambers (HPICs) for real-time gamma radiation monitoring. The transition from HPICs to EcoGammas at all monitoring stations was completed in the first quarter of 2022. Slight differences between EcoGamma and historical HPIC data are expected.

EICs are passive-integrating devices that provide cumulative measurements of environmental gamma radiation exposure. They are deployed, collected, and analyzed quarterly. EICs offer an economical method for monitoring gamma radiation across wide areas, particularly in regions without a power supply. They can also deliver critical gamma radiation data during emergencies. For these reasons, DEQ-INL OP has deployed EICs at 67 locations in a broad network around the INL (**Figure 1**) to measure external radiation. These data are presented in **Appendix B.**

DEQ-INL OP uses both EcoGammas and EICs to monitor external gamma radiation for a variety of radiological objectives. **Table 10** presents the average, median, and range of radiation exposure rates measured by EcoGammas during the second quarter of 2025. **Table 11** presents the EIC monitoring results for the same period. Overall, exposure rates remained within the historical background radiation range observed by DEQ-INL OP.

Table 9. Summary of radiation detection instruments at real-time radiation monitoring stations and air monitoring stations.

Station Location	Instrument Type	
	EcoGamma	EIC
On-site Locations		
Base of Howe	■	■
Big Lost River Rest Area	■	■
Experimental Field Station		■
MFC Guard House		Note[1]
Rover	■	■
Sand Dunes Tower	■	■
Van Buren Avenue		■
Boundary Locations		
Atomic City	■	■
Howe Met Tower	■	■
Monteview	■	■
Mud Lake/Terreton	■	■
Distant Locations		
Big Southern Butte	■	■
Craters of the Moon		■
Fort Hall	■	■
Idaho Falls	■	■

[1]MFC – Materials and Fuels Complex. MFC Guard House is a relatively new monitoring location. Air monitoring data collection began here during the week of 5/16 - 5/23/24. EIC data collection will begin during the third quarter of 2025.

Table 10. Average, median, and range of gamma exposure rates, second quarter 2025, from EcoGamma measurements.

Station Location	Exposure Rate (µR/hr)			
	Quarterly Average*	1 SD	Median	Range**
On-site Locations				
Base of Howe	13.6	0.6	13.6	9.9 – 19.8
Big Lost River Rest Area	14.3	0.8	14.3	11.2 – 20.9
Rover[1]	14.7	0.6	14.7	11.7 – 20.6
Sand Dunes Tower	13.9	0.6	13.9	10.0 – 19.8
Boundary Locations				
Atomic City	13.6	0.7	13.5	9.3 – 20.0
Howe Met. Tower[2]	13.1	0.6	13.1	10.1 – 18.0
Monteview	13.1	0.6	13.1	10.8 – 18.0
Mud Lake / Terreton	12.7	0.6	12.7	8.9 – 20.9
Distant Locations				
Big Southern Butte[3]	14.3	0.6	14.3	11.3 – 19.0
Fort Hall	12.2	0.6	12.2	9.6 – 17.4
Idaho Falls	11.5	0.6	11.5	9.5 – 15.9

*EcoGammas are sensitive electronic devices that can experience intermittent malfunctions and/or interference; this typically results in characteristic positive and/or negative data spikes. These aberrations are removed from the data set based on the judgement of the data analyst.

**The range of background exposure rates from EcoGamma data collected to date is approximately 7 – 34 µR/hr.

[1]No valid data at Rover 5/8 – 5/22/25 and then 6/8 – 6/21/25 due to mechanical failure.

[2]No valid data at Howe Met. Tower 4/10 – 4/15/25 and then 4/21 – 6/9/25 due to mechanical failure.

[3]No valid data at Big Southern Butte 5/25 – 5/29/25. Out of service for maintenance.

Table 11. Electret ionization chamber (EIC) cumulative average exposure rates, second quarter, 2025.

Station Location	Exposure Rate (µR/hr)	
	Quarterly Average[1]	± 1 SD
On-Site Locations		
Base of Howe	13.5	1.5
Big Lost River Rest Area	13.8	2.0
Experimental Field Station	14.1	1.5
MFC (EBR II)[2]	13.3	2.0
Rover	13.9	1.1
Sand Dunes Tower	18.4	0.5
Van Buren Avenue	11.9	0.8
Boundary Locations		
Atomic City	12.6	2.0
Howe Met. Tower	13.4	1.3
Monteview	11.2	1.6
Mud Lake/ Terreton	15.0	2.2
Distant Locations		
Big Southern Butte	15.0	0.8
Craters of the Moon	15.4	2.8
Fort Hall	11.7	1.3
Idaho Falls	9.2	0.9

[1]Results are the average of triplicate exposure rate measurements with the associated sample variability (±1 SD), or the 2 measured exposure rates remaining after removal of an outlying value. One of the triplicate measurements is rejected if it is outside the average of the triplicate measurements ±2 SD of the historical population variability. Typically, the two most consistent measurements are reported, based on judgment of the data analyst.
[2]Nearest existing EIC triplicate location to new MFC Guard House air monitoring station. EIC data collection at the MFC Guard House air monitoring station will begin during the third quarter of 2025.

Water Monitoring Results

DEQ-INL OP collects groundwater samples from wells and springs located within, upgradient of, and downgradient of the INL to evaluate the effects of INL contaminants on water quality in the eastern Snake River Plain (ESRP) aquifer and verify the results of DOE and USGS monitoring. Each year, DEQ-INL OP samples approximately 85-90 locations concurrently with a DOE contractor or the USGS and 15-20 locations independently. Co-sampled locations are primarily on or near the INL Site and are usually sampled during the second and fourth calendar quarters. DEQ-INL OP publishes a comparison of its own analytical results with those obtained by co-samplers in the DEQ-INL Oversight Program Annual Report. Locations sampled independently by DEQ-INL OP are mostly in the Magic Valley and are typically sampled during the third calendar quarter.

Most water samples are collected from wells drilled into the aquifer or springs formed by the intersection of the aquifer water table with the surface. Each aquifer well or spring is categorized as upgradient, facility, boundary, or distant based on its location (**Figure 2** and **Figure 3**):

- *Upgradient* sites are situated north or northeast of INL facilities in areas that have not been affected by INL operations. They are used to monitor background concentrations in the aquifer.

- *Facility* sites are located near facility complexes within the INL, including the Advanced Test Reactor complex (ATR), the Central Facilities Area (CFA), the Idaho Nuclear Technology and

Engineering Center (INTEC), the Materials and Fuels Complex (MFC), the Naval Reactors Facility (NRF), the Radioactive Waste Management Complex (RWMC), and Test Area North (TAN). Facility sites are located within or immediately downgradient of known areas of contamination and are sampled to monitor the concentrations and migration of specific contaminants.

- *Boundary* sites are located near the southern boundary of the INL, downgradient of potential sources of INL contamination. These include several wells equipped with Westbay Multilevel Groundwater Monitoring Systems ("Westbay wells"), which offer a look at the vertical distribution of constituents in the aquifer.

- *Distant* sites are located farther downgradient of the INL, primarily in the Magic Valley, and include wells and springs used for agricultural, municipal, domestic, and industrial purposes.

A small number of samples are also collected each year from streams, waste-pond effluent, and wells drilled into perched groundwater (groundwater that sits above the aquifer).

Samples collected from water-monitoring sites are analyzed for radiological and non-radiological constituents, many of which are present in the aquifer both naturally and as a result of INL operations. All locations are sampled for gross alpha and gross beta radioactivity, manmade gamma-emitting nuclides, tritium, chloride, sulfate, alkalinity, chromium, and nitrate-plus-nitrite.[6] Samples from locations at which tritium concentrations are too low to be detected by the standard method are re-analyzed for tritium using an electrolytic enrichment method (referred to as the low-level method), which has a minimum detectable concentration (MDC) about ten times lower than the standard method. Selected sites are also sampled for specific radionuclides—including uranium isotopes (^{234}U, ^{235}U, and ^{238}U), plutonium isotopes (^{238}Pu, $^{239/240}$Pu), americium-241 (^{241}Am), strontium-90 (^{90}Sr), iodine-129 (^{129}I) and technetium-99 (^{99}Tc)—selected trace metals, common ions, total phosphorous, and/or volatile organic compounds (VOCs) based on past and present INL operations or a history of elevated concentrations. If unexpected levels of radioactivity are detected in gross measurements, additional samples will be collected and analyzed for specific radionuclides.

During the second quarter of 2025, DEQ-INL OP sampled groundwater from the aquifer at 29 facility, 15 boundary, seven distant, and five upgradient locations. DEQ-INL OP also sampled water from two perched water well locations. **Table 12** lists the sample date, co-sampler, well depth, and analyses requested for the locations sampled this quarter. Analytical results are reported in **Tables 14** through **24** and summarized below. The results of low-level tritium analyses are reported in **Table 16** and discussed below. A backlog of 7 low-level tritium analyses remain for samples taken during the second quarter of 2025.

Table 13 shows the range of background concentrations for each constituent in the ESRP aquifer and the EPA drinking water maximum contaminant level (MCL) or secondary maximum contaminant level (SMCL). Background concentrations depend on local geology, and the concentrations of constituents at sites not influenced by INL activities may on occasion be higher than the given background ranges due to local factors and natural variability.

[6] Distant locations Alpheus Spring, Bill Jones Hatchery, Clear Spring, Minidoka Water Supply, and Shoshone Water Supply and upgradient location Mud Lake Water Supply are sampled for gross alpha and gross beta radioactivity, gamma-emitting radionuclides, and tritium during the second quarter. In the fourth quarter, common ions, metals, nitrate-plus-nitrate, and other constituents are collected along with gross alpha and gross beta radioactivity, gamma-emitting radionuclides, and tritium.

Gross alpha and gross beta radioactivity

Gross alpha and gross beta analyses are used to screen for unexpectedly high levels of radioactivity in samples. DEQ-INL OP has determined from past sampling that background concentration ranges for gross alpha and gross beta radioactivity in the ESRP aquifer are approximately 0-5.6 pCi/L and 0-8.6 pCi/L, respectively. Occasional measurements of concentrations above these background ranges in uncontaminated samples are statistically probable due to uncertainties inherent in measuring low levels of radioactivity. Additionally, some samples will have levels of radioactivity slightly higher than background ranges due to higher-than-average concentrations of naturally occurring uranium, thorium, or potassium-40.

Gross alpha and beta radioactivity were detected at low levels in most samples (**Table 14**). Gross alpha radioactivity was measured within background ranges at all locations. TAN-28, an aquifer well located at the Test Area North (TAN) facility, had the greatest gross alpha activity; measured at a concentration of 3.6 ± 0.9 pCi/L.

Gross beta activity was measured above background at TAN, INTEC, and ATR. TAN-2336 exhibited the maximum gross beta activity this quarter at 688.9 ± 27.6 pCi/L. Bioremediation efforts are ongoing at the TAN facility, and it is hypothesized that these remediation efforts are mobilizing known ^{90}Sr contamination in the aquifer. Because ^{90}Sr is a beta emitter, its presence increases the gross beta count. TAN-2336 also had the highest ^{90}Sr concentration this quarter. TAN-2271, TAN-28 and TAN-29 also exhibited elevated gross beta concentrations. USGS-052 displayed the highest gross beta concentration at the INTEC facility at 217.2 ± 1.7 pCi/L. This location has known ^{99}Tc contamination and the gross beta concentration detected at this well is within the historical range. The perched aquifer below the ATR facility has known contamination resulting from former disposal wells and percolation ponds. USGS-068 had a gross beta concentration in the perched aquifer at 16.5 ± 0.8 pCi/L, which is within historical ranges.

Manmade gamma-emitting radionuclides

TAN-2336 was the only location where cesium-137 (^{137}Cs) was detected. Results were 8.2 ± 0.7 pCi/L. Ongoing in-situ bioremediation (ISB) for VOCs at the TAN facility cause cation concentrations (calcium, magnesium, sodium, and potassium) to increase. The increase in cations elevates ^{137}Cs and ^{90}Sr concentrations because they are all competing for sorption sites in the aquifer. As cation concentrations decrease, it is expected that ^{137}Cs and ^{90}Sr concentrations will also decrease. Results for ^{137}Cs, the manmade gamma-emitter most likely to be detected in groundwater, are reported in **Table 14**.

Tritium

Tritium was analyzed at all locations sampled this quarter (**Table 15**). Tritium was detected at 14 facility and 4 boundary wells using the standard analytical method. Detected tritium concentrations at the facility wells ranged from 1475 ± 50 pCi/L at CFA-1 to 189 ± 35 pCi/L at TAN-2336. Tritium concentrations detected in the boundary wells ranged from 561 ± 40 pCi/L at USGS-131A (616 ft bgs) to 133 ± 35 pCi/L at Middle-2051 (749 ft bgs). Tritium was not detected in perched water wells using the standard analytical method this quarter.

Low-level tritium analysis was performed on seven facility wells, two upgradient wells, seven boundary wells, two distant, and two perched water wells. Due to laboratory instrumentation and analytical errors, all low-level tritium analyses this quarter have been flagged as estimates (J). The results are reported in **Table 16**. Detections occurred at five facility locations, ranging from 65 ± 2 pCi/L at RWMC

well A11A31 to 6 ± 2 pCi/L at M6S. Seven detections at boundary locations were recorded in this quarter, with the highest value at USGS-132 (125 ± 3 pCi/L). Two perched groundwater locations exhibited low-level tritium concentrations of 43 ± 2 pCi/L at USGS-068 and 17 ± 2 pCi/L at USGS-062. Low-level tritium was not detected in the upgradient locations.

All tritium concentrations were consistent with historical data and were well below the drinking water MCL of 20,000 pCi/L.

Strontium-90

Thirteen aquifer locations and two perched groundwater locations were sampled for ^{90}Sr this quarter (**Table 17**). Detectable concentrations were found in nine aquifer samples at TAN, INTEC, and CFA, with a maximum concentration of 319 ± 14 pCi/L at TAN-2336. Detectable concentrations were found in one ATR perched groundwater sample, with a concentration of 5.87 ± 0.66 pCi/L at USGS-068. Six locations had ^{90}Sr concentrations that exceeded the MCL of 8 pCi/L. All elevated concentrations were measured in samples from areas of known contamination and are consistent with historical trends.

Technetium-99

Five facility locations at TAN, INTEC and CFA were sampled for ^{99}Tc (**Table 18**). INTEC well USGS-052 had the greatest concentration this quarter at 446 ± 22 pCi/L. All wells with detections of ^{99}Tc were downgradient of known contamination sources at INTEC facility.

Plutonium Isotopes

Six facility wells were sampled for plutonium isotopes (^{238}Pu and $^{239/240}Pu$) this quarter, resulting in non-detections for ^{238}Pu and $^{239/240}Pu$ (**Table 19**).

Americium-241

Four facility locations at RWMC and ATR were sampled for Americium-241(^{241}Am) this quarter. All sample results were non-detections (**Table 19**).

Uranium Isotopes

Eleven facility wells from INTEC, TAN and RWMC were sampled for uranium isotopes this quarter (**Table 20**). Ten wells yielded detectable results for ^{234}U. The highest concentrations were from TAN-29 at 5.06 ± 0.26 pCi/L and TAN-28 at 3.52 ± 0.18 pCi/L. Both values were within historical ranges. Detectable concentrations of ^{235}U were found in three wells: TAN-28 at 0.147 ± 0.025 pCi/L, TAN-29 at 0.144 ± 0.030 pCi/L and USGS-067 at 0.0835 ± 0.0234 pCi/L. Ten wells had detections of ^{238}U this quarter, with the greatest concentration of 0.975 ± 0.078 pCi/L at TAN-29. No wells exceed the total uranium MCL of 30 µg/L.

Common ions, trace metals, and nutrients

Select locations were sampled for common ions (calcium, magnesium, sodium, potassium, chloride, sulfate, and alkalinity), trace metals, (arsenic, barium, chromium, iron, lead, and manganese.) and dissolved nutrients (nitrate-plus-nitrite, phosphorus) (**Tables 21, 22, and 23**).

The highest concentrations of chloride were measured at NRF, TAN, and RWMC. NRF-06 had the highest overall concentration at 405 mg/L, which exceed the EPA's secondary MCL of 250 mg/L. TAN-28, TAN-29, and TAN-2271 also exceeded background levels of chloride, with the highest at TAN-2271 (98.7 mg/L). RWMC well M15S exceeded background levels at 78.8 mg/L.

ATR perched water well USGS-068 had the highest concentration of sulfate at 284 mg/L, followed by ATR perched water well USGS-062 at 192 mg/L. Concentrations of barium, arsenic, iron, lead, magnesium, calcium, manganese, sodium, sulfate, alkalinity, potassium, and phosphorous in samples from TAN were elevated above background likely due to ISB conditions, with TAN-2336 usually measuring the highest concentrations.

TAN-2336 displayed the highest chromium value this quarter, at 460 µg/L. The elevated result is likely the remobilization of chromium due to bioremediation injections. USGS-065 displayed a chromium concentration above the MCL (100 µg/L) at 110 µg/L, which is the highest value since 2004. Chromium concentrations have previously remained below the MCL since 2007, and recent analyses showed no indication of an upward trend in chromium concentrations. USGS-065 will continue to be monitored annually to see if an increasing trend develops. The highest chromium value for perched groundwater wells was 65 µg/L at USGS-068 located near the ATR facility, which is within the expected range for this location. Most boundary wells sampled this quarter measured chromium values slightly greater than the background range, with the highest value of 11µg/L at USGS-131A (616 ft bgs).

Consistent with historical data, the highest arsenic levels were observed at TAN-2336 (46 µg/L) and at ATR perched groundwater well USGS-062 (9.2 µg/L). All other concentrations were consistent with past observations and within natural background ranges.

All nutrient results were below the MCLs for this quarter. The highest nitrate + nitrite concentration was 9.0 mg/L at perched groundwater well USGS-068 (ATR), which is consistent with historical values. One sample at TAN-2336 had elevated levels of phosphorus with 48 mg/L, which is likely a direct result of bioremediation activity. All other concentrations were consistent with past observations and trends with most within natural background ranges.

Volatile organic compounds (VOCs)

VOCs were measured at 10 TAN wells and six RWMC wells (**Table 24**). All locations had detectable concentrations of at least one VOC, except for RWMC well M1S and TAN well TAN-2312. Carbon tetrachloride, trichloroethene (TCE), and chloroform continue to be detected at RWMC wells at levels consistent with previous observations. For the first time, dichlorodifluoromethane concentrations (1.33 µg/L) were detected at USGS-087. Sampling of this well will continue to monitor concentrations and evaluate future trends.

TAN-2336 displayed a methyl ethyl ketone (MEK, 2-butanone) concentration at 3430 µg /L, which is the highest detection at this location. Detections of MEK most likely represent a side reaction in the bioremediation process and are generally short-lived with a degradation time ranging from 13-128 days (Aronson, Dallas B., and Philip H. Howard. "Anaerobic Biodegradation of Organic Chemicals in Groundwater: A Summary of Field and Laboratory Studies," 1997). Due to its short-lived nature, there is no immediate threat to human health and the environment. Propionitrile concentrations (31.6 µg/L) were detected for the first time at TAN-2336. This analyte will be closely monitored as remediation continues. Tetrachloroethene (PCE), trichloroethene (TCE), trans-1, 2-dichloroethene (trans-1, 2-DCE) and cis-1,2-dichloroethene (cis-1, 2-DCE) continue to be detected at TAN wells; however, notable MCL exceedances and/or changes from previous measurements include:

- TAN-2271: Trans-1,2-DCE = 96.8 µg/L, up from 54.5 µg/L in 2024 (MCL is 100 µg/L)
- TAN-29: TCE = 604 µg/L, up from 326 µg/L in 2024 (MCL is 5 µg/L). This is the highest concentration since 2016.
- TAN-51 TCE = 222 µg/L down from 242 in 2024 (MCL is 5 µg/L)
- TAN-42: TCE = 48.4 µg/L, down from 124 µg/L in 2024 (MCL is 5 µg/L)
- TAN-42: PCE = 6.34 µg/L, down from 11.2 µg/L in 2024 (MCL is 5 µg/L)
- M15S: Carbon Tetrachloride = 7.21 up from 6.01 in 2024 (MCL is 5 µg/L)

All other VOC detections were consistent with historical data and were measured in areas of known contamination.

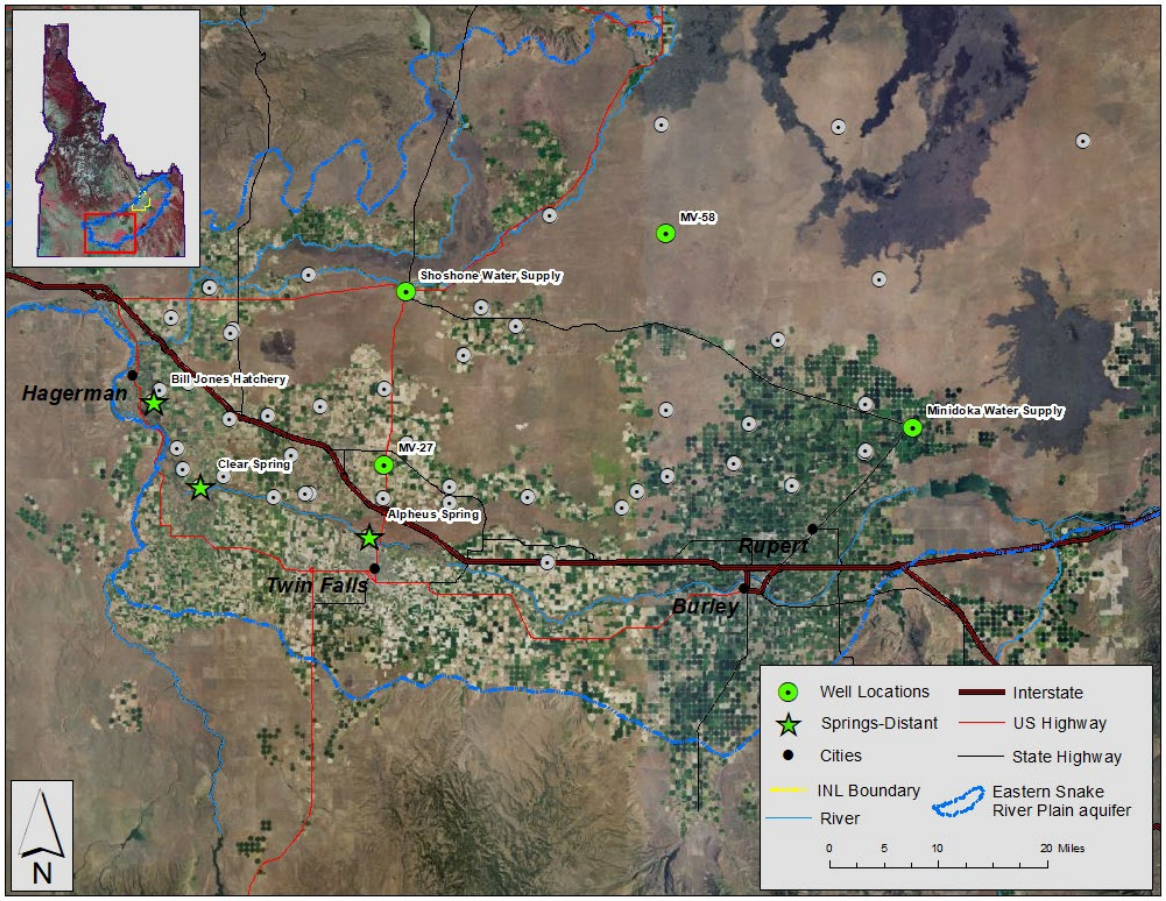

Figure 2. Distant water monitoring locations.

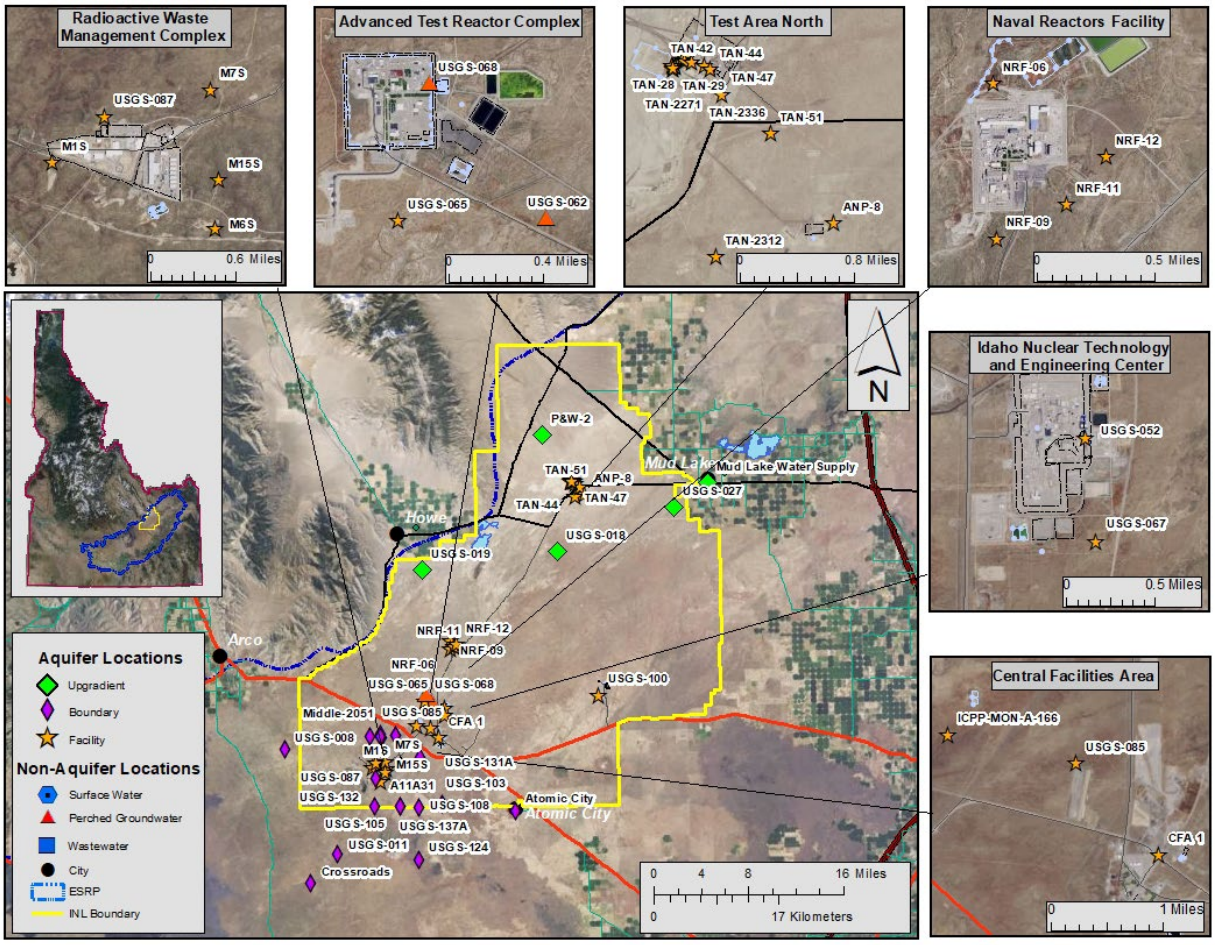

Figure 3. Upgradient, facility, boundary, perched groundwater (GW), surface water and wastewater monitoring locations.

Table 12. Locations sampled in water, second quarter, 2025.

Sample Location	Date Sampled	Co-Sampler	Well Depth (ft bgs)	Analyses*
Aquifer Samples				
Boundary				
Crossroads	04/07/25	USGS	796	α, β, γ, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
USGS-008	04/07/25	USGS	812	α, β, γ, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
USGS-011	04/08/25	USGS	704	α, β, γ, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
USGS-124	04/08/25	USGS	800	α, β, γ, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
Atomic City	05/06/25	n/a	639	α, β, γ, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
USGS-103	06/12/25	USGS	1258	α, β, γ, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
USGS-131A (616 ft bgs)	06/16/25	USGS	616	α, β, γ, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
USGS-131A (812 ft bgs)	06/16/25	USGS	812	α, β, γ, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
USGS-132	06/18/25	USGS	765	α, β, γ, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
USGS-137A	06/23/25	USGS	747	α, β, γ, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
USGS-105 (1072 ft bgs)	06/24/25	USGS	1072	α, β, γ, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
USGS-105 (952 ft bgs)	06/24/25	USGS	952	α, β, γ, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
Middle-2051 (1091 ft bgs)	06/25/25	USGS	1091	α, β, γ, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
Middle-2051 (749 ft bgs)	06/25/25	USGS	749	α, β, γ, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
USGS-108	06/26/25	USGS	1172	α, β, γ, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
Distant				
Bill Jones Hatchery	05/12/25	BEA	-	α, β, γ, ^{3}H
Clear Spring	05/12/25	BEA	-	α, β, γ, ^{3}H
Minidoka Water Supply	05/12/25	BEA	-	α, β, γ, ^{3}H
Shoshone Water Supply	05/12/25	BEA	-	α, β, γ, ^{3}H
Alpheus Spring	05/12/25	BEA	-	α, β, γ, ^{3}H
MV-27	05/29/25	-	-	α, β, γ, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
MV-58	05/29/25	-	-	α, β, γ, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
Facility				
Advanced Test Reactor Complex				
USGS-065	04/14/25	USGS	498	α, β, γ, ^{3}H, ^{241}Am, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
Central Facilities Area				
USGS-085	04/03/25	USGS	614	α, β, γ, ^{90}Sr, ^{99}Tc, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
CFA 1	04/10/25	USGS	639	α, β, γ, ^{99}Tc, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
ICPP-MON-A-166	04/14/25	USGS	527	α, β, γ, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
Idaho Nuclear Technology and Engineering Center				
USGS-052	04/01/25	IEC	500	α, β, γ, Pu iso., U iso., ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
USGS-067	04/01/25	IEC	516	α, β, γ, Pu iso., U iso., ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
Materials and Fuels Complex				
USGS-100	04/10/25	USGS	750	α, β, γ, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
Naval Reactors Facility				

NRF-06	05/19/25	USGS	417	α, β, γ, ^{90}Sr, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
NRF-09	05/20/25	USGS	422	α, β, γ, ^{90}Sr, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
NRF-11	05/20/25	USGS	417	α, β, γ, ^{90}Sr, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
NRF-12	05/20/25	USGS	421	α, β, γ, ^{90}Sr, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
Radioactive Waste Management Complex				
USGS-087	04/07/25	USGS	673	α, β, γ, U iso., Pu iso., ^{241}Am, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$, VOCs
A11A31	05/05/25	IEC	667	α, β, γ, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$, VOCs
M6S	05/05/25	IEC	657	α, β, γ, U iso., Pu iso., ^{241}Am, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$, VOCs
M7S	05/06/25	IEC	615	α, β, γ, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$, VOCs
M15S	05/06/25	IEC	604	α, β, γ, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$, VOCs
M1S	05/06/25	IEC	636	α, β, γ, U iso., Pu iso., ^{241}Am, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$, VOCs
Test Area North				
TAN-28	04/15/25	IEC	240	α, β, γ, ^{90}Sr, U iso., ^{3}H, Cl, com. ions, trace metals, Cr, $NO_3^- + NO_2^-$, VOCs
TAN-29	04/15/25	IEC	243	α, β, γ, ^{90}Sr, U iso., ^{3}H, Cl, com. ions, trace metals, $NO_3^- + NO_2^-$, VOCs
TAN-42	04/15/25	IEC	268	α, β, γ, ^{90}Sr, U iso., ^{3}H, Cl, com. ions, trace metals, $NO_3^- + NO_2^-$, P, VOCs
TAN-44	04/15/25	IEC	295	α, β, γ, U iso., ^{3}H, Cl, SO_4^{2-}, Alkalinity, trace metals, $NO_3^- + NO_2^-$, VOCs
TAN-2336	04/16/25	IEC	238	α, β, γ, ^{90}Sr, U iso., ^{3}H, Cl, com. ions, trace metals, $NO_3^- + NO_2^-$, P, VOCs
TAN 2271	04/16/25	IEC	252	α, β, γ, ^{90}Sr, ^{3}H, Cl, com. ions, trace metals, Cr, $NO_3^- + NO_2^-$, VOCs
TAN-2312	06/09/25	IEC	339	α, β, γ, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$, VOCs
ANP-8	06/09/25	IEC	268	α, β, γ, ^{3}H, Cl, SO_4^{2-}, Alkalinity, trace metals, $NO_3^- + NO_2^-$, VOCs
TAN-47	06/09/25	IEC	270	α, β, γ, Pu iso., U iso., ^{90}Sr, ^{99}Tc, ^{3}H, Cl, com. ions, Cr, $NO_3^- + NO_2^-$, VOCs
TAN-51	06/10/25	IEC	413	α, β, γ, ^{3}H, Cl, SO_4^{2-}, trace metals, $NO_3^- + NO_2^-$, VOCs
Upgradient				
USGS-018	04/14/25	USGS	329	α, β, γ, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
USGS-019	04/21/25	USGS	400	α, β, γ, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
USGS-027	04/21/25	USGS	312	α, β, γ, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
P&W-2	04/21/25	USGS	378	α, β, γ, ^{3}H, Cl, SO_4^{2-}, Alkalinity, Cr, $NO_3^- + NO_2^-$
Mud Lake Water Supply	05/13/25	BEA	-	α, β, γ, ^{3}H
Other Samples				
Perched Groundwater				
Advanced Test Reactor Complex				
USGS-062	04/09/25	USGS	165	α, β, γ, ^{90}Sr, ^{3}H, Cl, SO_4^{2-}, Alkalinity, trace metals, $NO_3^- + NO_2^-$
USGS-068	04/09/25	USGS	128	α, β, γ, ^{90}Sr, ^{3}H, Cl, com. ions, Cr, $NO_3^- + NO_2^-$

ft bgs = feet below ground surface.
*α = gross alpha radioactivity; β = gross beta radioactivity; γ = manmade gamma-emitting radionuclides; ^{3}H = tritium; ^{90}Sr = Strontium-90, ^{99}Tc = Technetium-99, Pu iso. = plutonium isotopes ^{238}Pu, $^{239/240}$ Pu, Pu; U iso. = uranium isotopes ^{234}U, ^{235}U, ^{238}U; Cl = chloride; SO_4^{2-} = sulfate; com. ions = Ca^{2+}, Mg^{2+}, Na^+, K^+, Cl^-, SO_4^{2-}, alkalinity; Cr = chromium; trace metals = arsenic (As), barium (Ba), chromium (Cr), iron (Fe), manganese (Mn), lead (Pb), selenium (Se); NO_3+NO_2 = nitrate plus nitrite; P = phosphorus; and VOCs (volatile organic compounds).
n/a = well depth not available.

Table 13. Constituent background concentration ranges and EPA drinking water standards.

Constituent	Background[1]	MCL or SMCL[2]
Radiological Constituents (pCi/L)		
Gross alpha	0-5.6[a]	15
Gross beta	0-8.6[a]	4 mrem/yr
Cesium-137	0	200
Tritium	0-33[a]	20,000
Strontium-90	0	8
Technetium-99	0	900
Iodine-129	0.0000054[e]	1
Uranium-234	0.043-1.9[b]	30 µg/L (total U)
Uranium-235	0-0.048[b]	
Uranium-238	0.021-0.719[b]	
Plutonium-238	0	15[g]
Plutonium-239/240	0	15[g]
Americium-241	0	15[g]
Non-radiological Constituents		
Common Ions (mg/L)		
Alkalinity (as $CaCO_3$)	91-261[a]	---
Calcium	23 – 71[a]	---
Chloride	4.9 – 66.6[a]	250*
Fluoride	0.1 – 1.50[a]	4
Magnesium	10.1 – 27.4[a]	---
Potassium	1.2 – 5.8[a]	---
Sodium	2.6 – 27.0[a]	---
Sulfate	9.6 – 40.4[a]	250*
Trace Metals (µg/L)		
Arsenic	2 – 3[c]	10
Barium	50 – 70[c]	2000
Chromium	<1.0 – 5.2[a]	100
Iron	4 – 16[d]	300*
Lead	<5[c]	15
Manganese	<1 – 4[a]	50*
Selenium	<1[c]	50
Zinc	<3 – 10.5[d]	5000*
Nutrients (mg/L)		
Nitrate plus nitrite	<0.04 – 3.59[b]	10 for NO_3^-, 1 for NO_2^-
Phosphorus	<0.01 – 0.02[d]	---
Volatile Organic Compounds (µg/L)		
Tetrachloroethene (PCE)	0	5
Trichloroethene (TCE)	0	5
1,1-Dichloroethene	0	7
cis-1,2-dichloroethene	0	70
trans-1,2-dichloroethene	0	100
Vinyl chloride	0	2
Carbon tetrachloride	0	5
Chloroform	0	80[f]
Chloromethane	0	---
Methylene Chloride	0	5
Methyl Ethyl Ketone	0	---
1,1-Dichloroethane	0	---

[1] Sources for background ranges are: [a] DEQ data compiled from distant, boundary, and surface water sites from 1993-2018; [b] Bartholomay and Hall, 2016 (DOE/ID-22237); [c] Knobel and others, 1992; [d] Knobel and others, 1999 (DOE/ID-22164). [e] The actual background of I-129 in the aquifer from atmospheric deposition and rock weathering is 0.0000054 pCi/L per Cecil and others, 2003 (DOE/ID-22186); [f] MCL is for total trihalomethanes. [g] There are no specific MCLs for these nuclides. Listed MCLs are the gross alpha activity MCL. [2] Maximum Contaminant Levels (MCLs) are the highest levels of contaminants legally allowed in public drinking water systems in Idaho. Most wells sampled by DEQ-INL OP are not used for drinking water. A * designates a Secondary MCL (SMCL), which is a guideline recommended by the EPA for constituents that may affect the taste, color, or odor of drinking water.

Table 14. Gross alpha, gross beta, and man-made gamma-emitting radionuclide concentrations (pCi/L) in water samples, second quarter, 2025.

Sample Location	Sample Date	Gross Alpha			Gross Beta			Cesium-137*		
		Result		1 SD	Result		1 SD	Result		1 SD
Aquifer Samples										
Boundary										
Crossroads	04/07/25	0.1	U	0.3	**2.0**	-	0.4	0.5	U	0.7
USGS-008	04/07/25	**1.6**	-	0.4	**1.9**	-	0.4	-0.2	U	0.6
USGS-011	04/08/25	0.6	U	0.3	**2.0**	-	0.4	0.5	U	0.5
USGS-124	04/08/25	0.6	U	0.4	**2.1**	-	0.4	-0.7	U	0.6
Atomic City	05/06/25	**1.5**	-	0.4	**3.1**	-	0.4	0.5	U	0.6
USGS-103	06/12/25	0.7	U	0.4	**3.0**	-	0.4	2.3	U	1.2
USGS-131A (616 ft bgs)	06/16/25	0.5	U	0.3	**3.3**	-	0.4	0.4	U	0.5
USGS-131A (812 ft bgs)	06/16/25	0.7	U	0.4	**3.5**	-	0.4	1.7	U	0.8
USGS-132	06/18/25	1.0	U	0.4	**1.7**	-	0.4	-0.2	U	0.5
USGS-137A (747 ft bgs)	06/23/25	1.0	U	0.4	**2.9**	-	0.4	-0.8	U	0.9
USGS-105 (1072 ft bgs)	06/24/25	0.7	U	0.3	**1.6**	-	0.4	1.2	U	0.7
USGS-105 (952 ft bgs)	06/24/25	1.0	U	0.4	**2.7**	-	0.4	-0.1	U	0.6
Middle-2051 (1091 ft bgs)	06/25/25	0.5	U	0.3	**2.3**	-	0.4	0.1	U	0.5
Middle-2051 (749 ft bgs)	06/25/25	**1.3**	-	0.4	**2.2**	-	0.4	-0.6	U	0.5
USGS-108	06/26/25	0.7	U	0.3	**2.3**	-	0.4	0.9	U	0.8
Distant										
Bill Jones Hatchery	05/12/25	**1.9**	-	0.5	**2.6**	-	0.4	1.0	U	0.8
Clear Spring	05/12/25	**1.4**	-	0.4	**4.5**	-	0.5	0.5	U	0.8
Minidoka Water Supply	05/12/25	**1.7**	-	0.4	**3.9**	-	0.5	-0.5	U	0.7
Shoshone Water Supply	05/12/25	**1.9**	-	0.4	**1.9**	-	0.4	0.3	U	0.5
Alpheus Spring	05/12/25	**1.8**	-	0.5	**7.2**	-	0.5	0.0	U	0.6
MV-27	05/29/25	0.4	U	0.5	**3.7**	-	0.5	0.7	U	0.8
MV-58	05/29/25	0.3	U	0.2	**2.0**	-	0.3	0.1	U	0.6
Facility										
Advanced Test Reactor Complex										
USGS-065	04/14/25	**1.9**	-	0.5	**2.1**	-	0.4	1.3	U	0.9
Central Facilities Area										
USGS-085	04/03/25	-0.5	U	0.4	**3.9**	-	0.4	-0.1	U	0.7
CFA 1	04/10/25	1.3	U	0.5	**5.7**	-	0.5	-0.1	U	0.6
ICPP-MON-A-166	04/14/25	**1.1**	-	0.3	**2.7**	-	0.4	0.4	U	0.6
Idaho Nuclear Technology and Engineering Center										
USGS-052	04/01/25	0.8	U	0.5	**217.1**	-	1.7	1.1	U	0.7
USGS-067	04/01/25	1.2	-	0.4	**57.8**	-	0.9	0.0	U	0.7
Materials and Fuels Complex										
USGS-100	04/10/25	0.7	U	0.4	**2.1**	-	0.4	0.2	U	0.5
Naval Reactors Facility										

Sample Location	Sample Date	Gross Alpha			Gross Beta			Cesium-137*		
		Result		1 SD	Result		1 SD	Result		1 SD
NRF-06	05/19/25	0.7	U	0.9	0.6	U	1.0	-0.2	U	0.6
NRF-09	05/20/25	**1.2**	-	0.5	**3.7**	-	0.5	0.2	U	0.6
NRF-11	05/20/25	**0.8**	U	0.5	1.0	U	0.5	-0.6	U	0.7
NRF-12	05/20/25	0.7	U	0.4	**2.8**	-	0.4	1.4	U	0.7
Radioactive Waste Management Complex										
USGS-087	04/07/25	0.4	U	0.4	**2.6**	-	0.4	0.0	U	0.8
A11A31	05/05/25	**2.0**	-	0.5	**4.4**	-	0.5	0.1	U	0.5
M6S	05/05/25	**1.5**	-	0.4	**2.6**	-	0.4	0.7	U	0.9
M7S	05/06/25	**0.9**	-	0.3	**2.9**	-	0.4	0.2	U	0.6
M15S	05/06/25	0.1	U	0.3	**4.8**	-	0.4	0.8	U	0.5
M1S	05/06/25	**1.5**	-	0.4	**1.7**	-	0.4	-0.8	U	1.0
Test Area North										
TAN-28	04/15/25	**3.6**	-	0.9	**429.1**	-	3.3	0.6	U	0.6
TAN-29	04/15/25	**3.1**	-	0.6	**27.9**	-	0.7	-0.3	U	0.4
TAN-42	04/15/25	**1.5**	-	0.4	**3.2**	-	0.4	0.3	U	0.6
TAN-44	04/15/25	**1.4**	-	0.4	**4.0**	-	0.5	0.1	U	0.5
TAN-2336	04/16/25	-2.6	U	14.7[1]	**688.9**	-	27.6[1]	**8.2**	-	0.7
TAN 2271	04/16/25	1.3	U	0.6	**434.6**	-	3.2	1.5	U	0.7
TAN-2312	06/09/25	**1.4**	-	0.4	**3.4**	-	0.4	0.3	U	0.8
ANP-8	06/09/25	0.6	U	0.4	**3.5**	-	0.4	-0.7	U	0.6
TAN-47	06/09/25	0.3	U	0.4	**2.6**	-	0.4	1.1	U	0.8
TAN-51	06/10/25	**1.4**	-	0.4	**3.6**	-	0.5	0.1	U	0.6
Upgradient										
USGS-018	04/14/25	**1.1**	-	0.4	**1.6**	-	0.4	-0.7	U	1.0
USGS-019	04/21/25	1.2	-	0.4	**1.2**	-	0.4	0.7	U	0.7
USGS-027	04/21/25	**2.3**	-	0.5	**3.9**	-	0.4	0.4	U	0.6
P&W-2	04/21/25	**2.0**	-	0.4	**2.5**	-	0.4	1.0	U	0.9
Mud Lake Water Supply	05/13/25	0.0	U	0.3	**1.4**	-	0.4	0.1	U	1.0
Other Samples										
Perched Groundwater										
Advanced Test Reactor Complex										
USGS-062	04/09/25	**2.3**	-	0.6	**6.4**	-	0.5	2.5	U	1.2
USGS-068	04/09/25	1.5	U	0.6	**16.5**	-	0.8	0.4	U	0.8

Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.

*ISU-EML analyzes water samples for all common manmade gamma-emitting radionuclides. If none are detected, only the results for ^{137}Cs, the manmade gamma-emitter most likely to be detected in groundwater, are reported in this table.

ft bgs = feet below ground surface.

Bold concentrations are positive detections, greater than or equal to 3 SD.

[1]ISU-EML reported that the elevated 1 SD is attributable to the low aliquant of sample (0.010 L) that was required to keep the residual mass within the maximum value of 200 mg for which their mass correction formula is valid.

Table 15. Tritium concentrations (pCi/L) in water samples, second quarter, 2025.

Sample Location	Sample Date	Tritium		
		Result		1 SD
Aquifer Samples				
Boundary				
Crossroads	04/07/25	-31	U	32
USGS-008	04/07/25	-45	U	32
USGS-011	04/08/25	-21	U	33
USGS-124	04/08/25	45	U	37
Atomic City	05/06/25	-28	U	32
USGS-103	06/12/25	64	U	34
USGS-131A (616 ft bgs)	06/16/25	**561**	-	41
USGS-131A (812 ft bgs)	06/16/25	**511**	-	40
USGS-132	06/18/25	78	U	34
USGS-137A	06/23/25	72	U	34
USGS-105 (1072 ft bgs)	06/24/25	**161**	-	36
USGS-105 (952 ft bgs)	06/24/25	79	U	34
Middle-2051 (1091 ft bgs)	06/25/25	58	U	34
Middle-2051 (749 ft bgs)	06/25/25	**133**	-	35
USGS-108	06/26/25	-17	U	33
Distant				
Bill Jones Hatchery	05/12/25	-24	U	32
Clear Spring	05/12/25	-38	U	32
Minidoka Water Supply	05/12/25	-49	U	32
Shoshone Water Supply	05/12/25	-10	U	32
Alpheus Spring	05/12/25	-38	U	32
MV-27	05/29/25	7	U	31
MV-58	05/29/25	27	U	32
Facility				
Advanced Test Reactor Complex				
USGS-065	04/14/25	**958**	-	46
Central Facilities Area				
USGS-085	04/03/25	**432**	-	39
CFA 1	04/10/25	**1475**	-	52
ICPP-MON-A-166	04/14/25	62	U	33
Idaho Nuclear Technology and Engineering Center				
USGS-052	04/01/25	**524**	-	40
USGS-067	04/01/25	**1008**	-	48
Materials and Fuels Complex				
USGS-100	04/10/25	-10	U	32
Naval Reactors Facility				
NRF-06	05/19/25	-3	U	32
NRF-09	05/20/25	-10	U	32
NRF-11	05/20/25	24	U	33

Sample Location	Sample Date	Tritium		
		Result		1 SD
NRF-12	05/20/25	17	U	32
Radioactive Waste Management Complex				
USGS-087	04/07/25	**298**	-	37
A11A31	05/05/25	55	U	33
M6S	05/05/25	-14	U	32
M7S	05/06/25	**318**	-	38
M15S	05/06/25	7	U	33
M1S	05/06/25	10	U	33
Test Area North				
TAN-28	04/15/25	**369**	-	38
TAN-29	04/15/25	**658**	-	42
TAN-42	04/15/25	**241**	-	36
TAN-44	04/15/25	**303**	-	37
TAN-2336	04/16/25	**189**	-	35
TAN 2271	04/16/25	**313**	-	37
TAN-2312	06/09/25	-17	U	32
ANP-8	06/09/25	23	U	32
TAN-47	06/09/25	0	U	31
TAN-51	06/10/25	**206**	-	36
Upgradient				
USGS-018	04/14/25	7	U	32
USGS-019	04/21/25	21	U	32
USGS-027	04/21/25	31	U	35
P&W-2	04/21/25	-44	U	32
Mud Lake Water Supply	05/13/25	-66	U	31
Other Samples				
Perched Groundwater				
Advanced Test Reactor Complex				
USGS-062	04/09/25	17	U	33
USGS-068	04/09/25	69	U	34

Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.
ft bgs = feet below ground surface.
Bold concentrations are positive detections, greater than or equal to 3 SD.

Table 16. Low-level tritium concentrations (pCi/L) in water samples collected during 2025 and analyzed using the electrolytic enrichment method, second quarter, 2025.

Sample Location	Sample Date	Tritium		
		Result		1 SD
Aquifer Samples				
Boundary				
Crossroads	04/07/25	**8**	J	2
USGS-008	04/07/25	**9**	J	2
USGS-011	04/08/25	**15**	J	2
USGS-124	04/08/25	**19**	J	2
Atomic City	05/06/25	**6**	J	2
USGS-103	06/12/25	**94**	J	3
USGS-132	06/18/25	**125**	J	3
Distant				
MV-27	05/29/25	**8**	J	2
MV-58	05/29/25	2	UJ	2
Facility				
Central Facilities Area				
ICPP-MON-A-166	04/14/25	**25**	J	2
Radioactive Waste Management Complex				
A11A31	05/05/25	**65**	J	2
M6S	05/05/25	**6**	J	2
M15S	05/06/25	**41**	J	2
M1S	05/06/25	2	UJ	2
Test Area North				
TAN-2312	06/09/25	-6	UJ	2
ANP-8	06/09/25	**39**	J	2
Upgradient				
USGS-019	04/21/25	-2	UJ	2
USGS-027	04/21/25	0	UJ	2
Other Samples				
Perched Groundwater				
Advanced Test Reactor Complex				
USGS-062	04/09/25	**17**	J	2
USGS-068	04/09/25	**43**	J	2

Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.
Bold concentrations are positive detections, greater than or equal to 3 SD.

Table 17. Strontium-90 concentrations (pCi/L) in water samples, second quarter, 2025.

Sample Location	Sample Date	Strontium		
		Result		1 SD
Aquifer Samples				
Facility				
Central Facilities Area				
USGS-085	04/03/25	**2.57**	-	0.37
Idaho Nuclear Technology and Engineering Center				
USGS-052	04/01/25	**2.11**	-	0.21
USGS-067	04/01/25	**9.11**	-	0.52
Naval Reactors Facility				
NRF-06	05/19/25	1.54	U	0.71
NRF-09	05/20/25	-0.295	U	0.402
NRF-11	05/20/25	0.028	U	0.308
NRF-12	05/20/25	0.467	U	0.236
Test Area North				
TAN-28	04/15/25	**218**	-	9
TAN-29	04/15/25	**14.5**	-	1.1
TAN-42	04/15/25	0.412	U	0.299
TAN-2336	04/16/25	**319**	-	14
TAN 2271	04/16/25	**273**	-	12
TAN-47	06/09/25	-0.243	U	0.293
Other Samples				
Perched Groundwater				
Advanced Test Reactor Complex				
USGS-062	04/09/25	0.965	U	0.363
USGS-068	04/09/25	**5.87**	-	0.66

Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.
Bold concentrations are positive detections, greater than or equal to 3 SD.

Table 18. Technetium-99 concentrations (pCi/L) in water samples, second quarter, 2025.

Sample Location	Sample Date	Technetium-99		
		Result		1 SD
Aquifer Samples				
Facility				
Central Facilities Area				
USGS-085	04/03/25	0.344	U	0.267
CFA 1	04/10/25	**4.88**	-	0.41
Idaho Nuclear Technology and Engineering Center				
USGS-052	04/01/25	**446**	-	22
USGS-067	04/01/25	**81.7**	-	4.0
Test Area North				
TAN-47	06/09/25	0.19	U	1.02

Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.
Bold concentrations are positive detections, greater than or equal to 3 SD.

Table 19. Plutonium and Americium isotope concentrations (pCi/L) in water samples, second quarter, 2025.

Sample Location	Sample Date	Plutonium-238			Plutonium-239/40			Americium-241		
		Result		1 SD	Result		1 SD	Result		1 SD
Aquifer Samples										
Facility										
Advanced Test Reactor Complex										
USGS-065	04/14/25	-	-	-	-	-	-	0.0212	U	0.0141
Idaho Nuclear Technology and Engineering Center										
USGS-052	04/01/25	-0.00206	U	0.00544	0.000	U	0.00206	-	-	-
USGS-067	04/01/25	0.00210	U	0.00210	-0.0042	U	0.00298	-	-	-
Radioactive Waste Management Complex										
USGS-087	04/07/25	0.00210	U	0.00696	0.00210	U	0.00210	0.00995	U	0.00530
M6S	05/05/25	0.00219	U	0.00379	0.000	U	0.00219	0.00428	U	0.00742
M1S	05/06/25	0.0751	U	0.0435	0.0250	U	0.0251	0.0318	U	0.0150
Test Area North										
TAN-47	06/09/25	-0.0109	U	0.0244	0.0218	U	0.0155	-	-	-

Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively. **Bold** concentrations are positive detections, greater than or equal to 3 SD.

Table 20. Uranium isotope concentrations (pCi/L) in water samples, second quarter, 2025.

Sample Location	Sample Date	Uranium-234			Uranium-235			Uranium-238		
		Result		1 SD	Result		1 SD	Result		1 SD
Aquifer Samples										
Facility										
Idaho Nuclear Technology and Engineering Center										
USGS-052	04/01/25	**1.25**	-	0.09	0.0549	U	0.0185	**0.622**	-	0.061
USGS-067	04/01/25	**1.48**	-	0.11	**0.0835**	-	0.0234	**0.668**	-	0.064
Radioactive Waste Management Complex										
USGS-087	04/07/25	**1.05**	-	0.06	0.0261	U	0.0098	**0.482**	-	0.038
M6S	05/05/25	**1.28**	-	0.10	0.0274	U	0.0138	**0.663**	-	0.067
M1S	05/06/25	**0.837**	-	0.074	0.0377	U	0.0155	**0.332**	-	0.043
Test Area North										
TAN-28	04/15/25	**3.52**	-	0.18	**0.147**	-	0.025	**0.574**	-	0.045
TAN-2336	04/16/25	2.89	U	0.97	0.300	U	0.300	1.20	U	0.72
TAN-29	04/15/25	**5.06**	-	0.26	**0.144**	-	0.030	**0.975**	-	0.078
TAN-42	04/15/25	**1.91**	-	0.15	0.0842	U	0.0335	**0.819**	-	0.092
TAN-44	04/15/25	**1.75**	-	0.11	0.0453	U	0.0220	**0.861**	-	0.070
TAN-47	06/09/25	**0.986**	-	0.081	0.0522	U	0.0186	**0.605**	-	0.060

Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.
Bold concentrations are positive detections, greater than or equal to 3 SD.

Table 21. Common ion concentrations (mg/L) in water samples, second quarter, 2025.

Sample Location	Sample Date	Calcium*		Magnesium*		Sodium*		Potassium*		Chloride		Sulfate		Alkalinity†	
Aquifer Samples															
Boundary															
Crossroads	04/07/25	-	-	-	-	-	-	-	-	10.9	-	22.5	-	141	-
USGS-008	04/07/25	-	-	-	-	-	-	-	-	7.87	-	22.9	-	154	-
USGS-011	04/08/25	-	-	-	-	-	-	-	-	9.42	-	23.1	-	141	-
USGS-124	04/08/25	-	-	-	-	-	-	-	-	17.0	-	24.6	-	140	-
Atomic City	05/06/25	-	-	-	-	-	-	-	-	16.4	-	17.4	-	132	-
USGS-103	06/12/25	-	-	-	-	-	-	-	-	14.6	-	22.8	-	137	-
USGS-131A (616 ft bgs)	06/16/25	-	-	-	-	-	-	-	-	18.6	-	24.3	-	138	-
USGS-131A (812 ft bgs)	06/16/25	-	-	-	-	-	-	-	-	22.2	-	27.1	-	147	-
USGS-132	06/18/25	-	-	-	-	-	-	-	-	11.3	-	25.2	-	143	-
USGS-137A	06/23/25	-	-	-	-	-	-	-	-	12.0	-	24.8	-	140	-
USGS-105 (1072 ft bgs)	06/24/25	-	-	-	-	-	-	-	-	13.0	-	24.4	-	140	-
USGS-105 (952 ft bgs)	06/24/25	-	-	-	-	-	-	-	-	12.9	-	23.7	-	143	-
Middle-2051 (1091 ft bgs)	06/25/25	-	-	-	-	-	-	-	-	11.5	-	22.8	-	144	-
Middle-2051 (749 ft bgs)	06/25/25	-	-	-	-	-	-	-	-	10.9	-	24.5	-	150	-
USGS-108	06/26/25	-	-	-	-	-	-	-	-	17.2	-	24.9	-	147	-
Distant															
MV-27	05/29/25	-	-	-	-	-	-	-	-	52.2[2]	-	66.1	-	179	-
MV-58	05/29/25	-	-	-	-	-	-	-	-	6.65	-	10.8	-	104	-
Facility															
Advanced Test Reactor Complex															
USGS-065	04/14/25	-	-	-	-	-	-	-	-	19.4	-	136[2]	-	130	-
Central Facilities Area															
USGS-085	04/03/25	-	-	-	-	-	-	-	-	12.8	-	41.5	-	152	-
CFA 1	04/10/25	-	-	-	-	-	-	-	-	70.2[2]	-	34.5	-	130	-
ICPP-MON-A-166	04/14/25	-	-	-	-	-	-	-	-	22.8	-	20.5	-	123	-
Idaho Nuclear Technology and Engineering Center															
USGS-052	04/01/25	-	-	-	-	-	-	-	-	24.2	-	25.2	-	141	-
USGS-067	04/01/25	-	-	-	-	-	-	-	-	36.5[1]	-	26.3	-	138	-
Materials and Fuels Complex															
USGS-100	04/10/25	-	-	-	-	-	-	-	-	15.6	-	18.0	-	133	-
Naval Reactors Facility															
NRF-06	05/19/25	-	-	-	-	-	-	-	-	405[4]	-	69.9	-	165	-
NRF-09	05/20/25	-	-	-	-	-	-	-	-	54.9[1]	-	40.3	-	194	-
NRF-11	05/20/25	-	-	-	-	-	-	-	-	38.7[1]	-	37.2	-	194	-
NRF-12	05/20/25	-	-	-	-	-	-	-	-	36.8[1]	-	38.2	-	194	-
Radioactive Waste Management Complex															
USGS-087	04/07/25	-	-	-	-	-	-	-	-	31.6	-	26.4	-	104	-
A11A31	05/05/25	-	-	-	-	-	-	-	-	28.1	-	46.7	-	130	-
M6S	05/05/25	-	-	-	-	-	-	-	-	27.0[1]	-	77.3[1]	-	92.9	-
M7S	05/06/25	-	-	-	-	-	-	-	-	14.6	-	25.2	-	139	-

Sample Location	Sample Date	Calcium*		Magnesium*		Sodium*		Potassium*		Chloride		Sulfate		Alkalinity†	
M15S	05/06/25	-	-	-	-	-	-	-	-	78.8[2]	-	44.1	-	90.9	-
M1S	05/06/25	-	-	-	-	-	-	-	-	13.5	-	21.7	-	94.9	-
Test Area North															
TAN-28	04/15/25	100	-	46	-	77	-	6.2	-	85.5[2]	-	17.3	-	468	-
TAN-29	04/15/25	71	-	21	-	50	-	5.3	-	75.6[2]	-	37.2	-	213	-
TAN-42	04/15/25	59	-	16	-	17	-	3.0	-	37.8[1]	-	33.5	-	156	-
TAN-44	04/15/25	63	-	18	-	23	-	3.4	-	58.5[2]	-	34.9	-	152	-
TAN-2336	04/16/25	50[2]	-	120[2]	-	7000[5]	-	35[2]	-	53.2[4]	-	3.59[4]	UJ	12000	-
TAN 2271	04/16/25	57	-	49	-	100	-	7.9	-	98.7[2]	-	41.0	-	414	-
TAN-2312	06/09/25	-	-	-	-	-	-	-	-	8.58	-	25.1	-	123	-
ANP-8	06/09/25	46	-	15	-	7.2	-	3.1	-	16.0	-	31.0	-	138	-
TAN-47	06/09/25	34	-	13	-	6.2	-	3.0	-	13.6	-	19.9	-	112	-
TAN-51	06/10/25	53	-	15	-	7.3	-	3.0	-	32.6	-	29.6	-	129	-
Upgradient															
USGS-018	04/14/25	-	-	-	-	-	-	-	-	11.9	-	27.1	-	134	-
USGS-019	04/21/25	-	-	-	-	-	-	-	-	16.0	-	26.5	-	163	-
USGS-027	04/21/25	-	-	-	-	-	-	-	-	43.5[1]	-	39.2	-	158	-
P&W-2	04/21/25	-	-	-	-	-	-	-	-	8.97	-	30.6	-	140	-
Other Samples															
Perched Groundwater															
Advanced Test Reactor Complex															
USGS-062	04/09/25	87	-	28	-	14	-	3.6	-	21.7	-	192[2]	-	150	-
USGS-068	04/09/25	-	-	-	-	-	-	-	-	69.7[3]	-	284[3]	-	193	-

Data qualifiers: U = undetected, J = estimate, R = rejected, "<" = less than detection limit, "+" or "-" after a J means that the estimated result is biased high or low, respectively.
† As $CaCO_3$.
"-" = not analyzed.
Bgs = below ground surface.
Note 1. Lab indicated that a 2:1 dilution of this sample was required for this analyte. Note 2. Lab indicated that a 5:1 dilution of this sample was required for this analyte. Note 3. Lab indicated that a 10:1 dilution of this sample was required for this analyte. Note 4. Lab indicated that a 20:1 dilution of this sample was required for this analyte. Note 5. Lab indicated that a 50:1 dilution of this sample was required for this analyte.

Table 22. Dissolved metals concentrations (µg/L) in water samples, second quarter, 2025.

Sample Location	Sample Date	Arsenic	Barium	Chromium	Iron	Lead	Manganese
Aquifer Samples							
Boundary							
Crossroads	04/07/25	-	-	4.5	-	-	-
USGS-008	04/07/25	-	-	3.2	-	-	-
USGS-011	04/08/25	-	-	4.2	-	-	-
USGS-124	04/08/25	-	-	6.1	-	-	-
Atomic City	05/06/25	-	-	2.5	-	-	-
USGS-103	06/12/25	-	-	6.5	-	-	-
USGS-131A (616 ft bgs)	06/16/25	-	-	11	-	-	-
USGS-131A (812 ft bgs)	06/16/25	-	-	10	-	-	-
USGS-132	06/18/25	-	-	7.9	-	-	-
USGS-137A	06/23/25	-	-	7.2	-	-	-
USGS-105 (1072 ft bgs)	06/24/25	-	-	8.5	-	-	-
USGS-105 (952 ft bgs)	06/24/25	-	-	7.8	-	-	-
Middle-2051 (1091 ft bgs)	06/25/25	-	-	6.8	-	-	-
Middle-2051 (749 ft bgs)	06/25/25	-	-	6.9	-	-	-
USGS-108	06/26/25	-	-	6.6	-	-	-
Distant							
MV-27	05/29/25	-	-	1.5	-	-	-
MV-58	05/29/25	-	-	3.1	-	-	-
Facility							
Advanced Test Reactor Complex							
USGS-065	04/14/25	-	-	110	-	-	-
Central Facilities Area							
USGS-085	04/03/25	-	-	18	-	-	-
CFA 1	04/10/25	-	-	15	-	-	-
ICPP-MON-A-166	04/14/25	-	-	4.9	-	-	-
Idaho Nuclear Technology and Engineering Center							
USGS-052	04/01/25	-	-	7.5	-	-	-
USGS-067	04/01/25	-	-	7.1	-	-	-
Materials and Fuels Complex							
USGS-100	04/10/25	-	-	6.4	-	-	-
Naval Reactors Facility							
NRF-06	05/19/25	-	-	70	-	-	-
NRF-09	05/20/25	-	-	14	-	-	-
NRF-11	05/20/25	-	-	13	-	-	-
NRF-12	05/20/25	-	-	11	-	-	-
Radioactive Waste Management Complex							
USGS-087	04/07/25	-	-	3.2	-	-	-
A11A31	05/05/25	-	-	13	-	-	-

Sample Location	Sample Date	Arsenic		Barium		Chromium		Iron		Lead		Manganese	
M6S	05/05/25	-	-	-	-	26	-	-	-	-	-	-	-
M7S	05/06/25	-	-	-	-	11	-	-	-	-	-	-	-
M15S	05/06/25	-	-	-	-	42	-	-	-	-	-	-	-
M1S	05/06/25	-	-	-	-	39	-	-	-	-	-	-	-
Test Area North													
TAN-28	04/15/25	1.6	J	370	-	2.5	-	1400	-	<1.0	U	2300	-
TAN-29	04/15/25	1.7	J	200	-	1.4	-	<10	U	<1.0	U	42	-
TAN-42	04/15/25	2.1	-	150	-	4.6	-	<10	U	<1.0	U	0.49	J
TAN-44	04/15/25	2.0	-	160	-	4.4	-	<10	U	<1.0	U	0.48	J
TAN-2336	04/16/25	46[3]	J	2100[3]	-	460[3]	-	8400[1]	-	2.9[3]	J	380[3]	-
TAN 2271	04/16/25	1.2	J	510	-	1.8	-	2400	-	<1.0	U	910	-
TAN-2312	06/09/25	-	-	-	-	6.8	-	-	-	-		-	-
ANP-8	06/09/25	1.7	J	84	-	4.2	-	9.6	J	<1.0	U	2.9	-
TAN-47	06/09/25	1.8	J	47	-	5.0	-	3.1	J	<1.0	U	0.33	J
TAN-51	06/10/25	1.9	J	89	-	4.8	-	<10	U	0.15	J	<1	U
Upgradient													
USGS-018	04/14/25	-	-	-	-	3.3	-	-	-	-	-	-	-
USGS-019	04/21/25	-	-	-	-	3.6	-	-	-	-	-	-	-
USGS-027	04/21/25	-	-	-	-	6.4	-	-	-	-	-	-	-
P&W-2	04/21/25	-	-	-	-	2.3	-	-	-	-	-	-	-
Other Samples													
Perched Groundwater													
Advanced Test Reactor Complex													
USGS-062	04/09/25	9.2	-	-		10	-	-	-	-	-	-	-
USGS-068	04/09/25	-	-	-	-	65	-	-	-	-	-	-	-

Data qualifiers: U = undetected, J = estimate, R = rejected, "<" = less than detection limit, "+" or "-" after a J means that the estimated result is biased high or low, respectively.
"-" = not analyzed.
ft bgs = feet below ground surface.
Note 1. Lab indicated that a 5:1 dilution of this sample was required for this analyte. Note 2. Lab indicated that a 20:1 dilution of this sample was required for this analyte. Note 3. Lab indicated that a 25:1 dilution of this sample was required for this analyte.

Table 23. Dissolved nutrient concentrations (mg/L) in water samples, second quarter, 2025.

Sample Location	Sample Date	Nitrate + Nitrate*		Total Phosphorous	
Aquifer Samples					
Boundary					
Crossroads	04/07/25	0.73	-	-	-
USGS-008	04/07/25	1.0	-	-	-
USGS-011	04/08/25	0.74	-	-	-
USGS-124	04/08/25	0.88	-	-	-
Atomic City	05/06/25	1.8	-	-	-
USGS-103	06/12/25	0.81	-	-	-
USGS-131A (616 ft bgs)	06/16/25	0.96	-	-	-
USGS-131A (812 ft bgs)	06/16/25	1.2	-	-	-
USGS-132	06/18/25	0.73	-	-	-
USGS-137A	06/23/25	0.74	-	-	-
USGS-105 (1072 ft bgs)	06/24/25	0.81	-	-	-
USGS-105 (952 ft bgs)	06/24/25	0.85	-	-	-
Middle-2051 (1091 ft bgs)	06/25/25	0.92	-	-	-
Middle-2051 (749 ft bgs)	06/25/25	0.86	-	-	-
USGS-108	06/26/25	1.0	-	-	-
Distant					
MV-27	05/29/25	2.6[1]	-	-	-
MV-58	05/29/25	1.5	-	-	-
Facility					
Advanced Test Reactor Complex					
USGS-065	04/14/25	1.4	-	-	-
Central Facilities Area					
USGS-085	04/03/25	0.98	-	-	-
CFA 1	04/10/25	2.4[1]	-	-	-
ICPP-MON-A-166	04/14/25	0.37	-	-	-
Idaho Nuclear Technology and Engineering Center					
USGS-052	04/01/25	3.5[1]	-	-	-
USGS-067	04/01/25	4.8[2]	-	-	-
Materials and Fuels Complex					
USGS-100	04/10/25	2.5[1]	-	-	-
Naval Reactors Facility					
NRF-06	05/19/25	2.1[1]	-	-	-
NRF-09	05/20/25	3.1[1]	-	-	-
NRF-11	05/20/25	2.3[1]	-	-	-
NRF-12	05/20/25	2.3[1]	-	-	-
Radioactive Waste Management Complex					
USGS-087	04/07/25	0.51	-	-	-
A11A31	05/05/25	0.90	-	-	-
M6S	05/05/25	2.0[1]	-	-	-
M7S	05/06/25	0.83	-	-	-

Sample Location	Sample Date	Nitrate + Nitrate*		Total Phosphorous	
M15S	05/06/25	1.5	-	-	-
M1S	05/06/25	1.0[1]	-	-	-
Test Area North					
TAN-28	04/15/25	0.010	J	-	-
TAN-29	04/15/25	2.7[1]	-	-	-
TAN-42	04/15/25	1.4	-	0.038	-
TAN-44	04/15/25	2.0[1]	-	-	-
TAN-2336	04/16/25	0.28	-	48[3]	-
TAN 2271	04/16/25	0.0042	J	-	-
TAN-2312	06/09/25	0.73	-	-	-
ANP-8	06/09/25	0.97	-	-	-
TAN-47	06/09/25	0.71	-	-	-
TAN-51	06/10/25	1.2	-	-	-
Upgradient					
USGS-018	04/14/25	0.65	-	-	-
USGS-019	04/21/25	1.5	-	-	-
USGS-027	04/21/25	2.5[1]	-	-	-
P&W-2	04/21/25	0.52	-	-	-
Other Samples					
Perched Groundwater					
Advanced Test Reactor Complex					
USGS-062	04/09/25	1.4	-	-	-
USGS-068	04/09/25	9.0[2]	-	-	-

Data qualifiers: U = undetected, J = estimate, R = rejected, "<" = less than detection limit, "+" or "-" after a J means that the estimated result is biased high or low, respectively. ft bgs = feet below ground surface.
* As N.
"-" = not analyzed.
ft bgs = feet below ground surface.
Note 1. Lab indicated that a 2:1 dilution of this sample was required for this analyte. Note 2. Lab indicated that a 5:1 dilution of this sample was required for this analyte. Note 3. Lab indicated that a 100:1 dilution of this sample was required for this analyte.

Table 24. Volatile organic compound concentrations (µg/L) in water samples, second quarter, 2025. Only VOCs detected this quarter or in the recent past are shown.

Sample Location	Sample Date	PCE		TCE		1,1-DCE		cis-1,2-DCE		trans-1,2-DCE		Vinyl Chloride		1,1- DCA		2-Hexanone	
Aquifer Samples																	
Facility																	
Radioactive Waste Management Complex																	
USGS-087	04/07/25	<0.5	U	0.98	-	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<2.5	U
A11A31	05/05/25	<0.5	U	1.41	-	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<2.5	U
M6S	05/05/25	<0.5	U	0.83	-	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<2.5	U
M7S	05/06/25	0.48	J	2.34	-	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<2.5	U
M15S	05/06/25	0.60	-	4.74	-	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<2.5	U
M1S	05/06/25	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<2.5	U
Test Area North																	
TAN-28	04/15/25	<0.5	U	0.32	J	<0.5	U	4.71	-	44.0	-	7.86	-	0.38	J	<2.5	U
TAN-29	04/15/25	17.0	-	604[3]	-	0.77	-	33.2	-	7.95	-	0.73	-	0.78	-	<2.5	U
TAN-42	04/15/25	6.34	-	48.4	-	0.37	J	1.07	-	0.32	J	<0.5	U	<0.5	U	<2.5	U
TAN-44	04/15/25	2.43	-	20.8	-	<0.5	U	0.56	-	0.27	J	<0.5	U	<0.5	U	<2.5	U
TAN-2336	04/16/25	<10[3]	U	<10[3]	U	<10[3]	U	<10[3]	U	<10[3]	U	<10[3]	U	<10[3]	U	22.6[3]	J
TAN 2271	04/16/25	<0.5	U	0.76	-	<0.5	U	2.48	-	96.8[1]	-	3.81	-	0.44	J	<2.5	U
TAN-2312	06/09/25	<0.5	U	<0.25	J	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<2.5	U
ANP-8	06/09/25	2.99	-	21.0	-	<0.5	U	0.38	J	<0.5	U	<0.5	U	<0.5	U	<2.5	U
TAN-47	06/09/25	4.57	-	21.0	-	<0.5	U	0.26	J	<0.5	U	<0.5	U	<0.5	U	<2.5	U
TAN-51	06/10/25	19.0	-	222[2]	-	0.58	-	2.79	-	1.29	-	<0.5	U	0.56	-	<2.5	U

Table 24 cont. Volatile organic compound concentrations (µg/L) in water samples, second quarter, 2025. Only VOCs detected this quarter or in the recent past are shown.

Sample Location	Sample Date	Carbon Tetrachloride		Chloroform		Methylene Chloride		Dichloro-difluoro-methane		1,1-DCA		Propio-nitrile		Methyl Ethyl Ketone	
Aquifer Samples															
Facility															
Radioactive Waste Management Complex															
USGS-087	04/07/25	3.08	-	<0.5	U	<0.5	U	1.33	-	<0.5	U	<0.5	U	<10	U
M1S	05/06/25	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<10	U
M6S	05/05/25	2.93	-	0.49	J	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<10	U
M15S	05/06/25	7.21	-	2.97	-	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<10	U
A11A31	05/05/25	2.82	-	0.70	-	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<10	U
M7S	05/06/25	3.98	-	1.09	-	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<10	U
Test Area North															
TAN-2336	04/16/25	<10[3]	U	<10[3]	U	<10[3]	U	<10[3]	U	<10[3]	U	31.6[3]	-	3430[3]	-
TAN-2271	04/16/25	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<10	U
TAN-28	04/15/25	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<10	U
TAN-29	04/15/25	<0.5	U	0.43	J	<0.5	U	<0.5	U	0.78	-	<0.5	U	<10	U
TAN-42	04/15/25	<0.5	U	<0.5	U	1.85	J+	<0.5	U	<0.5	U	<0.5	U	<10	U
TAN-44	04/15/25	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<10	U
TAN-47	06/09/25	<0.5	U	<0.5	U	1.25	J+	<0.5	U	<0.5	U	<0.5	U	<10	U
TAN-51	06/10/25	<0.5	U	0.40	J	<0.5	U	<0.5	U	0.56	-	<0.5	U	<10	U
TAN-2312	06/09/25	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<10	U
ANP-8	06/09/25	<0.5	U	<0.5	U	0.99	J+	<0.5	U	<0.5	U	<0.5	U	<10	U

Abbreviations: PCE = tetrachloroethene; TCE = trichloroethene; 1,1-DCE = 1,1-dichloroethene; cis-1,2-DCE = cis-1,2-dichloroethene; trans-1,2-DCE = trans-1,2-dichloroethene; 1,1-DCA = 1,1-dichloroethane; 1,1,1 TCA = 1,1,1-trichloroethane.
Data qualifiers: U = undetected, J = estimate, R = rejected, "<" = less than detection limit, "+" or "-" after a J means that the estimated result is biased high or low, respectively.
Note 1. Lab indicated that a 5:1 dilution of this sample was required for this analyte. Note 2. Lab indicated that a 10:1 dilution of this sample was required for this analyte. Note 3. Lab indicated that a 20:1 dilution of this sample was required for this analyte.

Terrestrial Monitoring Results

The DEQ-INL OP conducts terrestrial (soil and milk) monitoring to characterize deposition and migration of contaminants and provide independent verification of DOE's terrestrial monitoring programs. Physical soil sampling and *in-situ* gamma spectrometry are used to characterize actual deposition and accumulation of radioactive contaminants in soils. Milk samples are collected to evaluate the potential for ingestion of radioactivity by the population around the INL. Twelve milk samples were analyzed during the quarter.

Milk

DEQ-INL OP monitors milk for the naturally occurring radionuclide potassium-40 (^{40}K) and man-made iodine-131 (^{131}I). Milk samples are collected on a monthly basis. Results for analyses of milk samples are presented in **Table 25**. ^{40}K was detected in all samples within the expected range of concentration. ^{131}I was not detected. Based on measurements of radionuclides in milk, there were no discernable impacts to the off-site environment from INL operations.

Table 25. Gamma spectrometry analysis data for milk samples, second quarter, 2025.

Sample Location/Dairy	Sample Date	Naturally occurring Potassium-40		Man-made Iodine-131		
		Concentration[2]	1 SD	Concentration[2]		1 SD
Monitoring Samples						
Gooding	04/14/25	**1354**	57	-0.2	U	0.9
Gooding	05/12/25	**1462**	59	1.7	U	0.8
Gooding	06/09/25	**1412**	57	-0.5	U	0.8
Monteview	04/21/25	**1338**	56	0.0	U	0.4
Monteview	05/27/25	**1443**	59	-0.9	U	0.7
Monteview	06/23/25	**1500**	60	-0.9	U	0.8
Ucon	04/05/25	**1497**	59	0.7	U	0.8
Ucon	05/03/25	**1549**	62	-0.9	U	1.2
Ucon	05/31/25	**1551**	62	0.4	U	0.8
Verification Samples[1]						
Dietrich	04/21/25	**1296**	53	-0.1	U	1.0
Minidoka	05/19/25	**1456**	59	-0.6	U	0.7
Monteview	06/16/25	**1455**	59	0.5	U	0.7

[1] DEQ-INL OP samples collected by the off-site INL environmental surveillance contractor.
[2] Concentrations with associated uncertainties (1 SD) are expressed in pCi/L. **Bold** concentrations are positive detections, greater than or equal to 3 SD. Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.

Quality Assurance

Measurements of constituent concentrations in environmental media are subject to inaccuracy from errors that may be introduced during the collection, transportation, and analysis of samples, calibration of equipment, and recording and reporting of results. While it is impossible to quantify every error that may affect a result, a quality assurance (QA) program can evaluate the overall quality of a dataset and, in many cases, identify and address errors or inaccuracies. DEQ-INL OP's QA program is designed to (1) ensure sample integrity, (2) evaluate the precision and accuracy of analytical results, and (3) ensure that the environmental data are representative and complete.

This section summarizes the quality assurance assessment of the data collected by DEQ-INL OP in the second quarter of 2025. Included are the results of quality control (QC) samples (blanks, duplicates, and spikes) that DEQ-INL OP submitted to Idaho State University's Environmental Monitoring Laboratory (ISU-EML) for radiological analyses and to the Idaho Bureau of Laboratories-Boise (IBL) for non-radiological analyses during the quarter. The analytical results of QC samples are used to assess the precision, accuracy, and representativeness of the environmental data presented in this report. During the second quarter of 2025, DEQ-INL OP and contracted laboratories performed 143 QC analyses on various radiological and non-radiological samples. (**Table 26**).

All samples referenced in this report were collected in accordance with written procedures maintained by the DEQ-INL OP. Analytical methods and QC procedures used by the laboratories were performed in accordance with approved written procedures maintained by each lab. QC samples analyzed by the labs as part of each lab's internal QA program are not discussed in this report.

Blank Samples

Blank samples consist of matrices that contain immeasurable or acceptably low concentrations of the analyte(s) of interest. They are used to monitor contamination introduced during sample collection, storage, shipment, and analysis. For water matrices other than tritium, a blank sample consists of 18-megaohm deionized water from the DEQ-Idaho Falls Regional office. Mud Lake Well #2 serves as the water source for tritium analysis blanks, notable for its low atmospheric recharge, which results in tritium concentrations below detectable levels.

A blank sample is categorized as a field blank, equipment blank, or trip blank depending on how the blank is handled. A field blank is used to monitor for contamination introduced from the environment during sample collection, an equipment blank is used to monitor for contamination introduced by contaminated equipment, and a trip blank is used to monitor for contamination introduced during transportation of samples (trip blanks are typically only used for VOCs). Also, method blanks for airborne tritium are used to monitor for contamination introduced during processing of molecular sieve sample material. Most water blank samples submitted to laboratories by DEQ-INL OP are field blanks.

For all analyses a blank sample result is considered acceptable if it is less than three standard deviations (3 SD) of the result. If a blank result exceeds acceptance criteria, detected results in other samples collected, transported, or analyzed together with the failed blank may be qualified as biased high (J+) or rejected (R), or may remain unqualified, depending on the relative sizes of the blank detection and other sample results.

Sample results for blank 47-mm TSP filters submitted for gross alpha and gross beta screening in air for the second quarter of 2025 are presented in **Table 27**. The blank filter gross beta result was slightly

greater than 3 SD and considered a detection for the week of 4/24 – 5/1/25. Associated gross beta results for that week are significantly higher than the blank and are therefore not qualified as estimates.

Blank sample results for selected gamma emitters in air from 47-mm TSP filter quarterly composites and 8x10-inch monthly composites from second quarter 2025 are presented in **Table 28**. Blank sample results for radiochemical analysis of 8x10-inch TSP filter quarterly composites from first quarter 2025 are presented in **Table 29**. All blank results for composites met acceptance criteria.

Method blank and control sample analysis results used to assess data quality for tritium in water vapor in air are presented in **Table 30**. Method blanks are prepared by vaporizing tritium-free water and passing the air-vapor mixture through molecular sieve columns. The molecular sieve material is then processed identically to the field samples. Control samples are used to determine if tritium contamination is introduced into the samples from areas used for processing field samples and storage of the processed water. Most of these results for second quarter are considered estimates (J qualifier) due to QC control chart failures at the lab. See **Laboratory QC Issues** below. All results for tritium method blanks and control samples met acceptance criteria.

Blank sample results for radiological constituents in water are presented in **Table 31.** Blank sample results for metals, common ions and nutrients, and volatile organic compounds (VOCs) in water are presented in **Tables 32, 33,** and **34**. Two chromium blank results were greater than the lab's method detection limit (MDL) but less than the reporting detection limit (RDL) and are reported as detected estimates (J qualifier). Associated chromium results are significantly higher than the blanks and are therefore not qualified as estimates. All other blank sample results for water met acceptance criteria.

Duplicate Samples

A duplicate sample is one that is collected at the same location and approximately the same time as another sample (referred to as the "original" sample). Duplicate sample results are compared to the original sample's results to evaluate reproducibility. Significant differences between the two could indicate poor analytical precision or a non-uniform sample matrix.

The difference between the results of an original and duplicate sample (referred to below as a "duplicate-sample pair") is evaluated differently for radiological and non-radiological analyses. For radiological analyses, the results of a duplicate-sample pair are considered to be in agreement if their absolute difference is less than or equal to three times the pooled error of the results:

$|R_1 - R_2| \leq 3\sqrt{SD_1^2 + SD_2^2}$
R_1 = Original sample result
R_2 = Duplicate sample result
SD_1 = Analytical uncertainty (1 sample standard deviation) of the original result
SD_2 = Analytical uncertainty (1 sample standard deviation) of the duplicate result

Duplicate radiological results are also considered to be in agreement if their relative percent difference (RPD) is no more than ±20 percent. RPD is calculated as:

$$RPD = \frac{R_1 - R_2}{(R_1 + R_2)/2} \times 100$$

For non-radiological analyses, the RPD is used to evaluate duplicate sample pairs in which both results exceed five times the reporting detection limit (RDL). An RPD of up to ±20 percent is acceptable. If one

or both sample results are less than five times the RDL, the results agree if their absolute difference is less than or equal to the RDL.

Duplicate sample results for selected gamma emitters in air from 8x10-inch monthly TSP filter composites from the Idaho Falls monitoring location are presented in **Table 35**. Duplicate sample results for radiochemical analysis of 8x10-inch TSP filter quarterly composites from first quarter 2025, from the Idaho Falls monitoring location, are presented n **Table 36.** All TSP duplicate sample results met acceptance criteria.

Duplicate results for quarterly average EcoGamma readings from the Big Southern Butte monitoring location are presented in **Table 37.** These duplicate results met acceptance criteria.

Duplicate results for radiological analyses in groundwater and surface water are presented in **Table 38**. Duplicate results for metals, common ions and nutrients, and VOCs in groundwater are presented in **Tables 39, 40, and 41.** All duplicate water sample results met acceptance criteria for the second quarter 2025.

Spiked Samples

Spiked samples are samples to which known concentrations of specific analytes have been added. They are used to assess a laboratory's analytical accuracy. The percent recovery (%R) of each spiked-sample analysis is calculated as the ratio of the spike concentration determined by the lab to the known spike concentration. DEQ-INL OP considers the lab's result to be in control if the percent recovery is 100 ± 25%. If the percent recovery of a spiked sample is 50-74%, detected results of samples analyzed in the same batch as the spiked sample may be qualified as low-biased estimates (J-), and undetected results may be qualified as undetected estimates (UJ). If the percent recovery of a spiked sample is 126-150%, detected results of associated samples may be qualified as high-biased estimates (J+), and undetected results may be qualified as undetected (U). If the percent recovery of a spiked sample is <50% or >150%, the results of all associated samples may be qualified as rejected (R), except for undetected sample results associated with a spiked-sample analysis having a percent recovery >150%, in which case the sample result remains qualified as undetected (U).

Second quarter spiked sample results for metals, common ions and nutrients, and VOCs in water are presented in **Tables 42, 43,** and **44**. For VOCs, the results for styrene and methylene chloride did not meet acceptance criteria. Associated field sample detections for methylene chloride were qualified as biased-high estimates (J+). There were no field sample detections for styrene. All other spiked sample results met acceptance criteria.

DEQ-INL OP also prepares additional "spike-like" quality control samples to assess ambient radiation measurement bias. Once per quarter, DEQ-INL OP irradiates several electret ionization chambers (EICs) at ISU to verify EIC response. Irradiations of EICs are conducted in a repeatable geometry to a known exposure of near 30 mR and two additional higher and lower exposures, ranging from 15 to 60 mR. EIC responses are compared directly with the exposure received from the NIST traceable cesium-137 source provided by ISU-EML. EIC response is considered acceptable if each measurement has a percent recovery of 100 ± 25% when compared to the known irradiated quantity. Overall response for each control set is considered acceptable if the average of the three individual results for the set has a percent recovery of 100 ± 25%. Real-time pressure correction is used to calculate the net exposure measured by these EIC control sets. The ISU irradiation results for the second quarter 2025 are presented in **Table 45**. All individual EIC results and all EIC control set averages passed the DEQ-INL OP acceptance criterion.

Laboratory QC Issues

ISU-EML's internal quality data from one of their two liquid scintillation counters indicated control chart failures for tritium standards, backgrounds or blanks during part of the reporting period. EML recommended that most of the analyses made with the instrument be considered estimates (J qualifier). EML indicated that these failures were under intensive investigation by the laboratory manager with the assistance from the manufacturer.

DEQ-INL OP Equipment QC Issues

There were no DEQ-INL OP equipment QC issues in the second quarter of 2025.

Qualification of Low-Level Sample Results

Starting in the first quarter of 2024, INL-OP changed the methods used for qualifying and reporting sample results. These changes apply primarily to low-level results. The changes listed below bring INL-OP's qualification and reporting conventions in line with the INL contractors' methods.

For radiological results, the minimum detectable concentration (MDC) is no longer used as the criterion above which the result is considered a positive detection. The following criteria are used instead[7,8,9]:

4. Results greater or equal to 3 SD are reported as positive detections, where SD is the sample standard deviation.
5. Results less than 3 SD are reported as non-detections (U qualifier).
6. Field sample results are reported together with the 1-SD value.

For non-radiological results, the qualification and reporting conventions followed by the sample analysis contractor, Idaho Bureau of Laboratories (IBL), are used. With each result, the IBL reports both the Method Detection Limit[10] (MDL) and the higher Reporting Detection Limit[11] (RDL).

4. Results greater than MDL and greater than RDL are reported as positive detections.
5. Results greater than MDL but less than RDL are reported as detected estimates (J qualifier) with greater associated uncertainty.
7. Results less than MDL are non-detections and reported as less than (RDL value).

Analytical QA/QC Assessment

Other than those discussed above, no issues involving sample chain of custody, sample holding times, and the analysis of blank, duplicate, and spiked samples were observed during the second quarter of 2025 which significantly affected data quality. The ratio of total QC analyses to total field sample analyses of 14.2% is above the DEQ-INL OP minimum requirement of 10%. Methodologies and data reports issued by the contracting laboratories conformed to the requirements of DEQ-INL OP during the second quarter of 2025.

[7] Idaho National Laboratory Site Environmental Surveillance Program Report, Third Quarter 2023, INL/RPT-24-77413, p. 3
[8] HANDBOOK FOR THE DEPARTMENT OF ENERGY'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP), MAPEP-HB-1, July 6,2022, p.30.
[9] An Update of Hydrologic Conditions and Distribution of Selected Constituents in Water, Eastern Snake River Aquifer and Perched Groundwater Zones, Idaho National Laboratory, Idaho, Emphasis 2019–21, U. S. Geological Survey, DOE/ID-22261, p. 29.
[10]The MDL is defined as the minimum concentration of substance that can be measured and reported with 99% confidence that an analyte concentration is greater than zero, and is determined from an analysis of a sample in a given matrix containing the analyte.
[11]IBL utilizes the Practical Quantitation Limit (PQL) as the Reporting Detection Limit (RDL) for final data reports. PQL represents a practical and routinely achievable quantitation limit with a high degree of certainty (> 99.9% confidence) that the result is a positive detection.

Preventative Maintenance and Equipment Reliability

All equipment was calibrated and checked according to prescribed periodicity. Service reliability for air sampling equipment for the second quarter of 2025 is summarized in **Table 46**.

Conclusion

All data collected for the second quarter of 2025 have been assigned the applicable qualifiers to designate the appropriate use of the data. The overall data usability of 100.0% and data completeness of 100.0% are well above the acceptable value of 90% for the quarter, with the data meeting the requirements and data quality objectives established by DEQ-INL OP.

Table 26. Summary of the analyses performed, second quarter, 2025.

Media Sampled	Collection Device	Analyte	Field Sample Analyses	QC Blank Analyses	QC Duplicate Analyses	QC Spike Analyses	Field Data Rejected[1]	Analyzing Lab[2]
Air								
Total Suspended Particulate	47-mm filters	Gross alpha	156	13	0	0	0	ISU-EML
		Gross beta	156	13	0	0	0	ISU-EML
		Gamma emitters	12	1	0	0	0	ISU-EML
	8x10-inch filter	Gamma emitters	36	3	3	0	0	ISU-EML
		Radiochemical[6]:						
		Sr-90	12	1	1	0	0	ISU-Sub
		Pu-238, 239/240	12	1	1	0	0	ISU-Sub
		Am-241	12	1	1	0	0	ISU-Sub
Water Vapor	Desiccant column	Tritium	38	8 [8]	0	0	0	ISU-EML
Gaseous	Charcoal filter	Iodine-131	13	0	0	0	0	ISU-EML
Precipitation	Poly bottle	Tritium	8	0	0	0	0	ISU-EML
		Gamma emitters	8	0	0	0	0	ISU-EML
Water								
Ground water, perched ground water, waste pond effluent, and surface water	Grab or composite	Gross alpha	56	5	5	0	0	ISU-EML
		Gross beta	56	5	5	0	0	ISU-EML
		Gamma emitters	56	5	5	0	0	ISU-EML
		Tritium	56	5	5	0	0	ISU-EML
		Low-level tritium	20	0	3	0	0	ISU-EML
		Radiochemical[7]:						
		Sr-90	15	1	1	0	0	ISU-Sub
		Tc-99	5	1	0	0	0	ISU-Sub
		U-234, 235,238	11	0	1	0	0	ISU-Sub
		Pu-238, 239/240	6	0	1	0	0	ISU-Sub
		Am-241	4	0	1	0	0	ISU-Sub
		I-129	0	0	0	0	0	ISU-Sub
		Metals	50	4	5	1	0	IBL
		Common Ions	50	4	5	1	0	IBL
		Nutrients	50	4	5	1	0	IBL
		Volatile Organics	16	4	2	1	0	IBL
Terrestrial								
Milk	Grab or composite	Gamma emitters	12	0	0	0	0	ISU-EML
Soil	*in situ*	Gamma emitters	0	0	0	0	0	DEQ-INL OP
	Grab – "puck"	Gamma emitters	0	0	0	0	0	ISU-EML
Radiation								
Ambient	EICs	Gamma Radiation	67	0	0	9	0	DEQ-INL OP
	EcoGamma	Gamma Radiation	11	NA	1	0	0	DEQ-INL OP
Total analyses performed			**1004**	**79**	**51**	**13**	**0**	
Total QC analyses performed (blanks, duplicates, and spikes)			**143**					
Ratio of total QC analyses to total sample analyses[3]			**14.2%**					
Data usability[4], percent			**100.0%**					
Data completeness[5], percent			**100.0%**					

[1] Combined Laboratory and DEQ-INL OP rejection criteria (data was rejected for any reason).

[2] ISU-EML = Idaho State University – Environmental Monitoring Laboratory; ISU Sub = Subcontract laboratory to ISU-EML; IBL = Idaho Bureau of Laboratories, Boise; IBL Sub = Subcontract laboratory to IBL; DEQ-INL OP = Analyzed by INL Oversight Program, Idaho Department of Environmental Quality.

[3] DEQ-INL OP requires that the number of QC analyses performed be at least 10 percent of the number of sample analyses performed.

[4] Data usability is calculated as [total analyses – rejected data]/[total analyses]. DEQ-INL OP considers a data usability rate of 90 percent or higher to be acceptable.

[5] Data completeness is calculated as usable results divided by the total number of field sample results expected. DEQ-INL OP considers a data completeness rate of 90 percent or higher to be acceptable.

[6] Radiochemical analyses for these filter composites include Strontium-90 (Sr-90), Plutonium-238 and 239/240 (Pu-238, 239/240), and Americium-241 (Am-241).

[7] Radiochemical analyses for these water samples may include Strontium-90, Technetium-99 (Tc-99), Uranium 234, 235, and 238 (U-234, 235, 238), Plutonium-238 and 239/240, Americium-241, and Iodine-129 (I-129).

[8] Method blanks and control samples are included here.

Table 27. Blank analysis results for gross alpha and beta in 47-mm particulate air (TSP), second quarter, 2025.

Collection Period		Corrected volume (m^3)[1]	Gross alpha			Gross beta		
Start	Stop		Value		3 SD	Value		3 SD
12/26/24	04/03/25	583	0.0	U	0.3	0.4	U	0.9
04/03/25	04/10/25	583	0.0	U	0.3	0.0	U	0.9
04/10/25	04/17/25	583	-0.1	U	0.3	-0.3	U	0.9
04/17/25	04/24/25	583	0.1	U	0.3	0.4	U	0.9
04/24/25	05/01/25	583	-0.2	U	0.3	**0.7**	-	0.6
05/01/25	05/08/25	583	0.2	U	0.3	-0.1	U	0.9
05/08/25	05/15/25	583	0.1	U	0.3	-0.6	U	0.9
05/15/25	05/22/25	583	0.1	U	0.3	-0.8	U	0.9
05/22/25	05/29/25	583	0.0	U	0.6	-0.3	U	0.9
05/29/25	06/05/25	583	0.1	U	0.3	0.6	U	0.9
06/05/25	06/12/25	583	0.0	U	0.3	0.5	U	0.9
06/12/25	06/18/25	550	0.0	U	0.3	-0.1	U	0.9
06/18/25	06/26/25	583	0.0	U	0.3	0.1	U	0.9

Concentration values and associated uncertainty (3 SD) are expressed in 1 x 10^{-3} pCi/m^3.
A blank sample result is acceptable if it is less than three standard deviations (3 SD) of the result. **Bold** concentrations are positive detections, greater than or equal to 3 SD.
Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.
[1] A volume equal to the average of the weekly volumes collected through each valid field filter was used to compute "concentrations" for the blank for meaningful comparison to sample results. No air was passed through the blank filters.

Table 28. Blank results for gamma spectrometry analysis of monthly composites of 8x10-inch TSP air filters, and quarterly composites of 47-mm TSP air filters, second quarter, 2025.

Time period	Beryllium-7			Ruthenium-106/ Rhodium-106			Antimony-125			Cesium-134			Cesium-137		
	Conc		3 SD	Conc		3 SD	Conc		3 SD	Conc		3 SD	Conc		3 SD
Monthly composites[1] of 8x10-inch TSP air filters															
Apr	-8	U	36	8	U	78	0	U	12	3	U	6	0	U	6
May	11	U	18	-8	U	45	-1	U	6	0	U	3	0	U	3
Jun	6	U	21	-11	U	57	-1	U	6	0	U	3	-2	U	3
Quarterly composite[2] of 47-mm TSP air filters															
2nd Qtr.	1	U	78	8	U	273	-3	U	21	4	U	9	-1	U	9

Concentrations (Conc) are expressed in 1 x 10^{-5} pCi/m^3 with associated uncertainty (3 SD) and minimum detectable concentration (MDC).
A blank sample result is acceptable if it is less than three standard deviations (3 SD) of the result. **Bold** concentrations are positive detections, greater than or equal to 3 SD.
Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.

[1]These concentrations (Conc) are from blank 8x10-inch filters collected weekly, composited, and analyzed for the calendar month. [2]These concentrations are from blank 47-mm filters collected weekly, composited, and analyzed for the calendar quarter. A composite volume equal to the sum of the weekly average volumes collected through each valid field filter was used to compute "air concentrations" for the blank for meaningful comparison to sample results. No air actually passed through the blank filters.

Table 29. Blank analysis results for radiochemical analysis of 8x10-inch TSP air filters, quarterly composite samples, from first quarter, 2025.

Sample Description	^{90}Sr			^{238}Pu			^{239}Pu/^{240}Pu			^{241}Am		
	Value[1]		3 SD	Value[1]		3 SD	Value[1]	Qualifier	3 SD	Value[1]		3 SD
1Q 25 Blank	0.07	U	0.51	0.01	U	0.03	0.02	U	0.06	0.03	U	0.06

Concentrations are expressed in 1 x 10^{-5} pCi/m^3 with associated uncertainty (3 SD).
A blank sample result is acceptable if it is less than three standard deviations (3 SD) of the result. **Bold** concentrations are positive detections, greater than or equal to 3 SD.
Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.

[1] These concentrations are from blank filters collected weekly, composited, and analyzed for the calendar quarter. A composite volume equal to the sum of the weekly average volumes collected through each valid field filter was used to compute "air concentrations" for the blank for meaningful comparison to sample results. No air was passed through the blank filters.

Table 30. Method blank and control sample analysis results for tritium in water vapor from air samples, second quarter, 2025.

Sample Number	Start Date	Collection Date	Analysis Date	Tritium		
				Concentration		3 SD
Method Blanks						
OP252ZTR01	06/03/25	06/05/25	07/07/25	-0.06	UJ	0.09
OP252ZTR02	06/10/25	06/12/25	07/10/25	0.05	UJ	0.06
Control Samples						
Refrigerator	04/25/25	07/02/25	07/07/25	-0.07	UJ	0.09
Distilled Retail	04/25/25	04/25/25	04/28/25	0.04	U	0.06
Distilled Retail	06/17/25	06/17/25	06/21/25	0.03	UJ	0.06
Distilled Retail	07/02/25	07/02/25	07/18/25	-0.01	UJ	0.06
Sink	04/25/25	07/02/25	07/18/25	0.04	UJ	0.09
Sink	04/25/25	07/02/25	07/18/25	-0.02	UJ	0.06

Concentrations are expressed in nCi/L with associated uncertainty (3 SD).
A blank sample result is acceptable if it is less than three standard deviations (3 SD) of the result. **Bold** concentrations are positive detections, greater than or equal to 3 SD.
Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.

Table 31. Blank analysis results (pCi/L) for radiological constituents in water, second quarter, 2025.

Sample Number	Sample Date	Blank Type	Concentration		3 SD	Within Blank Criteria?
Gross Alpha						
251W021	04/10/25	Field	0.0	U	0.3	Yes
251W262	05/12/25	Field	0.1	U	0.3	Yes
251W318	05/19/25	Field	0.1	U	0.3	Yes
251W363	06/10/25	Field	-0.1	U	0.3	Yes
251W397	06/26/25	Field	0.0	U	0.3	Yes
Gross Beta						
251W021	04/10/25	Field	0.3	U	0.9	Yes
251W262	05/12/25	Field	0.1	U	0.9	Yes
251W318	05/19/25	Field	0.0	U	0.9	Yes
251W363	06/10/25	Field	0.6	U	0.9	Yes
251W397	06/26/25	Field	0.7	U	0.9	Yes
Cesium-137						
251W021	04/10/25	Field	-1.0	U	2.4	Yes
251W262	05/12/25	Field	-0.2	U	2.4	Yes
251W318	05/19/25	Field	0.2	U	1.8	Yes
251W363	06/10/25	Field	1.8	U	2.4	Yes
251W397	06/26/25	Field	0.5	U	1.8	Yes
Tritium (standard method)						
251W023	04/10/25	Field	10	U	90	Yes
251W263	05/12/25	Field	14	U	90	Yes
251W320	05/19/25	Field	-41	U	90	Yes
251W364	06/10/25	Field	-7	U	90	Yes
251W398	06/26/25	Field	-82	U	90	Yes
Tritium (low-level method)						
None	-	-	-	-	-	-
Strontium-90						
251W319	05/19/25	Field	-0.057	U	0.648	Yes
Uranium-234						
None	-	-	-	-	-	-
Uranium-235						
None	-	-	-	-	-	-
Uranium-238						
None	-	-	-	-	-	-
Technetium-99						
251W022	04/10/25	Field	-0.282	U	0.810	Yes

Concentrations are expressed in pCi/L with associated uncertainty (3 SD).

A blank sample result is acceptable if it is less than three standard deviations (3 SD) of the result. **Bold** concentrations are positive detections, greater than or equal to 3 SD.
Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.

Table 32. Blank analysis results (µg/L) for metals in water, second quarter, 2025.

Sample Number	Sample Date	Blank Type	Arsenic	Barium	Chromium	Iron	Lead	Manganese	Selenium	Zinc
251W025	04/10/25	Field	-	-	0.2J	-	-	-	-	-
251W366	06/10/25	Field	<2.0	<1.0	<1.0	<10	<1.0	<1.0	-	-
251W400	06/26/25	Field	-	-	<1.0	-	-	-	-	-
251W322	05/19/25	Field	-	-	0.2J	-	-	-	-	-

Blank results less than MDL (method detection limit) are acceptable and reported as <RDL (<reporting detection limit).
Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.

Table 33. Blank analysis results (mg/L) for common ions and nutrients in water, second quarter, 2025.

Sample Number	Sample Date	Blank Type	Calcium	Magnesium	Sodium	Potassium	Fluoride	Chloride	Sulfate	Alkalinity†	NO_3+NO_2*	Total Phosphorus
251W024, 026	04/10/25	Field	-	-	-	-	-	<0.4	<0.8	<1.0	<0.01	-
251W365, 366, 367	06/10/25	Field	<0.1	<0.1	<0.1	<0.1	-	<0.4	<0.8	<1.0	<0.01	-
251W399, 401	06/26/25	Field	-	-	-	-	-	<0.4	<0.8	<1.0	<0.01	-
251W321, 323	05/19/25	Field	-	-	-	-	-	<0.4	<0.8	<1.0	<0.01	-

† As $CaCO_3$.
* As N.
Blank results less than MDL (method detection limit) are acceptable and reported as <RDL (<reporting detection limit).
Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.

Table 34. Blank analysis results (µg/L) for VOCs in water, second quarter, 2025.

Sample Number	Sample Date	Blank Type	PCE	TCE	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride	1,1-DCA	Carbon Tetrachloride	Methylene Chloride	Chloro-form	Chloro-methane	MEK
251W019	04/07/25	Field	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
251W020	04/15/25	Field	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
251W249	05/06/25	Field	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
251W368	06/10/25	Field	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.43 J	<10

Abbreviations: PCE = tetrachloroethene; TCE = trichloroethene; 1,1-DCE = 1,1-dichloroethene; cis-1,2-DCE = cis-1,2-dichloroethene; trans-1,2-DCE = trans-1,2-dichloroethene; 1,1-DCA = 1,1-dichloroethane
MEK = Methyl Ethyl Ketone.
Blank results less than MDL (method detection limit) are acceptable and reported as <RDL (<reporting detection limit).
Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.

Table 35. Duplicate sample results for gamma emitters from monthly composited 8x10-inch TSP air filters, second quarter, 2025.

Month and Nuclide	Original Sample ID	Concentration (R_1)		1 SD_1	Duplicate Sample ID	Concentration (R_2)		1 SD_2	RPD (%)	$\lvert R_1-R_2 \rvert$	$3(SD_1^2+SD_2^2)^{1/2}$	Within either criterion?
April 2025												
^{7}Be	Idaho Falls	**139.7**	-	4.7	Idaho Falls Dup	**145.5**	-	2.7	-4	5.8	16.3	Yes
$^{106}Ru/^{106}Rh$		-0.27	U	0.28		0.25	U	0.27	5200	0.54	1.16	Yes
^{125}Sb		-0.02	U	0.03		-0.04	U	0.04	-67	0.02	0.11	Yes
^{134}Cs		-0.01	U	0.02		0.02	U	0.02	-600	0.03	0.08	Yes
^{137}Cs		0.03	U	0.02		0.05	U	0.02	-50	0.02	0.08	Yes
May 2025												
^{7}Be	Idaho Falls	**117.9**	-	2.2	Idaho Falls Dup	**121.8**	-	4.1	-3	3.9	14.0	Yes
$^{106}Ru/^{106}Rh$		-0.01	U	0.19		0.04	U	0.27	-333	0.05	0.99	Yes
^{125}Sb		0.01	U	0.04		0.03	U	0.03	-100	0.02	0.15	Yes
^{134}Cs		0.02	U	0.01		0.00	U	0.01	200	0.02	0.04	Yes
^{137}Cs		0.00	U	0.01		0.01	U	0.01	-200	0.01	0.04	Yes
June 2025												
^{7}Be	Idaho Falls	**154.4**	-	2.8	Idaho Falls Dup	**155.7**	-	2.9	-1	1.3	12.1	Yes
$^{106}Ru/^{106}Rh$		-0.25	U	0.22		0.19	U	0.26	1467	0.44	1.02	Yes
^{125}Sb		0.07	U	0.05		0.03	U	0.06	80	0.04	0.23	Yes
^{134}Cs		-0.01	U	0.01		0.02	U	0.01	-600	0.03	0.04	Yes
^{137}Cs		0.02	U	0.02		0.04	U	0.02	-67	0.02	0.08	Yes

Air concentrations and uncertainties (1 SD) are expressed in units of 10^{-3} pCi/m^3. **Bold** concentrations are positive detections, greater than or equal to 3 SD.
Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.
Criteria for duplicate agreement: RPD (relative percent difference) within ± 20% or $\lvert R_1-R_2 \rvert \leq 3(SD_1^2+SD_2^2)^{1/2}$.

Table 36. Duplicate sample results for radiochemical analyses of composited 8x10 inch TSP air filters from the first quarter of 2025.

Nuclide	Original Sample ID	Concentration (R_1)		1 SD_1	Duplicate Sample ID	Concentration (R_2)		1 SD_2	RPD (%)	$\lvert R_1-R_2 \rvert$	$3(SD_1^2+SD_2^2)^{1/2}$	Within either criterion?
$^{89/90}Sr$	Idaho Falls	**1.21**	-	0.22	Idaho Falls Dup	**1.36**	-	0.23	-12	0.15	0.95	Yes
^{238}Pu		0.01	U	0.01		0.03	U	0.02	-100	0.02	0.07	Yes
$^{239}Pu/^{240}Pu$		0.00	U	0.01		0.04	U	0.02	-200	0.04	0.07	Yes
^{241}Am		0.01	U	0.01		0.03	U	0.02	-100	0.02	0.07	Yes

Air concentrations and uncertainties (1 SD) are expressed in units of 10^{-5} pCi/m^3. **Bold** concentrations are positive detections, greater than or equal to 3 SD.
Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.
Criteria for duplicate agreement: RPD (relative percent difference) within ± 20% or $\lvert R_1-R_2 \rvert \leq 3(SD_1^2+SD_2^2)^{1/2}$.

Table 37. Duplicate results for quarterly average EcoGamma readings (µR/hr) for the second quarter of 2025.

Primary EcoGamma ID	Quarterly Average (R_1) and {Median}	1 SD_1	Duplicate EcoGamma ID	Quarterly Average (R_2) and {Median}	1 SD_2	RPD (%)	$\lvert R_1-R_2 \rvert$	$3(SD_1^2+SD_2^2)^{1/2}$	Within either criterion?
Big Southern Butte	14.3 {14.3}	0.6	Big Southern Butte DUP	13.7 {13.6)	0.6	5	0.6	2.6	Yes

Criteria for duplicate agreement: RPD (relative percent difference) within ± 20% or $\lvert R_1-R_2 \rvert \leq 3(SD_1^2+SD_2^2)^{1/2}$.
RPD = relative percent difference.

Table 38. Duplicate sample results (pCi/L) for radiological constituents in groundwater and/or surface water, second quarter, 2025.

Analysis/Sample Location	Original Sample Number	Concentration (R_1)		1 SD_1	Duplicate Sample Number	Concentration (R_2)		1 SD_2	RPD (%)	$\lvert R_1-R_2 \rvert$	$3(SD_1^2+SD_2^2)^{1/2}$	Within either criterion?
Gross Alpha												
P&W-2	251W091	**2.0**	-	0.4	251W228	**1.8**	-	0.4	11	0.2	1.7	Yes
TAN-2271	251W096	1.3	U	0.6	251W233	1.4	U	0.7	-7	0.1	2.8	Yes
M6S	251W290	**1.5**	-	0.4	251W291	0.7	U	0.3	73	0.8	1.5	Yes
MV-27	251W348	0.4	U	0.5	251W358	1.0	U	0.4	-70	0.6	1.9	Yes
USGS-132	251W412	1.0	U	0.4	251W452	**1.3**	-	0.4	-26	0.3	1.7	Yes
Gross Beta												
P&W-2	251W091	**2.5**	-	0.4	251W228	**1.5**	-	0.4	50	1.0	1.7	Yes
TAN-2271	251W096	**434.6**	-	3.2	251W233	**407.5**	-	3.6	6	27.1	14.4	Yes
M6S	251W290	**2.6**	-	0.4	251W291	**2.5**	-	0.4	4	0.1	1.7	Yes
MV-27	251W348	**3.7**	-	0.5	251W358	**3.4**	-	0.4	8	0.3	1.9	Yes
USGS-132	251W412	**1.7**	-	0.4	251W452	**1.9**	-	0.4	-11	0.2	1.7	Yes
Cesium-137												
P&W-2	251W091	1.0	U	0.9	251W228	-0.5	U	0.7	600	1.5	3.4	Yes
TAN-2271	251W096	1.5	U	0.7	251W233	-0.5	U	0.8	400	2.0	3.2	Yes
M6S	251W290	0.7	U	0.9	251W291	0.4	U	0.5	55	0.3	3.1	Yes
MV-27	251W348	0.7	U	0.8	251W358	0.4	U	0.7	55	0.3	3.2	Yes
USGS-132	251W412	0.2	U	0.6	251W452	-0.2	U	0.5	NA	0.4	2.3	Yes
Tritium (standard method)												
P&W-2	251W092	0	U	30	251W229	-40	U	30	-200	40	127	Yes
TAN-2271	251W098	**310**	-	40	251W235	**340**	-	40	-9	30	170	Yes
M6S	251W298	-10	U	30	251W299	20	U	30	-600	30	127	Yes
MV-27	251W349	10	U	30	251W359	0	U	30	200	10	127	Yes
USGS-132	251W458	78	U	35	251W513	61	U	35	24	17	145	Yes
Tritium (low-level method)												
M6S	251W298	**6**	-	2	251W299	1	U	2	143	5	8	Yes
MV-27	251W349	**8**	-	2	251W359	**7**	-	2	13	1	8	Yes
USGS-132	251W458	**125**	-	3	251W513	**132**	-	3	-5	7	13	Yes
Strontium-90												
TAN-2271	251W097	**273**	-	11.7	251W234	**280**	-	11.9	-3	7	50	Yes
Technetium-99												
None	-	-	-	-	-	-	-	-	-	-	-	-
Uranium-234												
M6S	251W300	**1.28**	-	0.10	251W301	**1.52**	-	0.33	-17	0.24	1.03	Yes
Uranium-235												
M6S	251W300	0.0274	U	0.0138	251W301	0.0500	U	0.0929	-584	0.0226	0.282	Yes

Uranium-238												
M6S	251W300	**0.663**	-	0.067	251W301	**0.728**	-	0.232	-9	0.065	0.724	Yes
Plutonium-238												
M6S	251W294	0.0022	U	0.0038	251W295	-0.0088	U	0.0153	-333	0.0110	0.0473	Yes
Plutonium-239/240												
M6S	251W294	0.0000	U	0.0022	251W295	0.0088	U	0.0088	-200	0.0088	0.0272	Yes
Americium-241												
M6S	251W292	0.0043	U	0.0074	251W293	0.0158	U	0.0080	-114	0.0115	0.0327	Yes

Bold concentrations are positive detections, greater than or equal to 3 SD.

Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.

Criteria for duplicate agreement: RPD (relative percent difference) within ± 20% or $|R_1-R_2| \leq 3(SD_1^2+SD_2^2)^{1/2}$.

Table 39. Duplicate sample results for metals (µg/L) in groundwater, second quarter, 2025.

Sample Location	Sample Number	Sample Date	Arsenic	Barium	Chromium	Iron	Lead	Manganese	Selenium	Zinc
TAN-2271	251W100	04/16/25	1.2 J	510	1.8	2400	<1.0	910	-	-
TAN-2271	251W237	04/16/25	1.2 J	510	1.6	2400	<1.0	880	-	-
RPD (%)			**0.0**	**0.0**	**4.1**	**0.0**	**0.0**	**3.3**	**-**	**-**
P&W-2	251W094	04/21/25	-	-	2.3	-	-	-	-	-
P&W-2	251W230	04/21/25	-	-	2.3	-	-	-	-	-
RPD (%)			**-**	**-**	**0.0**	**-**	**-**	**-**	**-**	**-**
M6S	251W306	05/05/25	-	-	26	-	-	-	-	-
M6S	251W303	05/05/25	-	-	26	-	-	-	-	-
RPD (%)			**-**	**-**	**0.0**	**-**	**-**	**-**	**-**	**-**
MV-27	251W351	05/29/25	-	-	1.5	-	-	-	-	-
MV-27	251W361	05/29/25	-	-	1.5	-	-	-	-	-
RPD (%)					**0.0**					
USGS-132	251W415	06/18/25	-	-	7.9	-	-	-	-	-
USGS-132	251W455	06/18/25	-	-	7.9	-	-	-	-	-
RPD (%)					**0.0**					

Criteria for duplicate agreement: RPD (relative percent difference) within ± 20%. If one or both sample results are less than five times the RDL (reporting detection limit), the results agree if their absolute difference is less than or equal to the RDL.

Table 40. Duplicate sample results for common ions and nutrients (mg/L) in groundwater, second quarter, 2025.

Sample Location	Sample Number	Sample Date	Calcium	Magnesium	Sodium	Potassium	Chloride	Sulfate	Total Alkalinity†	Total Nitrogen	Total Phosphorus
TAN-2271	251W099, 100, 101	04/16/25	57	49	100	7.9	98.7	41.0	414	0.0042 J	-
TAN-2271	251W236, 237, 238	04/16/25	57	49	100	7.9	98.0	41.2	409	0.0043 J	-
RPD (%)			**0.0**	**0.0**	**0.0**	**0.0**	**0.7**	**-0.5**	**1.2**	**-2.3**	**-**
P&W-2	251W093, 095	04/21/25	-	-	-	-	8.97	30.6	140	0.52	-
P&W-2	251W230, 232	04/21/25	-	-	-	-	8.97	30.7	141	0.52	-
RPD (%)			**-**	**-**	**-**	**-**	**0.0**	**-0.3**	**-0.7**	**0.0**	**-**
M6S	251W302, 308	05/05/25	-	-	-	-	27.0	77.3	92.9	2.0	-
M6S	251W303, 309	05/05/25	-	-	-	-	27.2	77.7	93.9	2.1	-
RPD (%)							**-0.7**	**-0.5**	**-1.1**	**-4.9**	**-**
MV-27	251W350, 352	05/29/25	-	-	-	-	52.2	66.1	179	2.6	-
MV-27	251W360, 362	05/29/25	-	-	-	-	52.3	66.0	180	2.6	-
RPD (%)							**0.2**	**0.1**	**0.6**	**0.0**	
USGS-132	251W414, 416	06/18/25	-	-	-	-	11.3	25.2	143	0.73	-
USGS-132	251W454, 456	06/18/25	-	-	-	-	11.3	25.2	141	0.73	-
RPD (%)							**0.0**	**0.0**	**1.4**	**0.0**	

†As $CaCO_3$.

Criteria for duplicate agreement: RPD (relative percent difference) within ± 20%. If one or both sample results are less than five times the RDL (reporting detection limit), the results agree if their absolute difference is less than or equal to the RDL.

Table 41. Duplicate sample results (µg/L) for VOCs in water, second quarter, 2025.

Location	Sample Number	Sample Date	PCE	TCE	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride	1,1-DCA	Carbon Tetrachloride	Methylene Chloride	Chloro-methane	Styrene	Chloro-form	MEK
M6S	251W310	05/05/25	<0.5	0.83	<0.5	<0.5	<0.5	<0.5	<0.5	2.93	<0.5	<0.5	<0.5	0.49 J	<10
M6S	251W311	05/05/25	<0.5	0.93	<0.5	<0.5	<0.5	<0.5	<0.5	2.89	<0.5	<0.5	<0.5	0.54	<10
RPD (%)			**0.0**	**-11.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**1.4**	**0.0**	**0.0**	**0.0**	**-9.7**	**0.0**
TAN-2271	251W102	04/16/25	<0.5	0.76	<0.5	2.48	96.8	3.81	0.44	<0.5	<0.5	<0.5	<0.5	<0.5	<10
TAN-2271	251W239	04/16/25	<0.5	0.83	<0.5	2.53	105	4.29	0.43	<0.5	<0.5	<0.5	<0.5	<0.5	<10
RPD (%)			**0.0**	**-8.8**	**0.0**	**-2.0**	**-8.1**	**-11.8**	**2.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

RPD = relative percent difference.

Abbreviations: PCE = tetrachloroethene; TCE = trichloroethene; 1,1-DCE = 1,1-dichloroethene; cis-1,2-DCE = cis-1,2-dichloroethene; trans-1,2-DCE = trans-1,2-dichloroethene; 1,1-DCA = 1,1-dichloroethane, MEK = Methyl Ethyl Ketone (2-Butanone).

Criteria for duplicate agreement: RPD (relative percent difference) within ± 20%. If one or both sample results are less than five times the RDL (reporting detection limit), the results agree if their absolute difference is less than or equal to the RDL.

Table 42. Spiked sample results (µg/L) for metals in water, second quarter, 2025.

Sample Number	Sample Date	Barium			Chromium			Lead			Manganese			Zinc		
		Spike	Result	%R	Spike	Result	%R	Spike	Result	%R	Spike	Result	%R	Spike	Result	%R
251W241	4/16/2025				72.8	75	103									

A percent recovery (%R) of 100 ± 25% is considered acceptable.

Table 43. Spiked sample results (mg/L) for common ions and nutrients in water, second quarter, 2025.

Sample Number	Sample Date	Chloride			Sulfate			Total Alkalinity			$NO_3 + NO_2$*			Total Phosphorus		
		Spike	Result	%R	Spike	Result	%R	Spike	Result	%R	Spike	Result	%R	Spike	Result	%R
251W240, 242	4/16/2025	62.1	64.8	104	27.3	28.3	104	78.2	77.8	99	2.99	3.1	104	-	-	-

*As N.

A percent recovery (%R) of 100 ± 25% is considered acceptable

Table 44. Spiked sample results (µg/L) for VOCs in water, second quarter, 2025.

Sample Number	Sample Date	Carbon Tetrachloride			Styrene			Tetrachloroethene			Trichloroethene			Vinyl Chloride		
		Spike	Result	%R	Spike	Result	%R	Spike	Result	%R	Spike	Result	%R	Spike	Result	%R
251W243	04/16/25	8.75	8.12	93	19.3	14.2	74	19.3	18.3	95	11.0	11.7	106	7.80	8.68	111

Table 44 continued. Spiked sample results (µg/L) for VOCs in water, second quarter, 2025.

Sample Number	Sample Date	1,1-Dichloroethene			trans-1,2-Dichloroethene			cis-1,2-Dichloroethene			1,2-Dichloroethane			Methylene Chloride		
		Spike	Result	%R	Spike	Result	%R	Spike	Result	%R	Spike	Result	%R	Spike	Result	%R
251W243	04/16/25	17.5	20.2	115	11.9	14.3	120	14.7	12.8	87	10.7	11.6	108	5.89	8.84	150

A percent recovery (%R) of 100 ± 25% is considered acceptable.

Table 45. ISU-EML electret ionization chamber (EIC) irradiation results (categorized as spiked samples), second quarter, 2025.

Electret #	Exposure Received		Net Measured Exposure[1]		%R	Within Spec?
	(mR)	Uncertainty (1 SD, mR)	(mR)	Uncertainty (1 SD, mR)		
SMV054	40.0	1.4	39.6	1.3	99.0	Yes
SMV026	40.0	1.4	41.4	1.3	103.6	Yes
SNQ159	40.0	1.4	39.9	1.4	99.8	Yes
				Triplicate AVG:	**100.8**	**Yes**
SMV273	30.10	1.1	28.5	1.3	94.7	Yes
SMV236	30.10	1.1	29.3	1.3	97.4	Yes
SNQ141	30.10	1.1	26.8	1.4	89.1	Yes
				Triplicate AVG:	**93.7**	**Yes**
SMD396	20.60	0.7	22.1	1.3	107.4	Yes
SNQ108	20.60	0.7	20.7	1.4	100.3	Yes
SMV063	20.60	0.7	20.5	1.3	99.6	Yes
				Triplicate AVG:	**102.4**	**Yes**

A percent recovery (%R) of 100 ± 25% is considered acceptable.

[1] Net measured exposure estimate includes a correction for atmospheric pressure.

Table 46. Air sampling field equipment service reliability (percent operational), second quarter, 2025.

Station Locations	Sample Type				
	47-mm TSP	8x10-inch TSP	Radioiodine	Atmospheric Moisture	Precipitation
Onsite Locations					
Big Lost River Rest Area	100%	100%	100%	100%	100%
Experimental Field Station	100%	100%	100%	100%	NC[1]
MFC[4] Guard House	100%	100%	100%	100%	NC[1]
Sand Dunes Tower	100%	100%	100%	100%	NC[1]
Van Buren Avenue	100%	100%	100%	100%	NC[1]
Boundary Locations					
Atomic City	100%	100%	100%	100%	100%
Howe	100%	100%	100%	100%	100%
Monteview	100%	100%	100%	100%	100%
Mud Lake	100%	100%	100%	100%	100%
Distant Locations[2]					
Craters of the Moon	100%	100%	100%	100%	NC[1]
Idaho Falls	100%	100%	100%	100%	100%
Idaho Falls Duplicate[3]	NC[1]	100%	-	-	-

Note: The values in this table were calculated by dividing the number of weeks the equipment was in operation by the number of weeks in the quarter.

[1] NC = Sample not collected at this location.

[2] Fort Hall Station, operated by the Shoshone-Bannock Tribes, is not included here.

[3] A duplicate 8x10-inch filter TSP sampler is currently installed at the Idaho Falls location.

[4] Materials and Fuels Complex.

Appendix A

Table A-1. Weekly concentrations (in 1 x 10^{-3} pCi/m^3) for gross alpha and gross beta analyses of 47-mm TSP filters for all locations, second quarter, 2025.

Sample Location	Collection Date		Gross Alpha		Gross Beta	
	Start	Stop	Concentration	1 SD	Concentration	1 SD
On-Site Locations						
Big Lost River Rest Area	03/27/25	04/03/25	**0.8**	0.2	**13.6**	0.5
	04/03/25	04/10/25	**1.2**	0.2	**24.0**	0.7
	04/10/25	04/17/25	**1.4**	0.2	**27.9**	0.7
	04/17/25	04/24/25	**0.7**	0.2	**18.5**	0.6
	04/24/25	05/01/25	**0.6**	0.2	**20.5**	0.6
	05/01/25	05/08/25	**1.6 J**[4]	0.3	**28.2 J**[4]	0.9
	05/08/25	05/15/25	**0.7**	0.2	**18.7**	0.6
	05/15/25	05/22/25	**0.9**	0.2	**14.0**	0.6
	05/22/25	05/29/25	**1.3**	0.2	**27.1**	0.7
	05/29/25	06/05/25	**1.1**	0.2	**25.2**	0.7
	06/05/25	06/12/25	**1.2**	0.2	**22.0**	0.6
	06/12/25	06/18/25[2]	**1.2**	0.2	**28.6**	0.8
	06/19/25	06/26/25[3]	**0.6**	0.2	**18.7**	0.5
Experimental Field Station	03/27/25	04/03/25	**1.0**	0.2	**13.1**	0.5
	04/03/25	04/10/25	**1.3**	0.2	**23.6**	0.7
	04/10/25	04/17/25	**1.3**	0.2	**27.4**	0.7
	04/17/25	04/24/25	**0.6**	0.2	**20.2**	0.6
	04/24/25	05/01/25	**0.6**	0.2	**19.7**	0.6
	05/01/25	05/08/25	**0.7**	0.2	**18.0**	0.6
	05/08/25	05/15/25	**0.6**	0.2	**20.6**	0.6
	05/15/25	05/22/25	**0.8**	0.2	**13.4**	0.6
	05/22/25	05/29/25	**0.9**	0.2	**25.7**	0.7
	05/29/25	06/05/25	**1.4**	0.2	**24.0**	0.6
	06/05/25	06/12/25	**1.3**	0.2	**21.8**	0.6
	06/12/25	06/18/25[2]	**1.4**	0.2	**29.0**	0.8
	06/19/25	06/26/25[3]	**1.2**	0.2	**19.0**	0.6
MFC[5] Guard House	03/27/25	04/03/25	**0.8**	0.2	**12.2**	0.5
	04/03/25	04/10/25	**1.3**	0.2	**22.3**	0.6
	04/10/25	04/17/25	**2.1**	0.2	**25.7**	0.7
	04/17/25	04/24/25	**1.1**	0.2	**18.4**	0.6
	04/24/25	05/01/25	0.4	0.2	**18.1**	0.6
	05/01/25	05/08/25	**1.1**	0.2	**17.6**	0.6
	05/08/25	05/15/25	**0.9**	0.2	**19.5**	0.6
	05/15/25	05/22/25	**1.0**	0.2	**14.6**	0.6
	05/22/25	05/29/25	**1.1**	0.2	**24.2**	0.7
	05/29/25	06/05/25	**1.2**	0.2	**22.7**	0.6
	06/05/25	06/12/25	**0.9**	0.2	**20.0**	0.6
	06/12/25	06/18/25[2]	**0.9**	0.2	**28.1**	0.7
	06/19/25	06/26/25[3]	**0.9**	0.2	**18.8**	0.5
Sand Dunes Tower	03/27/25	04/03/25	**0.7**	0.2	**12.4**	0.5
	04/03/25	04/10/25	**1.0**	0.2	**24.5**	0.7
	04/10/25	04/17/25	**1.5**	0.2	**25.2**	0.7
	04/17/25	04/24/25	**1.0**	0.2	**20.8**	0.6
	04/24/25	05/01/25	**0.6**	0.2	**21.0**	0.6
	05/01/25	05/08/25	**0.9**	0.2	**18.5**	0.6
	05/08/25	05/15/25	0.4	0.2	**19.7**	0.6
	05/15/25	05/22/25	0.5	0.2	**12.4**	0.5
	05/22/25	05/29/25	**0.8**	0.2	**26.5**	0.7
	05/29/25	06/05/25	**0.9**	0.2	**25.3**	0.7
	06/05/25	06/12/25	**1.3**	0.2	**21.6**	0.6
	06/12/25	06/18/25[2]	**1.4**	0.2	**26.6**	0.7
	06/19/25	06/26/25[3]	**1.1**	0.2	**18.7**	0.6

Table A-1 continued. Weekly concentrations (in 1 x 10^{-3} pCi/m^3) for gross alpha and gross beta analyses of 47-mm TSP filters for all locations, second quarter, 2025.

Sample Location	Collection Date		Gross Alpha		Gross Beta	
	Start	Stop	Concentration	1 SD	Concentration	1 SD
Van Buren Avenue	03/27/25	04/03/25	**0.9**	0.2	**14.4**	0.6
	04/03/25	04/10/25	**0.8**	0.2	**26.4**	0.7
	04/10/25	04/17/25	**1.5**	0.2	**30.2**	0.8
	04/17/25	04/24/25	**1.0**	0.2	**22.9**	0.7
	04/24/25	05/01/25	**0.9**	0.2	**21.0**	0.7
	05/01/25	05/08/25	**1.2**	0.2	**21.0**	0.7
	05/08/25	05/15/25	**0.8**	0.2	**22.3**	0.7
	05/15/25	05/22/25	0.5	0.2	**15.9**	0.6
	05/22/25	05/29/25	**1.2**	0.2	**29.1**	0.8
	05/29/25	06/05/25	**1.2**	0.2	**28.1**	0.7
	06/05/25	06/12/25	**1.1**	0.2	**24.0**	0.7
	06/12/25	06/18/25[2]	**1.3**	0.2	**34.1**	0.9
	06/19/25	06/26/25[3]	**1.0**	0.2	**20.8**	0.6
Boundary Locations						
Atomic City	03/27/25	04/03/25	**1.1**	0.2	**14.2**	0.5
	04/03/25	04/10/25	**1.4**	0.2	**24.6**	0.7
	04/10/25	04/17/25	**2.3**	0.2	**28.3**	0.7
	04/17/25	04/24/25	**1.3**	0.2	**20.4**	0.6
	04/24/25	05/01/25	**0.9**	0.2	**17.1**	0.6
	05/01/25	05/08/25	**1.6**	0.2	**17.7**	0.6
	05/08/25	05/15/25	**1.2**	0.2	**18.7**	0.6
	05/15/25	05/22/25	**1.7**	0.2	**15.4**	0.6
	05/22/25	05/29/25	**1.5**	0.2	**26.6**	0.7
	05/29/25	06/05/25	**1.5**	0.2	**23.0**	0.6
	06/05/25	06/12/25	**1.0**	0.2	**21.2**	0.6
	06/12/25	06/18/25[2]	**2.1**	0.3	**28.0**	0.7
	06/19/25	06/26/25[3]	**1.5**	0.2	**19.8**	0.6
Howe	03/27/25	04/03/25	0.5 J[4]	0.2	**14.3 J[4]**	0.5
	04/03/25	04/10/25	**1.2 J[4]**	0.2	**25.7 J[4]**	0.7
	04/10/25	04/17/25	**1.5 J[4]**	0.2	**27.1 J[4]**	0.7
	04/17/25	04/24/25	**1.0 J[4]**	0.2	**20.6 J[4]**	0.6
	04/24/25	05/01/25	**0.7 J[4]**	0.2	**20.8 J[4]**	0.6
	05/01/25	05/08/25	**1.3 J[4]**	0.2	**21.3 J[4]**	0.6
	05/08/25	05/15/25	**1.0 J[4]**	0.2	**20.7 J[4]**	0.6
	05/15/25	05/22/25	**0.8 J[4]**	0.2	**16.1 J[4]**	0.6
	05/22/25	05/29/25	**1.2 J[4]**	0.2	**26.6 J[4]**	0.7
	05/29/25	06/05/25	**1.2 J[4]**	0.2	**26.6 J[4]**	0.7
	06/05/25	06/12/25	**1.3 J[4]**	0.2	**19.9 J[4]**	0.6
	06/12/25	06/18/25[2]	**1.5 J[4]**	0.2	**27.1 J[4]**	0.8
	06/19/25	06/26/25[3]	**1.0 J[4]**	0.2	**17.4 J[4]**	0.5

Table A-1 continued. Weekly concentrations (in 1 x 10^{-3} pCi/m^3) for gross alpha and gross beta analyses for 47-mm TSP filters for all locations, second quarter, 2025.

Sample Location	Collection Date		Gross Alpha		Gross Beta	
	Start	Stop	Concentration	1 SD	Concentration	1 SD
Monteview	03/27/25	04/03/25	**0.8**	0.2	**13.7**	0.5
	04/03/25	04/10/25	**1.1**	0.2	**23.6**	0.6
	04/10/25	04/17/25	**1.5**	0.2	**27.5**	0.7
	04/17/25	04/24/25	**1.5 J**[4]	0.3	**24.5 J**[4]	0.8
	04/24/25	05/01/25	**0.6**	0.2	**19.0**	0.6
	05/01/25	05/08/25	**0.8**	0.2	**17.1**	0.6
	05/08/25	05/15/25	**0.7**	0.2	**19.2**	0.6
	05/15/25	05/22/25	0.4	0.2	**13.2**	0.5
	05/22/25	05/29/25	**0.7**	0.2	**22.7**	0.6
	05/29/25	06/05/25	**0.9**	0.2	**23.2**	0.6
	06/05/25	06/12/25	**1.0**	0.2	**17.8**	0.6
	06/12/25	06/18/25[2]	**1.3**	0.2	**26.6**	0.7
	06/19/25	06/26/25[3]	**0.9**	0.2	**17.9**	0.5
Mud Lake	03/27/25	04/03/25	**0.9**	0.2	**13.7**	0.5
	04/03/25	04/10/25	**1.3**	0.2	**22.6**	0.6
	04/10/25	04/17/25	**1.8**	0.2	**26.0**	0.7
	04/17/25	04/24/25	**0.9**	0.2	**18.9**	0.6
	04/24/25	05/01/25	**0.7**	0.2	**19.6**	0.6
	05/01/25	05/08/25	**0.9**	0.2	**16.7**	0.6
	05/08/25	05/15/25	**0.9**	0.2	**19.0**	0.6
	05/15/25	05/22/25	**1.0**	0.2	**14.2**	0.5
	05/22/25	05/29/25	0.4	0.2	**22.7**	0.6
	05/29/25	06/05/25	**0.9**	0.2	**21.4**	0.6
	06/05/25	06/12/25	**1.4**	0.2	**20.1**	0.6
	06/12/25	06/18/25[2]	**0.9**	0.2	**23.6**	0.7
	06/19/25	06/26/25[3]	**1.0**	0.2	**18.0**	0.5
Distant Locations						
Craters of the Moon	03/27/25	04/03/25	**0.7**	0.2	**10.8**	0.5
	04/03/25	04/10/25	**0.6**	0.2	**22.8**	0.6
	04/10/25	04/17/25	**0.8**	0.2	**23.4**	0.6
	04/17/25	04/24/25	**0.8**	0.2	**18.7**	0.6
	04/24/25	05/01/25	**1.2**	0.2	**20.4**	0.6
	05/01/25	05/08/25	**0.9**	0.2	**16.9**	0.6
	05/08/25	05/15/25	0.5	0.2	**17.2**	0.6
	05/15/25	05/22/25	0.4	0.2	**13.2**	0.5
	05/22/25	05/29/25	**0.9**	0.2	**23.9**	0.6
	05/29/25	06/05/25	**0.8**	0.2	**23.1**	0.6
	06/05/25	06/12/25	**1.6**	0.2	**20.6**	0.6
	06/12/25	06/18/25[2]	**1.3**	0.2	**25.7**	0.7
	06/19/25	06/26/25[3]	**0.8**	0.2	**15.5**	0.5

Table A-1 continued. Weekly concentrations (in 1 x 10^{-3} pCi/m^3) for gross alpha and gross beta analyses of 47-mm TSP filters for all locations, second quarter, 2025.

Sample Location	Collection Date		Gross Alpha		Gross Beta	
	Start	Stop	Concentration	1 SD	Concentration	1 SD
Fort Hall[2]	03/27/25	04/03/25	**1.0**	0.2	**11.9**	0.5
	04/03/25	04/10/25	**1.1**	0.2	**21.4**	0.7
	04/10/25	04/17/25	**2.2**	0.2	**28.6**	0.7
	04/17/25	04/24/25	**1.1**	0.2	**19.6**	0.6
	04/24/25	05/01/25	0.5	0.2	**19.0**	0.6
	05/01/25	05/08/25	**0.8**	0.2	**16.0**	0.6
	05/08/25	05/15/25	**0.9**	0.2	**20.5**	0.7
	05/15/25	05/22/25	0.5	0.2	**16.5**	0.6
	05/22/25	05/29/25	**1.8**	0.2	**23.7**	0.7
	05/29/25	06/05/25	**1.5**	0.2	**22.7**	0.6
	06/05/25	06/12/25	**1.6**	0.2	**20.8**	0.6
	06/12/25	06/18/25[2]	**1.6**	0.2	**27.9**	0.7
	06/19/25	06/26/25[3]	**1.2**	0.2	**17.0**	0.5
Idaho Falls	03/27/25	04/03/25	**1.5**	0.2	**12.8**	0.5
	04/03/25	04/10/25	**1.4**	0.2	**23.0**	0.6
	04/10/25	04/17/25	**1.9**	0.2	**26.3**	0.7
	04/17/25	04/24/25	**0.8**	0.2	**20.1**	0.6
	04/24/25	05/01/25	**1.4**	0.2	**20.3**	0.6
	05/01/25	05/08/25	**1.5**	0.2	**18.2**	0.6
	05/08/25	05/15/25	**1.0**	0.2	**21.1**	0.7
	05/15/25	05/22/25	**0.7**	0.2	**14.6**	0.6
	05/22/25	05/29/25	**1.1**	0.2	**24.1**	0.7
	05/29/25	06/05/25	**0.9**	0.2	**22.8**	0.6
	06/05/25	06/12/25	**1.6**	0.2	**20.3**	0.6
	06/12/25	06/18/25[2]	**1.8**	0.3	**29.1**	0.8
	06/19/25	06/26/25[3]	**1.2**	0.2	**18.6**	0.6

Note: **Bold** concentrations are positive detections, greater or equal to 3 SD.
[1]Operated by Shoshone-Bannock Tribes.
[2]Sample was collected a day early due to holiday.
[3]Sample was collected a day later due to holiday.
[4] Volume is an estimate due to mechanical failure. Result is a usable estimate (J).
[5] Materials and Fuels Complex.

Appendix B

Table B-1. Results for all electret ionization chamber (EIC) locations, second quarter, 2025.

Sample Location	Net Corrected Exposure Rate (μR/hr)[1]	± 2 SD (μR/hr)
On-Site Locations		
Big Lost River Rest Area	13.8	2.0
Van Buren Avenue	11.9	0.8
Experimental Field Station	14.1	1.5
Main Gate	14.8	0.8
Sand Dunes Tower	18.4	0.5
MP276 -20	13.1	1.4
MP274 -20	10.5	1.1
MP272 -20	11.5	0.8
MP270 -20	11.6	0.8
MP268 -20	13.4	1.8
MP266 -20	13.2	1.9
MP264 -20	12.9	0.8
MP270 -20/26	12.0	0.7
MP268 -20/26	13.1	1.0
MP266 -20/26	15.9	1.7
MP263 -20/26	17.1	1.1
MP261 -20/26	12.4	0.8
MP259 -20/26	12.1	0.9
MP256 -20/26	12.9	0.6
MFC (EBR II)	13.3	2.0
EBR I	10.3	0.9
RWMC	11.2	1.5
CFA	13.0	1.8
CITRC (PBF)	12.2	0.7
INTEC	21.5, 21.9	-
ATR (TRA)	13.8	1.0
NRF	14.9	1.0
TAN/SMC	11.2	1.0
MP39-33	12.1	1.8
MP37-33	11.4	1.1
MP35-33	10.8	0.8
MP33-33	15.4	1.7
MP31-33	9.5	0.9
MP29-33	11.7	1.4
MP27-33	11.4	0.8
MP25-33	11.4	0.3
MP23-33	10.0, 11.8	-
Base of Howe	13.5	1.5
Rover	13.9	1.1
T4 North	11.2	0.9
T4 South	13.2	1.0
Boundary Locations		
Atomic City	12.6	2.0
Mud Lake/ Terreton	15.0	2.2
Monteview	11.2	1.6
Howe Met. Tower	13.4	1.3
MP282 -20	12.5	1.7
MP280 -20	12.7	1.7
MP278 -20	14.2	0.3
Mud Lake Bank of Commerce	12.3	2.5

Table B-1. continued. Results for all electret ionization chamber (EIC) locations, second quarter, 2025.

Sample Location	Net Corrected Exposure Rate (μR/hr)[1]	± 2 SD (μR/hr)
MP43-33	15.0	1.7
MP41-33	13.1	1.9
MP21-33	9.9	1.4
MP19-33	13.1	1.3
MP14-33	11.3	1.8
MP11-33	11.5	1.9
MP06-33	12.1	0.5
MP03-33	12.6	1.7
Distant Locations		
Arco	13.2	2.3
Craters of the Moon	15.4	2.8
Taber	12.3	1.1
Blackfoot	11.8	2.1
Fort Hall	11.7	1.3
Idaho Falls	9.2	0.9
Hamer	15.1	2.5
Sugar City	14.2	1.2
Roberts	12.1	1.4
Big Southern Butte	15.0	0.8

[1]Results are the average of triplicate exposure rate measurements with the associated sample variability (1 SD), or the 2 measured exposure rates remaining after removal of an outlying value. One of the triplicate measurements is rejected if it is outside the average of the triplicate measurements ±2 SD of the historical population variability. Typically, the two most consistent measurements are reported, based on judgment of the data analyst.

Appendix C

Table C-1. Summary of the minimum detectable concentrations (MDCs) for radiological analytes and reporting detection limits (RDLs) for non-radiological analytes, together with the EPA Maximum Contaminant Levels (MCLs) and DOE Derived Concentration Standards (DCSs) for comparison.

Media Sampled	Collection Device	Analyte	Typical MDC or RDL range[1]	Units	EPA Limit[2,3]	DOE DCS[4]	Notes
Air							
Total Suspended Particulate	47-mm filters	Gross alpha	$(0.3 – 0.7) \times 10^{-3}$	pCi/m^3	--	0.11	5
		Gross beta	$(1 – 2) \times 10^{-3}$	pCi/m^3	1	9.6	5, 16
		Gamma emitters	$(0.1 – 0.2) \times 10^{-3}$	pCi/m^3 (^{137}Cs)	1.9×10^{-2}	38	
	8x10-inch filter	Gamma emitters	$(0.03 – 0.07) \times 10^{-5}$	pCi/m^3 (^{137}Cs)	1.9×10^{-2}	38	
		Radiochemical:					
		Sr-90	$(0.4 – 0.7) \times 10^{-5}$	pCi/m^3	1.9×10^{-2}	9.6	
		Pu-238	$(0.05 – 0.2) \times 10^{-5}$	pCi/m^3	2.1×10^{-3}	0.12	
		Pu-239/240	$(0.03 – 0.1) \times 10^{-5}$	pCi/m^3	2.0×10^{-3}	0.11	
		Am-241	$(0.2 – 0.4) \times 10^{-5}$	pCi/m^3	1.9×10^{-3}	0.13	
Water Vapor	Desiccant column	Tritium	0.3 – 0.6	pCi/m^3	1.5×10^{3}	1.3×10^{5}	
Gaseous	Charcoal filter	Iodine-131	$(6 – 8) \times 10^{-4}$	pCi/m^3	2.1×10^{-1}	4.5×10^{2}	
Precipitation	Plastic Carboy	Tritium	100 – 140	pCi/L	--	--	6
		Gamma emitters	2 - 3	pCi/L (^{137}Cs)	--	--	6
Water							
Ground water, perched ground water, waste pond effluent, and surface water	Grab or composite	Gross alpha	0.3 – 1.9	pCi/L	15	4.0×10^{2}	
		Gross beta	0.8 – 1.9	pCi/L	4 mrem/yr	1.7×10^{3}	
		Gamma emitters	0.5 – 3.0	pCi/L (^{137}Cs)	200	4.1×10^{3}	
		Tritium – standard analytical method	140 - – 189	pCi/L	20,000	2.6×10^{6}	
		Tritium – low-level analytical method	5 – 15	pCi/L	20,000	2.6×10^{6}	7
		Radiochemical:					
		Sr-90	0– 0.8	pCi/L	8	1.7×10^{3}	
		Tc-99	0.8 – 1.4	pCi/L	900	3.9×10^{5}	
		U-234	0.01 – 0.8	pCi/L	30 µg/L (total U)	1.2×10^{3}	8
		U-235	0.02 – 0.6	pCi/L		1.3×10^{3}	
		U-238	0.01 – 0.7	pCi/L		1.4×10^{3}	
		Pu-238	0.01 – 0.2	pCi/L	15	4.3×10^{2}	9
		Pu-239/240	0.01 – 0.2	pCi/L	15	4.0×10^{2}	9
		Am-241	0.03 – 0.1	pCi/L	15	7.4×10^{2}	9
		I-129	0.002	pCi/L	1	5.7×10^{2}	
		Metals					

Media Sampled	Collection Device	Analyte	Typical MDC or RDL range[1]	Units	EPA Limit[2,3]	DOE DCS[4]	Notes
		Arsenic	2	µg/L	10	--	
		Barium	1	µg/L	2000	--	
		Chromium	1	µg/L	100	--	
		Iron	10	µg/L	300*	--	
		Lead	1	µg/L	15	--	
		Manganese	1	µg/L	50*	--	
		Selenium	2	µg/L	50	--	
		Zinc	5	µg/L	5000*	--	
		Common Ions					
		Alkalinity (as $CaCO_3$)	1.0	mg/L	--	--	
		Calcium	0.1	mg/L	--	--	
		Chloride	0.4	mg/L	250*	--	
		Magnesium	0.1	mg/L	--	--	
		Potassium	0.1	mg/L	--	--	
		Sodium	0.1	mg/L	--	--	
		Sulfate	0.8	mg/L	250*	--	
		Nutrients					
		Nitrate/Nitrite	0.01	mg/L	10 (NO_3^-),1 (NO_2^-)	--	
		Total Phosphorus	0.005	mg/L	--	--	
		Volatile Organics					
		Tetrachloroethene (PCE)	0.5	µg/L	5	--	
		Trichloroethene (TCE)	0.5	µg/L	5	--	
		1,1-Dichloroethene	0.5	µg/L	7	--	
		cis-1,2-dichloroethene	0.5	µg/L	70	--	
		trans-1,2-dichloroethene	0.5	µg/L	100	--	
		Vinyl chloride	0.5	µg/L	2	--	
		Carbon tetrachloride	0.5	µg/L	5	--	
		Chloroform	0.5	µg/L	80	--	10
		Chloromethane	0.5	µg/L	--	--	
		Methylene Chloride	0.5	µg/L	5	--	
		Methyl Ethyl Ketone	10	µg/L	--	--	
		1,1-Dichloroethane	0.5	µg/L	--	--	
Terrestrial							
Milk	Grab or composite	Gamma emitters	4.0	pCi/L (^{131}I)	4.59 x10^3	1.0 x10^4	11
Soil	*in situ*	Gamma emitters	0.02 – 0.03	pCi/g (^{137}Cs)	6.8	6.8	12
	Grab	Gamma emitters	0.09	pCi/g (^{137}Cs)	6.8	6.8	12
Radiation							

Media Sampled	Collection Device	Analyte	Typical MDC or RDL range[1]	Units	EPA Limit[2,3]	DOE DCS[4]	Notes
Ambient	EICs	Gamma Radiation	5	mR	--	100 mrem/yr (103.5 mR/yr)	13, 14,
	EcoGamma	Gamma Radiation	1	µR/hr	--	100 mrem/yr (103,500 µR/yr)	13, 15,

Notes:

1.Minimum Detectable Concentrations (MDCs) are a measure of method/instrument performance. They are not a criterion above which a result is considered a detection. DOE Derived concentration standards (DCS) and EPA Maximum Contaminant Levels (MCLs) are listed here only as reference values for comparison to typical MDC or Reporting Detection Limit (RDL) ranges. The MCLs are the most restrictive and do not necessarily apply to the environmental media sampled. For example, the MCLs for water listed here are the highest levels of contaminants legally allowed in public drinking water systems in Idaho, but most wells sampled by DEQ-INL OP are not used for drinking water.

2. For radionuclides in water - EPA derived concentrations (pCi/l) of Beta and Photon Emitters in Drinking Water Yielding a Dose of 4 mrem/year to the Total Body or to any Critical Organ as defined in NBS Handbook 69. For non-radiological analytes – 40 CFR Part 141: National Primary Drinking Water Regulations. The Maximum Contaminant Levels (MCLs) listed here are the highest levels of contaminants legally allowed in public drinking water systems in Idaho. A * designates a Secondary MCL (SMCL), which is a guideline recommended by the EPA for constituents that may affect the taste, color, or odor of drinking water. The values listed are generally consistent with the Idaho Primary Constituent Standards (PCSs) and Secondary Constituent Standards in IDAPA 58.01.11, Ground Water Quality Rule, Tables II and III.

3. For radionuclides in air – EPA Concentration Levels for Environmental Compliance as defined in 40 CFR 61, subpart H -National Emission Standards for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities, and Appendix E, Table 2.

4. Derived concentration standards (DCS) set by the DOE, represent reference values for radiation exposure. They are based on a radiation dose of 100 mrem/year for exposure through a particular exposure mode such as direct exposure, inhalation, or ingestion of water (DOE-STD-1196-2022).

5. Based on the most restrictive human-made alpha emitter (^{239}Pu) and beta-emitter (^{90}Sr) and the most restrictive absorption type in DOE-STD-1196-2022, Table 7.

6. There are no regulatory standards for precipitation. For comparison only, the EPA MCL is 20,000 pCi/L for tritium and 200 pCi/L for Cs-137.

7. Water samples from locations at which tritium concentrations are too low to be detected by the standard method are re-analyzed for tritium using an electrolytic enrichment method (referred to as the low-level method), which has a minimum detectable concentration (MDC) about ten times lower than the standard method.

8. Example: For natural uranium, 30 µg/L (total U) is equivalent to approximately 10.3 pCi/L U-234, 0.468 pCi/L U-235, and 10.0 pCi/L U-238.

9. There are no specific MCLs for these nuclides. Listed MCLs are the gross alpha activity MCL.

10. MCL is for total trihalomethanes.

11. The Food and Drug Administration derived intervention level for I-131 in milk is 170 Bq/L or 4590 pCi/L. The DOE DCS for I-131 in milk is 1.0 x10^4 pCi/L.

12. Recommended federal screening limit for surface soil is 6.8 pCi/g (NCRP Report No. 129,"Recommended Screening Limits for Contaminated Surface Soil and Review of Factors Relevant to Site-Specific Studies", Table 2.1, Agricultural (AG) land use).

13. Mrem/hr is converted to µR/yr assuming 1.035 R/rad in muscle.

14. The "Typical MDC" for EICs is expressed as the EIC sensitivity for gamma radiation with less than a 10% error, which is 5 mR per the EPERM System Manual.

15. The "Typical MDC" for the EcoGamma is expressed as the lower end of EcoGamma low range.

16. Per the EPA RadNet Sampling and Analyses Schedules, Routine Sample Analyses [for air filters], "If the beta concentration is greater than 1 pCi/m^3, gamma spectroscopy and possibly other analyses are performed."

Appendix D

Table D-1. List of volatile organic compounds (VOCs) analyzed for water samples.

Analyte	Reporting Detection Limit (RDL) (expressed in µg/L)
Benzene	0.5
Carbon tetrachloride	0.5
Chlorobenzene	0.5
1,4-Dichlorobenzene	0.5
1,2-Dichlorobenzene	0.5
1,2-Dichloroethane	0.5
1,1-Dichloroethene	0.5
cis-1,2-Dichloroethene	0.5
trans-1,2-Dichloroethene	0.5
1,2-Dichloropropane	0.5
Ethylbenzene	0.5
Methylene Chloride	0.5
Styrene	0.5
Tetrachloroethene (PCE)	0.5
Toluene	0.5
1,2,4-Trichlorobenzene	0.5
1,1,1-Trichloroethane	0.5
1,1,2-Trichloroethane	0.5
Trichloroethylene	0.5
Vinyl chloride	0.5
Xylenes (total)	0.5
Bromodichloromethane	0.5
Dibromochloromethane	0.5
Bromoform	0.5
Chloroform	0.5
Bromobenzene	0.5
Bromochloromethane	0.5
Bromomethane	0.5
n-Butylbenzene	0.5
sec-Butylbenzene	1.0
tert-Butylbenzene	0.5
Chloroethane	0.5
Chloromethane	0.5
2-Chlorotoluene	0.5

Table D-1 continued. List of volatile organic compounds (VOCs) analyzed for water samples.

Analyte	Reporting Detection Limit (RDL) (expressed in µg/L)
4-Chlorotoluene	0.5
1,2-Dibromo-3-chloropropane (DBCP)	0.5
1,2-Dibromoethane (EDB)	0.5
Dibromomethane	0.5
1,3-Dichlorobenzene	0.5
Dichlorodifluoromethane	0.5
1,1-Dichloroethane	0.5
1,3-Dichloropropane	0.5
2,2-Dichloropropane	0.5
1,1-Dichloropropene	0.5
cis-1,3-Dichloropropene	0.5
trans-1,3-Dichloropropene	1.0
Hexachlorobutadiene	0.5
Isopropylbenzene	0.5
p-Isopropyltoluene	0.5
Methyl Ethyl Ketone (MEK)	10
Methyl Tert Butyl Ether (MTBE)	0.5
Naphthalene	0.5
n-Propylbenzene	0.5
1,1,1,2-Tetrachloroethane	0.5
1,1,2,2-Tetrachloroethane	0.5
1,2,3-Trichlorobenzene	0.5
Trichlorofluoromethane	0.5
1,2,3-Trichloropropane	0.5
1,2,4-Trimethylbenzene	1.0
1,3,5-Trimethylbenzene	0.5