INL/RPT-23-74404
Revision 0

Idaho National Laboratory Site Environmental Surveillance Program Report: Fourth Quarter 2022

October 2023

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Prepared for the
U.S. Department of Energy,
Idaho Operations Office
Under DOE Idaho Operations Office
Contract DE-AC07-05ID14517

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EXECUTIVE SUMMARY

Some human-made radionuclides were detected in samples collected during the fourth quarter of 2022. None of the radionuclides detected in samples collected during the fourth quarter of 2022 could be directly linked with INL Site activities. All detected radionuclide concentrations were well below standards set by the U.S. Department of Energy (DOE) and regulatory standards established by the U.S. Environmental Protection Agency (EPA) for protection of the public.

This report for the fourth quarter of 2022 contains results from the INL Site environmental surveillance program's monitoring of the U.S. Department of Energy's Idaho National Laboratory (INL) Site's onsite, boundary and offsite location environment, October 1 through December 31, 2022. All sample types (media) and the sampling schedule followed during 2022 are listed in Appendix A. This report contains results for the following sample types:

- Air, including particulate air filters, charcoal cartridges, and atmospheric moisture
- Quarterly composites
- Precipitation
- Drinking and surface water
- Milk
- Potatoes
- Soil
- Large game animals
- Waterfowl
- OSLDs.

Table ES-1. Summary of results for the fourth quarter of 2022.

Media	Sample Type	Analysis	Results
Air	Particulate Filters	Gross alpha, gross beta	There were no statistically significant differences for December gross alpha and gross beta concentrations. Statistically significant differences were observed for gross alpha and gross beta concentrations for the quarter, October, and November. Statistical differences were observed for gross beta concentrations between Craters of the Moon and six sampling locations. No result exceeded the Derived Concentration Standard (DCS) for gross alpha or gross beta activity in air. Results were consistent with historical data as represented by the UTL.
	Quarterly Composite	Gamma-emitting radionuclides, strontium-90, actinides (americium, plutonium, and uranium)	Americium-241 (^{241}Am) and $^{239/240}$Pu were detected in quarterly composited samples from RWMC and the duplicate in RWMC. In addition, $^{239/240}$Pu was detected in a quarterly composite from Blue Dome. Uranium-233/234 was detected in a quarterly composite from Blackfoot. Several composite samples had detections of ^{238}U which suggest a natural origin. Results were below the DOE DCS values for these radionuclides in air. Human-made gamma-emitting radionuclides (e.g., cesium-137 and strontium-90 were not detected in any of the fourth quarter composite air samples.
	Charcoal Cartridge	Iodine-131	Iodine-131 was not detected in any of the batches of charcoal cartridges counted during the quarter.
Atmospheric Moisture	Liquid	Tritium	One of seven results showed tritium concentrations greater than the 3s uncertainty during the quarter. No sample result exceeded the UTL or DCS for tritium in air.
Precipitation	Liquid	Tritium	A total of 20 samples was collected during the fourth quarter. None of the results contained tritium greater than the 3s uncertainty or exceeded the UTL. The value is within historical range and below the DCS for tritium in water.

Table ES-1. continued.

Media	Sample Type	Analysis	Results
Drinking/Surface Water	Liquid	Gross alpha, gross beta, tritium	Gross alpha activity was detected in five of nine drinking water samples and in one of the four surface water samples. Gross beta activity was detected in eight of the nine drinking water and in all four surface water samples. All concentrations were similar to previous results. Tritium was not detected in any drinking water or surface water samples. Results were similar to previous results and those in precipitation.
Milk	Liquid	Iodine-131, other gamma-emitting radionuclides, tritium, strontium-90	Forty-one milk samples were collected at seven locations (including the offsite control sample from Colorado and two duplicates). No human-made gamma-emitting radionuclides were detected. Neither ^{90}Sr nor tritium were detected in any of the samples analyzed.
Potatoes	Vegetation	Gamma-emitting radionuclides, strontium-90	No human-made gamma-emitting radionuclides nor ^{90}Sr were found in any of the nine samples (including a duplicate and a control) collected this year.
Soil	Soil	Gamma-emitting radionuclides, strontium-90, actinides (americium and plutonium)	Soil samples were collected from 30 locations on and around the INL Site. Soil data for EFS, REST, Frenchmans Cabin, and Receptor 54 is limited. No specific data are available for comparison. For the remaining locations, sitewide background value are available and results obtained in 2022 were less that the background values.
Large game animals	Tissue	Gamma-emitting radionuclides	No human-made gamma-emitting radionuclides were found in any of the tissue samples collected in fourth quarter.
Waterfowl	Tissue	Gamma-emitting radionuclides, strontium-90, actinides (americium and plutonium)	Strontium-90 was detected in a duck at levels suggesting that they were ingested from the Advanced Test Reactor Complex effluent ponds. The maximum potential dose from eating the edible tissue of a duck was estimated to be 0.0009 mrem/year.

Table ES-1. continued.

Media	Sample Type	Analysis	Results
Environmental Dosimeters	External radiation	Gamma-emitting and neutron radioactivity	Measurements of environmental radiation made using optically stimulated luminescent dosimeters (OSLDs) were primarily below the background UTL values except for Hwy22 T28; Idaho Nuclear Technology and Engineering Center (INTEC) (listed as Idaho Chemical Processing Plant or ICPP [ICPP O-27]); and the Radioactive Waste Management Facility (listed as RWMC O-13A, and RWMC O9A). Measurements that exceeded the UTL are within historical values and/or likely due to operations in those areas. Neutron dose monitoring performed at INL buildings and facilities were reported to be below the minimum measurable quantity of 10 mrem.

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FIGURES

TABLES

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ACRONYMS

ATR	Advanced Test Reactor
BEA	Battelle Energy Alliance
CFA	Central Facilities Area
DCS	Derived Concentration Standard
DOE	U.S. Department of Energy
EBR I	Experimental Breeder Reactor I
EFS	Experimental Field Station
EPA	Environmental Protection Agency
ESER	Environmental Surveillance, Education, and Research
FAA	Federal Aviation Administration
HWY	Highway
ICP	Idaho Cleanup Project
ICPP	Idaho Chemical Processing Plant
INEEL	Idaho National Engineering and Environmental Laboratory
INL	Idaho National Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center (formerly ICPP)
ISU-EAL	Idaho State University-Environmental Assessment Laboratory
MAPEP	Mixed Analyte Performance Evaluation Program
MDC	minimum detectable concentration
MFC	Materials and Fuel Complex
NRF	Naval Reactors Facility
NRTS	National Reactor Testing Station
OSLD	optically stimulated luminescent dosimeters
RESL	Radiological and Environmental Sciences Laboratory
RHLLW	Remote-handled Low-Level Waste
RWMC	Radioactive Waste Management Complex
SMC	Specific Manufacturing Capability
UTL	upper tolerance limit

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UNITS

Bq	becquerel
Ci	curie
g	gram
L	liter
µCi	microcurie
ml	milliliter
mrem	millirem
mR	milliroentgen
pCi	picocurie

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1. INL Contractor Program Description

Operations at the Idaho National Laboratory (INL) Site are conducted under requirements imposed by the U.S. Department of Energy (DOE) under authority of the Atomic Energy Act and the U.S. Environmental Protection Agency (EPA) under several acts (e.g., the Clean Air Act and Safe Drinking Water Act). The requirements imposed by DOE are specified in DOE Orders. These requirements include those to monitor the effects of DOE activities both inside and outside the boundaries of DOE facilities (DOE 2011, DOE 2015a).

During calendar year 2022, environmental surveillance within the INL Site boundaries was primarily the responsibility of the INL and Idaho Cleanup Project (ICP) contractors. The INL contractor also provides surveillance off the INL Site.

In December 2020, DOE initiated transition of the Environmental Surveillance, Education, and Research (ESER) Program from DOE management to the INL contract managed by Battelle Energy Alliance, LLC (BEA). A team composed of DOE, BEA and the ESER Program contractor, Veolia Nuclear Solutions – Federal Services, successfully transitioned the program on September 30, 2021. It is now called the Environmental Monitoring and Natural Resource Services. The ESER Program environmental surveillance scope has been integrated into the INL environmental surveillance program. Sampling activities conducted prior to September 30, 2021, were performed by Veolia Nuclear Solutions – Federal Services while sampling activities conducted after September 30, 2021, were performed under BEA.

This report contains integrated surveillance monitoring results from the INL contractor for samples collected during the fourth quarter of 2022 (October 1 – December 31, 2022).

The INL environmental surveillance program is designed to satisfy the following objectives:

- verify compliance with applicable environmental laws, regulations, and DOE Orders
- characterize and define trends in the physical, chemical, and biological condition of environmental media on and around the INL Site
- assess the potential radiation dose to members of the public from INL Site effluents
- present laboratory data which has been reviewed using an EPA quality assurance process.

The goal of the surveillance program is to monitor different media at a number of potential exposure points within the various exposure pathways, including air, water, agricultural products, wildlife, and soil that could possibly contribute to the radiation dose received by the public.

Environmental samples collected include:

- air at 38 low-volume air samplers (four of which are used as replicate samplers) at 34 locations on and around the INL Site
- atmospheric moisture at two INL Site locations and at four locations off the INL Site
- precipitation collected at one INL Site location and three locations off the INL Site
- drinking water collected from eight locations off the INL Site
- surface water collected from three springs located downgradient of the INL Site and from five locations along the Big Lost River, when it is flowing, on the INL Site
- agricultural products, including milk at six dairies around the INL Site, potatoes from at least eight regional producers, alfalfa from three locations off the INL Site, grain (wheat and barley) from approximately nine regional producers, and lettuce from approximately seven home-owned and portable gardens on and around the INL Site

- soil from 30 locations on and around the INL Site biennially
- environmental dosimeters from 196 locations semi-annually
- various numbers of wildlife including bats, big game (pronghorn, mule deer, and elk) and waterfowl sampled from the INL Site.

Table A-1 in Appendix A lists samples, sampling locations, and collection frequency for the INL contractor.

Three laboratories were used to perform analyses on routine environmental samples collected during the quarter identified in this report. ALS was not used for sample analysis due to closure of the lab in August 2022. The INL Environmental Services In Situ Gamma Laboratory was used to scan charcoal cartridges for gamma-emitting radionuclides. The Idaho State University Environmental Assessment Laboratory performed routine gross alpha, gross beta, tritium, and gamma spectrometry analyses. GEL Laboratories performed routine gross alpha, gross beta, and gamma spectrometry analyses. Analyses requiring radiochemistry including strontium-90 (^{90}Sr), plutonium-238 (^{238}Pu), plutonium-239/240 ($^{239/240}$Pu), uranium-233/234 ($^{233/234}$U), uranium-235 (^{235}U), uranium-238 (^{238}U) and ^{241}Am were also performed by GEL Laboratories.

In the event of non-routine occurrences, such as suspected releases of radioactive material, the INL contractor may increase the frequency of sampling and/or the number of sampling locations based on the nature of the release and wind distribution patterns. Any data found to be outside historical norms is thoroughly investigated to determine if an INL Site origin is likely. Investigation may include re-sampling and/or re-analysis of prior samples.

In the event of any suspected worldwide nuclear incidents, like the 1986 Chernobyl accident or the 2011 Fukushima accident, the EPA may request additional sampling be performed through RadNet. RadNet is a nationwide environmental radiation monitoring system that monitors the nation's air, precipitation, and drinking water for radiation. The INL contractor currently operates a high-volume air sampler and collects precipitation and drinking water in Idaho Falls for this national program and routinely sends samples to EPA's Eastern Environmental Radiation Facility for analyses. The RadNet data collected at Idaho Falls are not reported by the INL contractor but are available through the EPA RadNet website (https://www.epa.gov/radnet).

Once samples have been collected and analyzed, the INL contractor has the responsibility for quality control of the data, entry into databases, and reporting in quarterly reports. The quarterly reports are then consolidated into the INL Site Environmental Report for each calendar year. The annual report also includes data collected by other INL Site contractors.

The results reported in the quarterly and annual reports are assessed in terms of data quality and statistical significance with respect to laboratory analytical uncertainties, sample locations, reported INL Site releases, meteorological data, and worldwide events that might conceivably affect the INL Site environment. First, field collection and laboratory information are reviewed to determine identifiable errors that would invalidate or limit use of the data. Examples of such limitations include insufficient sample volume, torn filters, evidence of laboratory cross-contamination or quality control issues. Data that pass initial screening are further evaluated using statistical methods. Statistical tools are necessary for data evaluation particularly since environmental measurements typically involve the determination of minute concentrations, which are difficult to detect and even more difficult to distinguish from other measurements.

Results are presented in this report with an analytical uncertainty term, s, where 's' is the estimated sample standard deviation (σ), assuming a Gaussian or normal distribution. All results are reported in this document, even those that do not necessarily represent detections. The term 'detected,' as used for the discussion of results in this report, does not imply any degree of risk to the public or environment, but

rather indicates that the radionuclide was measured at a concentration sufficient for the analytical instrument to record a value that is statistically different from background. Laboratory measurements involve the analysis of a target sample and the analysis of a prepared laboratory blank (i.e., a sample which is identical to the sample collected in the environment, except that the radionuclide of interest is absent). In order to conclude that a radionuclide has been detected, it is essential to consider two fundamental aspects of the problem of detection: (1) the instrument signal for the sample must be greater than that observed for the blank before the decision can be made that the radionuclide has been detected; and (2) an estimate must be made of the minimum radionuclide concentration that will yield a sufficiently large observed signal before the correct decision can be made for detection or non-detection. Each laboratory currently defines a detection of radioactivity in an individual sample if the result exceeds a detection level calculated by the laboratory after the analysis of a background sample, based on calculations derived by Currie (1984). The minimum detectable concentration (MDC) is defined as the concentration at which there is a 95% confidence that an analyte signal will be distinguishable from an analyte-free sample.

In addition, the INL contractor uses three standard deviation criterion to minimize the chance that a potentially false positive result is included in the data set. A false positive result is indicated when the range encompassing the result, plus or minus the total uncertainty at three standard deviations, includes zero (e.g., 2.5 +/- 1.0; range of -0.5 to 5.5). Statistically, the probability that a result can exceed the absolute value of its total uncertainty at three standard deviations by chance alone is less than 1%. A result that is greater than three times the total uncertainty of the measurement represents a statistically positive detection with over 99% confidence (DOE 2015b). The INL contractor reports measured radionuclide concentrations greater than or equal to their respective 3s uncertainties as being detected with confidence.

Concentrations between 2s and 3s are reported as questionably detected. That is, the radionuclide may be present in the sample; however, the probability that a result can exceed the absolute value of its total uncertainty at two standard deviations by chance alone may be as high as 5%. Measurements made between 2s and 3s are examined further to determine if they are a part of a pattern (temporal or spatial) that might warrant further investigation or recounting. For example, if a radionuclide is routinely detected at > 3s at a specific location, a sample result between 2s and 3s might be considered detected.

If a result is less than or equal to 2s there is even less statistical confidence that the radionuclide is present in the sample. Analytical results in this report are presented as the result value ± one standard deviation (1s) for reporting consistency with the annual report. To obtain the 2s or 3s values simply multiply the uncertainty term by 2 or 3.

Data are also compared to historical measurements using the upper tolerance limit (UTL). The UTL is a value such that 99% of the population (in this case, all valid measurements made between 2011-2020) is less than the UTL with 95% confidence (EPA 2015). With a 99%/95% UTL it is expected that approximately 1% of the measurements will exceed the UTL if the concentration of a radionuclide is within the normal range. This means that if a concentration exceeds the UTL it does not necessarily indicate that the site is outside of the normal range. Rather, it indicates that the measurement should be closely examined to determine if it is unusually high.

For more information concerning the INL environmental surveillance program, please email scott.lee@inl.gov, or visit https://idahoeser.inl.gov/.

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2. INL Site

The INL Site is a nuclear energy and homeland security research and environmental management facility. It is owned and administered by the DOE, Idaho Operations Office and occupies about 890 mi^2 (2,300 km^2) of the upper Snake River Plain in Southeastern Idaho (Figure 1). The history of the INL Site began during World War II when the U.S. Naval Ordnance Station was located in Pocatello, Idaho. This station, one of two such installations in the U.S., retooled large guns from U.S. Navy warships. The retooled guns were tested on the nearby, uninhabited plain, known as the Naval Proving Ground. In the years following the war, as the nation worked to develop nuclear power, the Atomic Energy Commission, predecessor to the DOE, became interested in the Naval Proving Ground and made plans for a facility to build, test, and perfect nuclear power reactors.

The Naval Proving Ground became the National Reactor Testing Station (NRTS) in 1949, under the Atomic Energy Commission. By the end of 1951, a reactor at the NRTS became the first to produce useful amounts of electricity. Over time the site has operated 52 various types of reactors, associated research centers, and waste handling areas. The NRTS was renamed the Idaho National Engineering Laboratory in 1974, and the Idaho National Engineering and Environmental Laboratory (INEEL) in January 1997. With renewed interest in nuclear power the DOE announced in 2003 that Argonne National Laboratory and the INEEL would be the lead laboratories for development of the next generation of power reactors. On February 1, 2005, the INEEL and Argonne National Laboratory-West became the INL. The INL is committed to providing international nuclear leadership for the 21st Century, developing and demonstrating compelling national security technologies, and delivering excellence in science and technology as one of the DOE's multi-program national laboratories. Battelle Energy Alliance, LLC, is responsible for the management and operations of the INL.

The ICP Core is a separately managed effort. The ICP Core is charged with safely and cost-effectively completing the majority of cleanup work from past laboratory missions in an ongoing process. The Idaho Environmental Coalition, LLC, is responsible for the ICP Core.

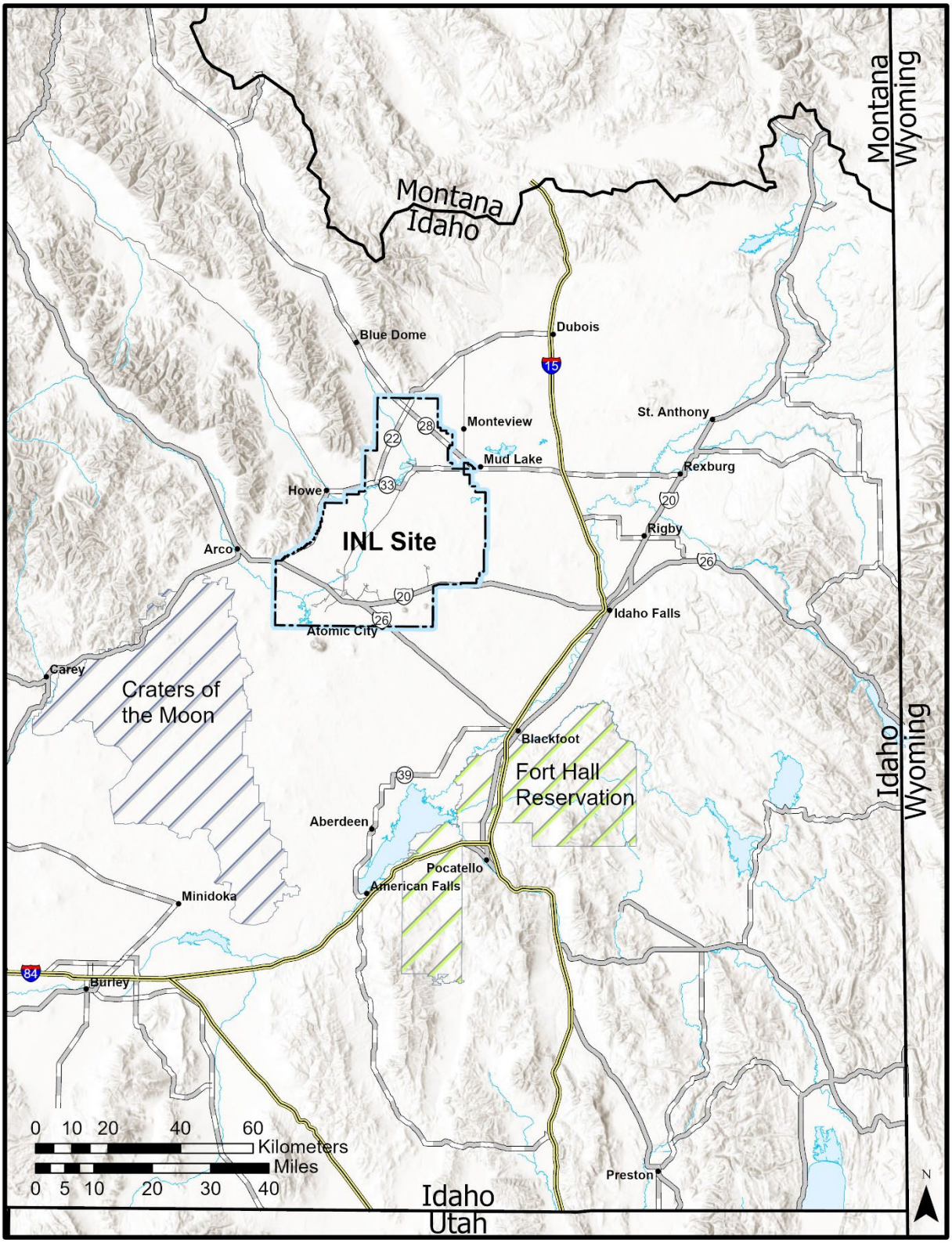

Figure 1. Location of the INL Site.

3. Air Sampling

The primary pathway by which radionuclides can move off the INL Site is through the air and for this reason the air pathway is the primary focus of monitoring on and around the INL Site. Samples for particulates and iodine-131 (^{131}I) gas in air were collected weekly for the duration of the quarter at 34 locations using low-volume air samplers. Moisture in the atmosphere was sampled at sis locations around the INL Site and analyzed for tritium. Air sampling activities and results for the fourth quarter of 2022 are discussed below. A summary of approximate MDCs for radiological analyses and DOE Derived Concentration Standard (DCS) (DOE 2021) values is provided in Appendix B.

3.1 Low-volume Air Sampling

Radioactivity associated with airborne particulates was monitored continuously by 38 low-volume air samplers (four of which are used as replicate samplers) at 34 locations during the fourth quarter of 2022 (Figure 2). Nineteen of these samplers are located onsite, seven are situated off the INL Site near the boundary, and eight have been placed at locations off the INL Site. Samplers are divided into onsite, boundary, and offsite groups to determine if there is a gradient of radionuclide concentrations, increasing towards the INL Site. Each replicate sampler is relocated every other year to a new location. During the fourth quarter 2022, replicate samplers were located at Dubois (offsite location), Idaho Nuclear Technology and Engineering Center (INTEC) – west side (onsite location), Radioactive Waste Management Complex (RWMC) (onsite location), and Van Buren (onsite location). Particulates in air were collected on membrane particulate filters (1.2 μm pore size), whereas, gases passing through the filter were collected with an activated charcoal cartridge.

Filters and charcoal cartridges were changed weekly at each station during the quarter. Each particulate filter was analyzed for gross alpha and gross beta radioactivity using thin-window gas flow proportional counting systems after waiting about four days for shorter-lived naturally-occurring daughter products of radon and thorium to decay.

The weekly particulate filters collected during the quarter for each location were composited and analyzed for gamma-emitting radionuclides. Composites were also analyzed for ^{90}Sr, ^{238}Pu, $^{239/240}Pu$, $^{233/234}U$, ^{235}U, ^{238}U, and ^{241}Am.

Charcoal cartridges were analyzed for gamma-emitting radionuclides, specifically for ^{131}I, using two methods. Cartridges analyzed by Idaho State University Environmental Assessment Laboratory are done in batches of ten as an initial scan. If the scan results in ^{131}I activity above 3-sigma, the cartridges are split into smaller batches and analyzed to identify the cartridge which contains the radioanalyte above 3-sigma. Cartridges which are analyzed by the INL Environmental Services In Situ Gamma Laboratory are scanned individually. If the scan of an individual cartridge results in a positive detection, the cartridge is shipped to GEL Laboratories for analysis. Iodine-131 is of particular interest because it is produced in relatively large quantities by nuclear fission, is readily accumulated in human and animal thyroids, and has a half-life of eight days. This means that any elevated level of ^{131}I in the environment could be from a recent release of fission products.

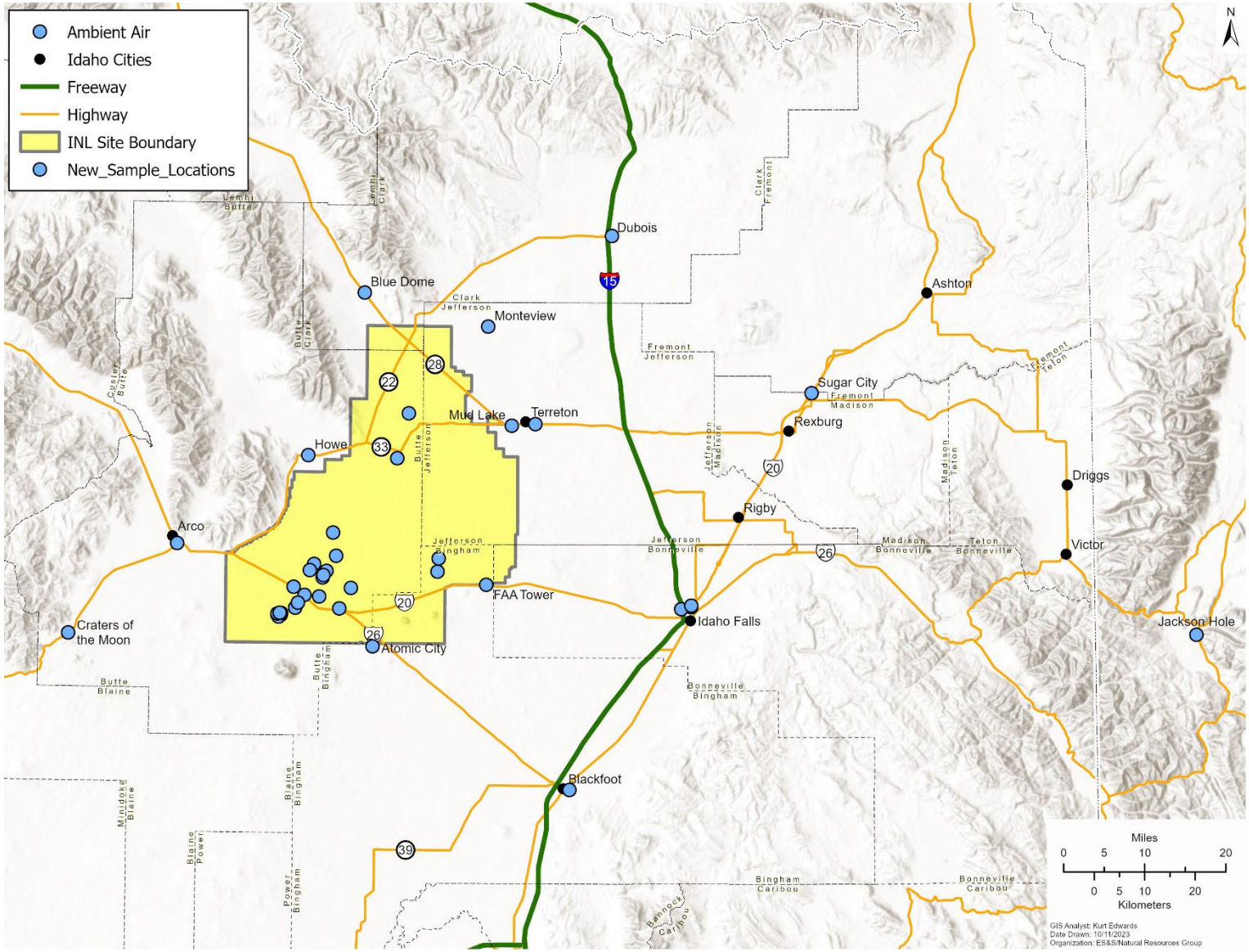

Figure 2. INL contractor air monitoring locations.

Gross alpha results are reported in Table C-1 and shown in Figures 3 through 6. Gross alpha concentrations measured in individual samples ranged from a low of $(-0.4 \pm 1.7) \times 10^{-16}$ µCi/ml collected at Sugar City on November 9, 2022, to a high of $(9.7 \pm 1.1) \times 10^{-15}$ µCi/ml collected at Main Gate on November 22, 2022. All results were less than the DCS of 1.1×10^{-13} µCi/ml for $^{239/240}$Pu (see Table B-1 of Appendix B). In addition, the results were consistent with historical data, as represented by the 99%/95% UTL for gross alpha activity (4.8×10^{-15} µCi/ml). The UTL was determined using ten years of historical data (measured from 2011 through 2020) and the ProUCL statistical software (https://www.epa.gov/land-research/proucl-software). The 99%/95% UTL is a value such that 99% of the population (all possible air measurements) is less than the UTL with 95% confidence. With a 99%/95% UTL it is expected that approximately 1% of the measurements will exceed the UTL if the concentration of gross alpha is within the normal range. This means that if a concentration exceeds the UTL it does not necessarily indicate that the result is outside of the normal range. Rather, it indicates that the measurement should be closely examined to determine if it is unusually high.

Gross alpha data have been tested for distribution (normally or lognormally distributed) and generally show no consistent discernible distribution. Because there is no discernible distribution of the data, a parametric test of significance cannot be used. The nonparametric Kruskal-Wallis analysis of variance by ranks test of multiple independent groups was used to determine statistical differences between onsite, boundary, and offsite locations. The test assesses the hypothesis that the different samples in the comparison were drawn from the same distribution or from distributions with the same median. In the computation of the Kruskal-Wallis test, each of the N observations is replaced by a rank. That is, all the results from all the locations are combined and ranked in a single series with the smallest result replaced by rank 1 and the largest result replaced by rank N (i.e., the total number of results). The sum of the ranks in each location group (i.e., onsite, boundary, and offsite) is found and then averaged for each group. If the samples are from the same populations, the average ranks should be about the same, whereas if the samples are from populations with different medians, the average ranks should differ. Statistically significant difference exists between data groups if the p-value (or probability value) is less than 0.05. Values greater than 0.05 translate into a 95% confidence that the medians are statistically the same. The p-value for each comparison is shown in Table D-1. There was no statistically significant difference among groups for December, however, there were statistically significant difference among groups for the quarter and the months of October and November (Table D-1). To determine if there were any differences between stations and where the differences occur, the Kruskal-Wallis analysis of variance by ranks test was used again. No differences were determined (Table D-2).

Trends in the data appear to be seasonal in nature and do not demonstrate any INL Site influence. This indicates that INL Site airborne effluents were not measurable in environmental air samples.

Gross beta results are presented in Table C-1 and displayed in Figures 7 through 10. Gross beta concentrations measured in individual samples ranged from a low of $(5.6 \pm 0.5) \times 10^{-15}$ µCi/ml collected at Craters of the Moon on November 9, 2022, to a high of $(11.4 \pm 0.20) \times 10^{-14}$ µCi/ml collected at Main Gate on November 22, 2022. The typical temporal fluctuations in gross beta concentrations in air were observed during the quarter. All results were less than the DCS of 9.6×10^{-12} µCi/ml for ^{90}Sr (see Table B-1 of Appendix B). In addition, the results were consistent with historical data, as represented by the 99%/95% UTL for gross beta activity (6.3×10^{-14} µCi/ml). The data were tested quarterly and generally are found to be neither normally nor log-normally distributed. Box and whiskers plots were used to present the non-parametric data. Outliers and extreme values were retained in subsequent statistical analyses because they are within the range of measurements made in the past ten years, and because these values could not be attributed to mistakes in collection, analysis, or reporting procedures.

There were no statistically significant differences in the gross beta data between groups for December, yet data measured during the quarter, October, and November had statistically significant differences (Table D-1). To determine if there were any differences between stations and where the differences occur,

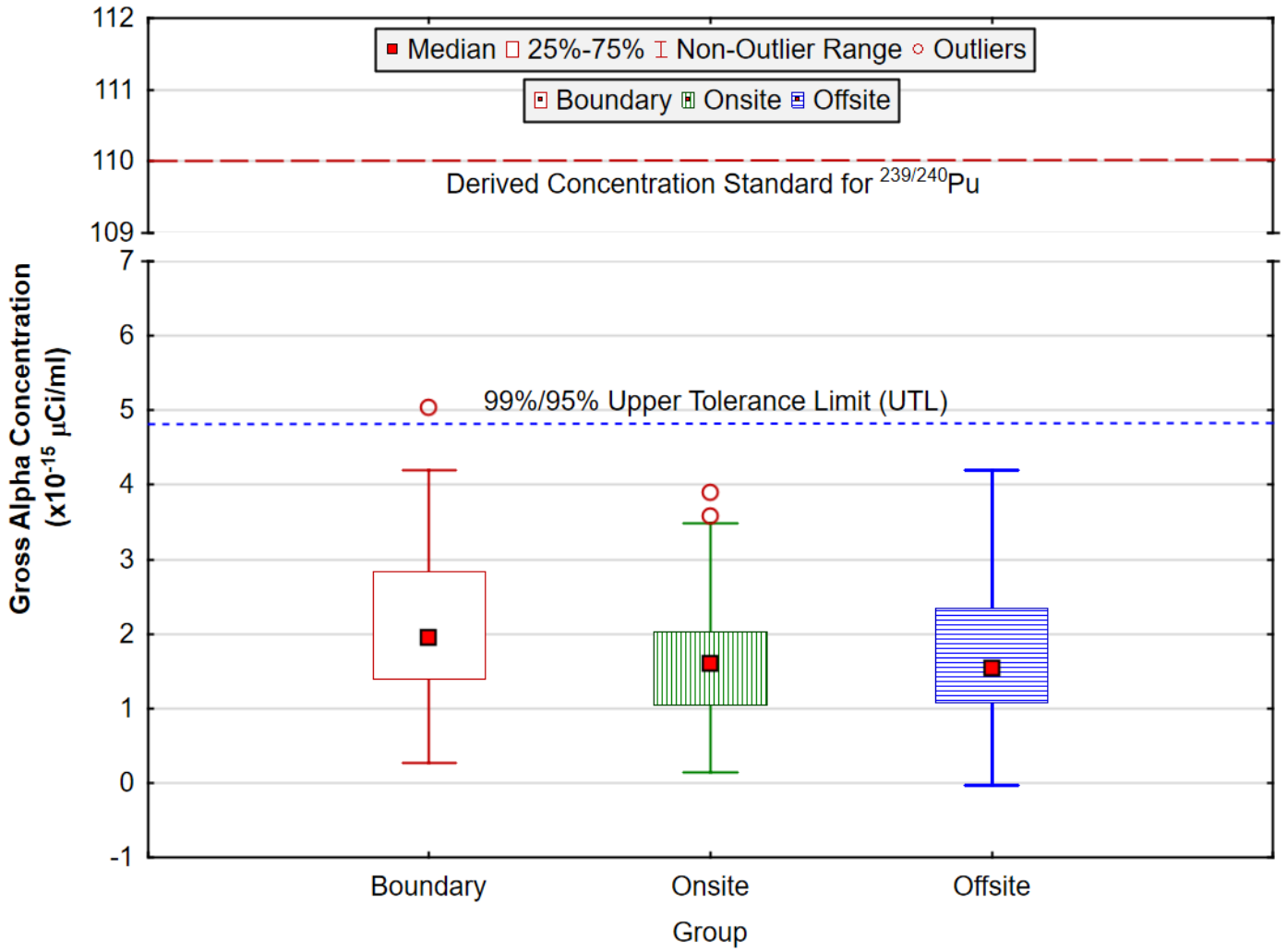

Figure 3. Gross alpha concentrations in air at onsite, boundary, and offsite locations for the fourth quarter of 2022. The DCS is the concentration of $^{239/240}Pu$ in air which, if inhaled for a year, would result in a dose of 100 mrem/yr. Because the measurements include naturally occurring radionuclides (such as ^{238}U, ^{234}U, ^{232}Th, ^{226}Ra, and ^{210}Po) in uncertain proportions, a meaningful DCS cannot be constructed for gross alpha concentrations. The DCS for $^{239/240}Pu$ is shown because it is the most restrictive human-made alpha emitter. The UTL represents the value below which 99% of the population values are expected to fall with 95% confidence.

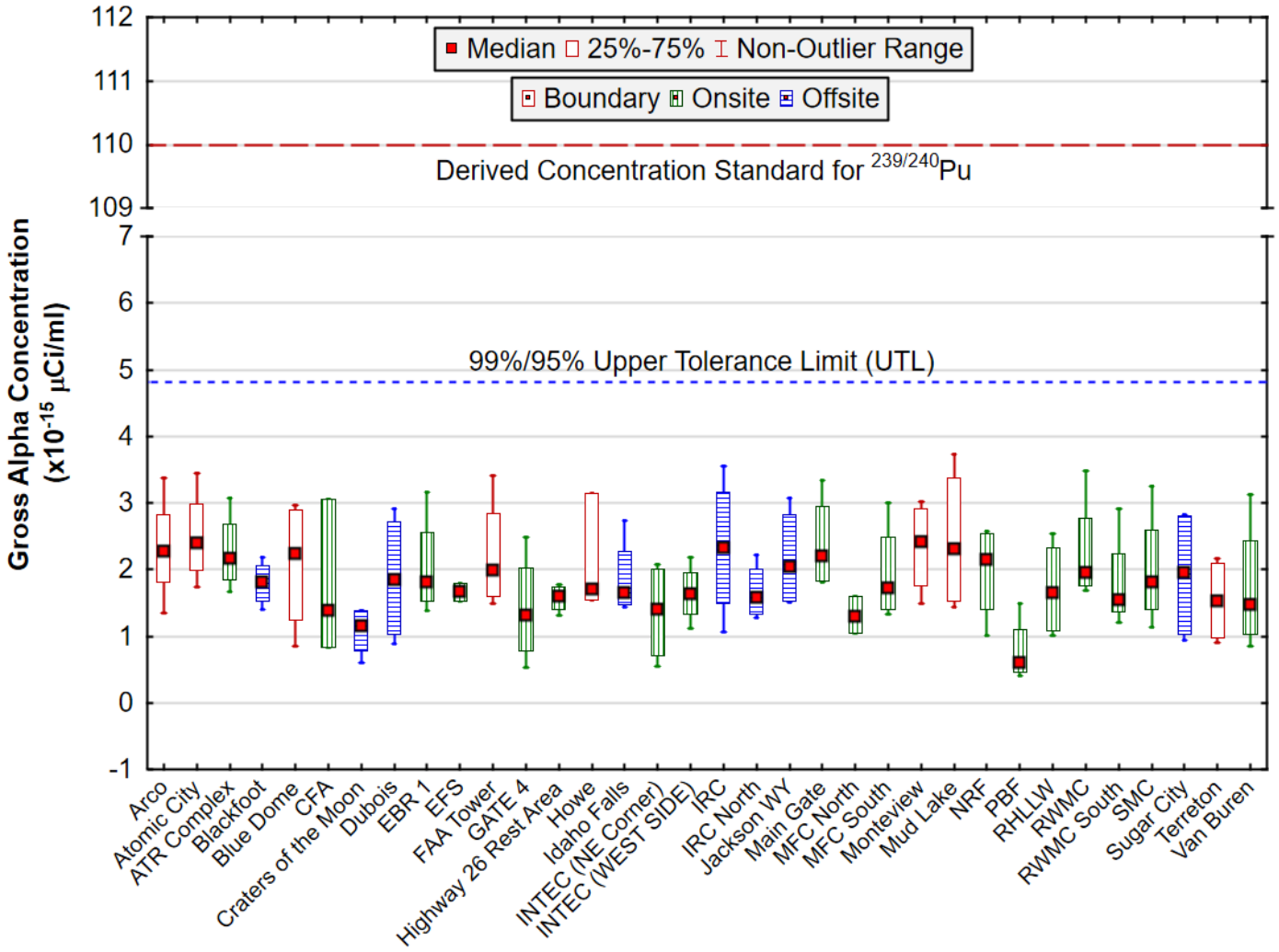

Figure 4. October 2022 gross alpha concentrations in air at onsite, boundary, and offsite locations. The DCS is the concentration of $^{239/240}Pu$ in air which, if inhaled for a year, would result in a dose of 100 mrem/yr. Because the measurements include naturally occurring radionuclides (such as ^{238}U, ^{234}U, ^{232}Th, ^{226}Ra, and ^{210}Po) in uncertain proportions, a meaningful DCS cannot be constructed for gross alpha concentrations. The DCS for $^{239/240}Pu$ is shown because it is the most restrictive human-made alpha emitter. The UTL represents the value below which 99% of the population values are expected to fall with 95% confidence.

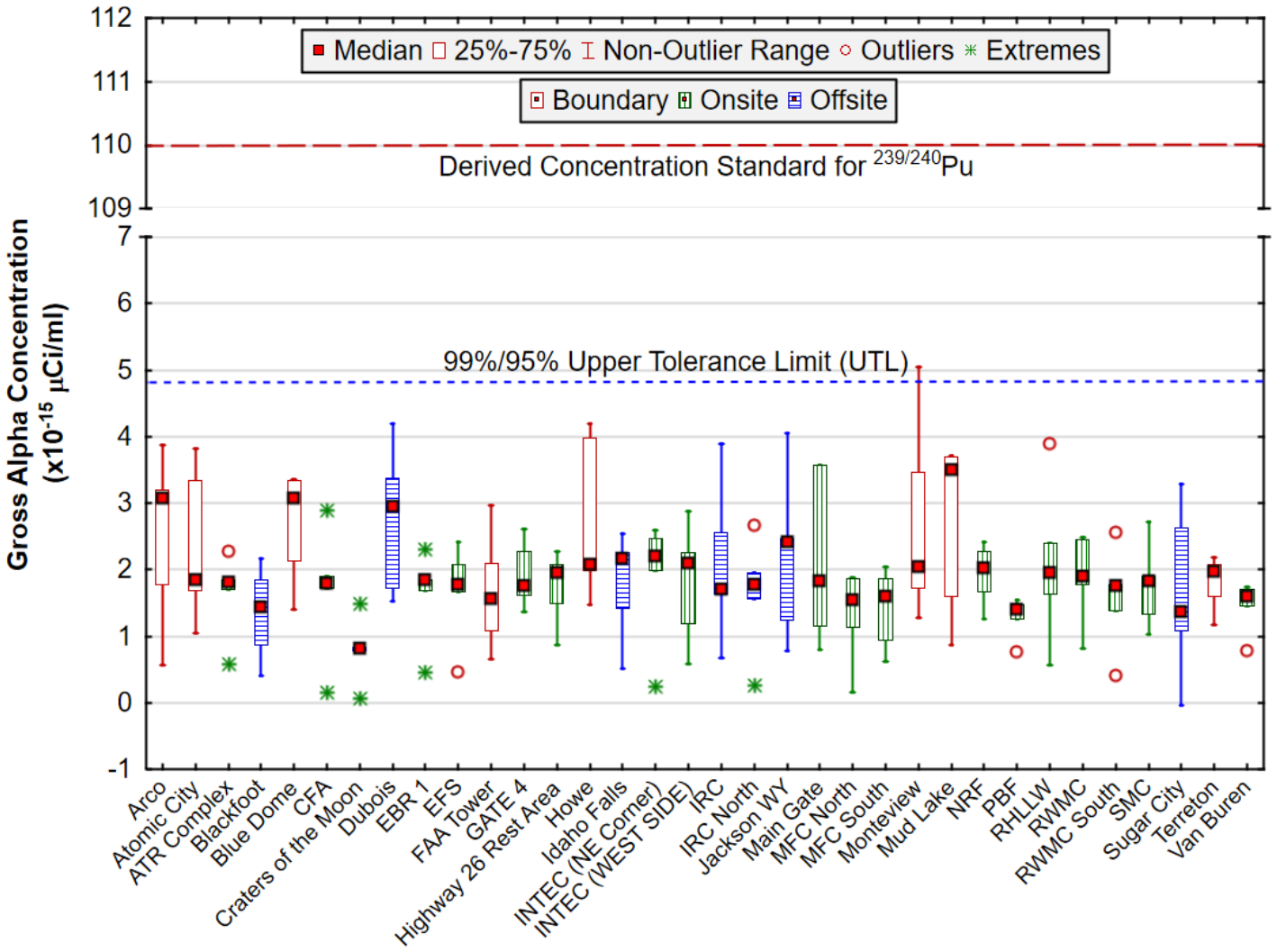

Figure 5. November 2022 gross alpha concentrations in air at onsite, boundary, and offsite locations. The DCS is the concentration of $^{239/240}Pu$ in air which, if inhaled for a year, would result in a dose of 100 mrem/yr. Because the measurements include naturally occurring radionuclides (such as ^{238}U, ^{234}U, ^{232}Th, ^{226}Ra, and ^{210}Po) in uncertain proportions, a meaningful DCS cannot be constructed for gross alpha concentrations. The DCS for $^{239/240}Pu$ is shown because it is the most restrictive human-made alpha emitter. The UTL represents the value below which 99% of the population values are expected to fall with 95% confidence.

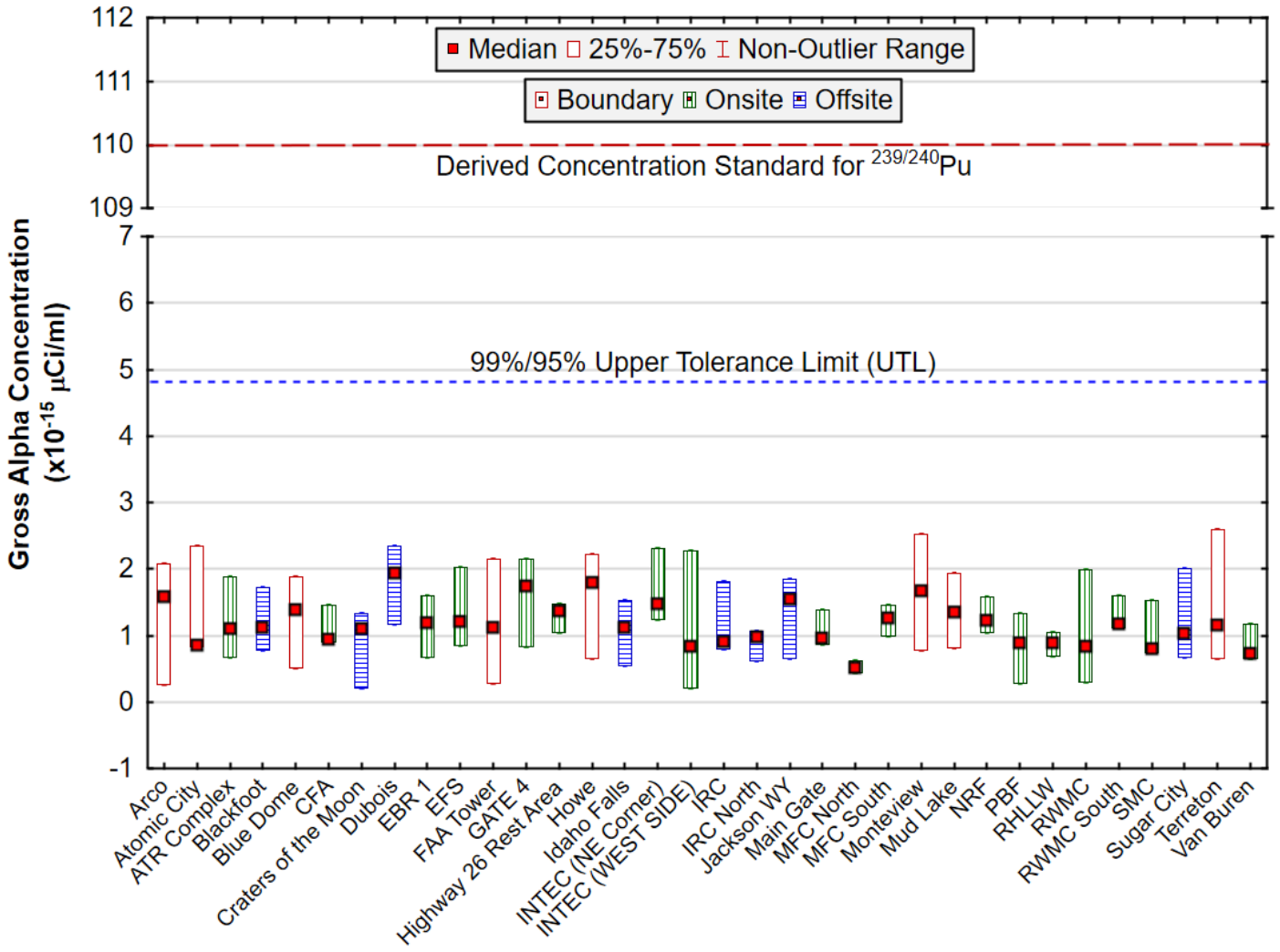

Figure 6. December 2022 gross alpha concentrations in air at onsite, boundary, and offsite locations. The DCS is the concentration of $^{239/240}Pu$ in air which, if inhaled for a year, would result in a dose of 100 mrem/yr. Because the measurements include naturally occurring radionuclides (such as ^{238}U, ^{234}U, ^{232}Th, ^{226}Ra, and ^{210}Po) in uncertain proportions, a meaningful DCS cannot be constructed for gross alpha concentrations. The DCS for $^{239/240}Pu$ is shown because it is the most restrictive human-made alpha emitter. The UTL represents the value below which 99% of the population values are expected to fall with 95% confidence.

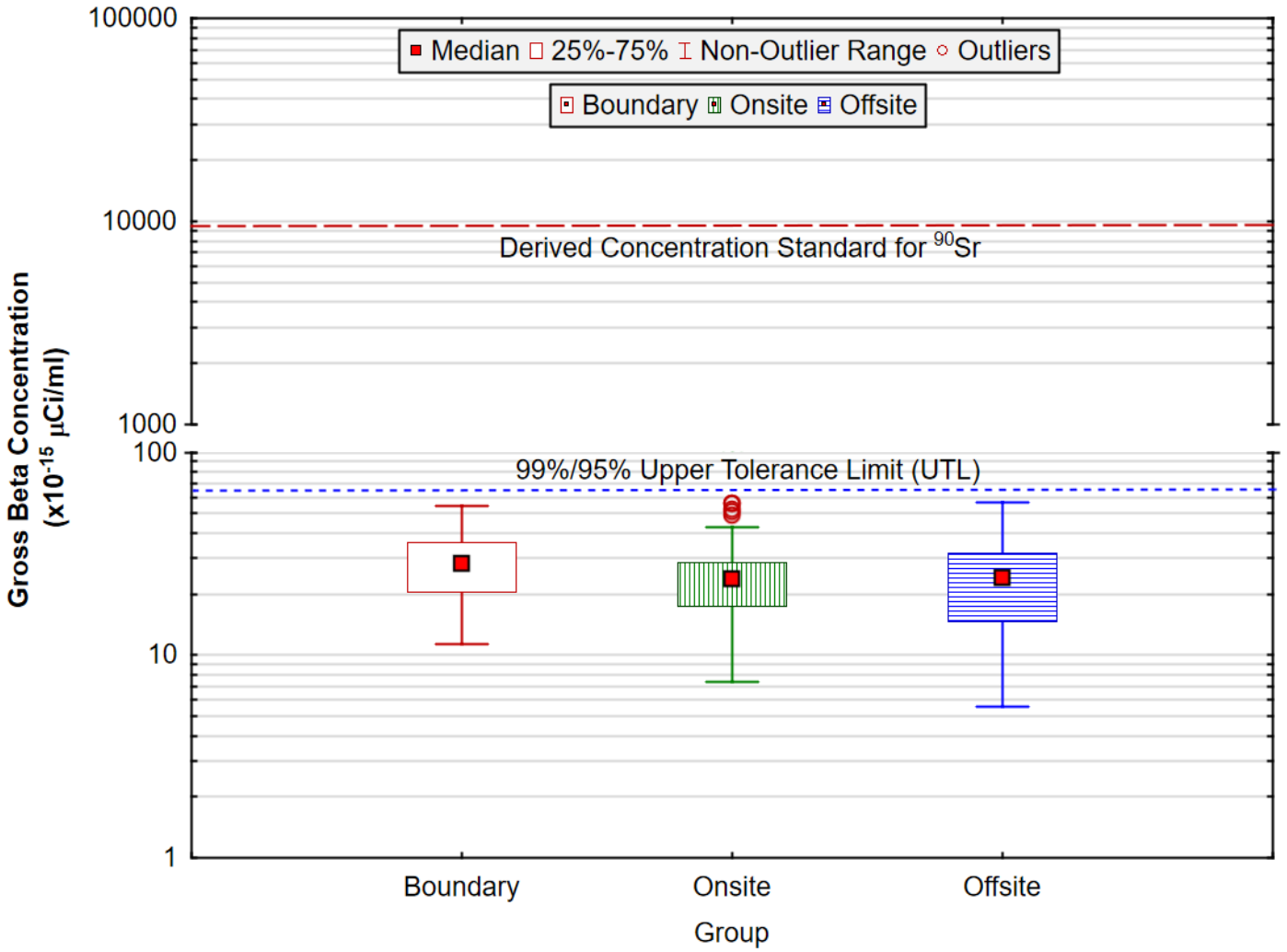

Figure 7. Gross beta concentrations in air at onsite, boundary, and offsite locations for the fourth quarter of 2022. The DCS is the concentration of ^{90}Sr in air which, if inhaled for a year, would result in a dose of 100 mrem/yr. Because the measurements include naturally occurring radionuclides (such as ^{40}K, ^{228}Ra, and ^{210}Pb) in uncertain proportions, a meaningful DCS cannot be constructed for gross beta concentration. The DCS for ^{90}Sr is shown because it is the most restrictive human-made beta emitter. The UTL represents the value below which 99% of the population values are expected to fall with 95% confidence.

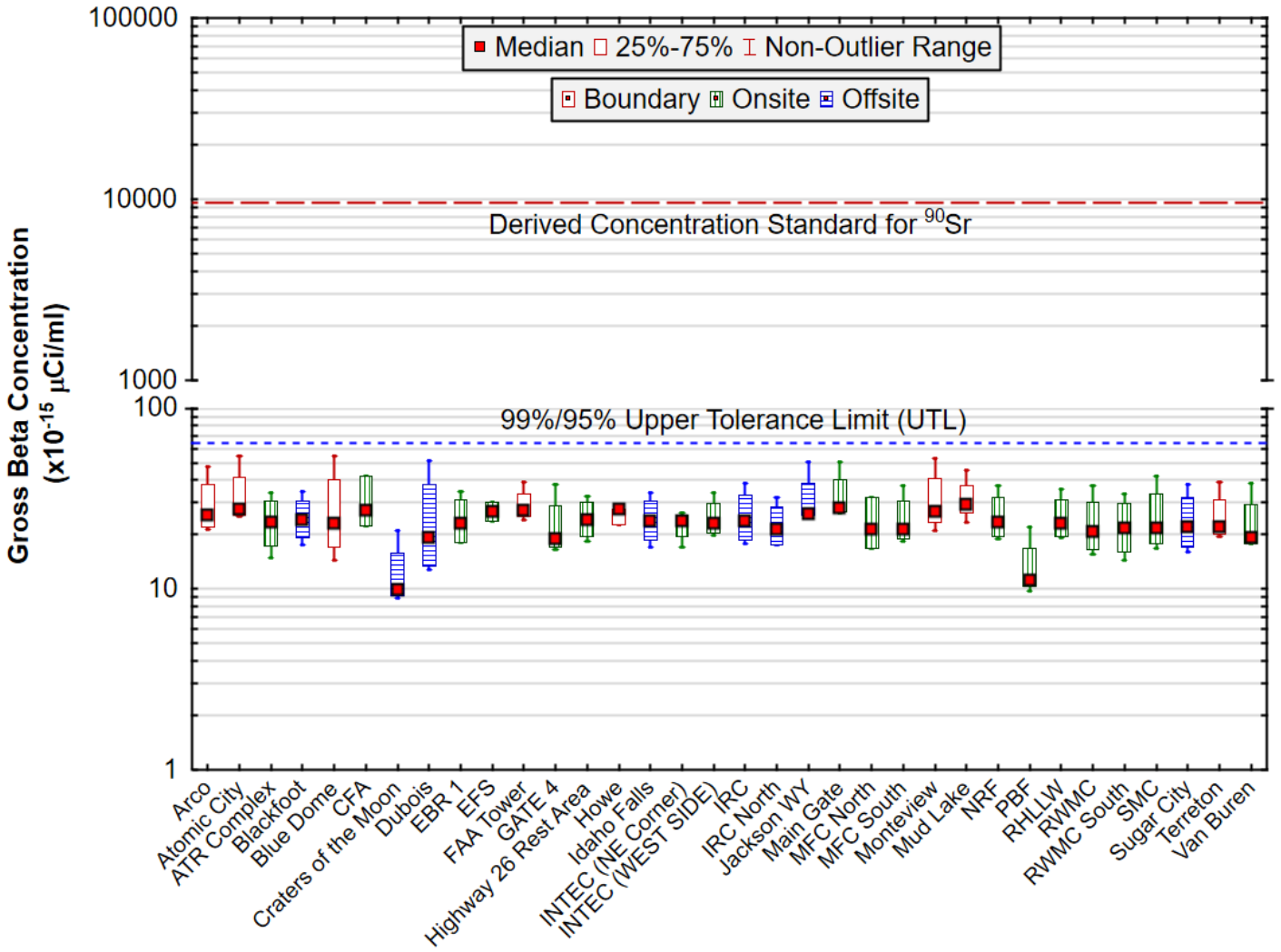

Figure 8. October 2022 gross beta concentrations in air at onsite, boundary, and offsite locations. The DCS is the concentration of ^{90}Sr in air which, if inhaled for a year, would result in a dose of 100 mrem/yr. Because the measurements include naturally occurring radionuclides (such as ^{40}K, ^{228}Ra, and ^{210}Pb) in uncertain proportions, a meaningful DCS cannot be constructed for gross beta concentrations. The DCS for ^{90}Sr is shown because it is the most restrictive human-made beta emitter. The UTL represents the value below which 99% of the population values are expected to fall with 95% confidence.

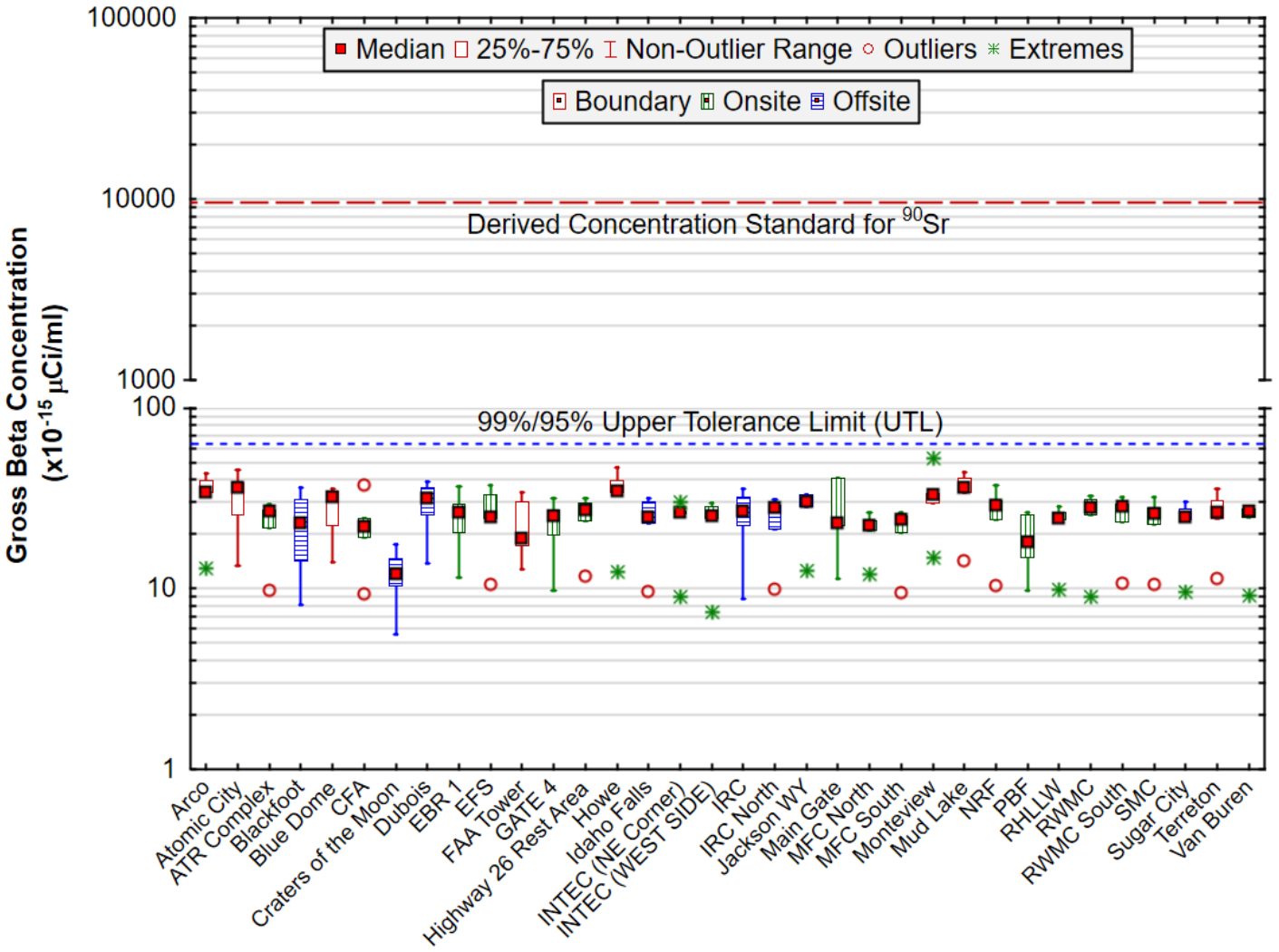

Figure 9. November 2022 gross beta concentrations in air at onsite, boundary, and offsite locations. The DCS is the concentration of ^{90}Sr in air which, if inhaled for a year, would result in a dose of 100 mrem/yr. Because the measurements include naturally occurring radionuclides (such as ^{40}K, ^{228}Ra, and ^{210}Pb) in uncertain proportions, a meaningful DCS cannot be constructed for gross beta concentrations. The DCS for ^{90}Sr is shown because it is the most restrictive human-made beta emitter. The UTL represents the value below which 99% of the population values are expected to fall with 95% confidence.

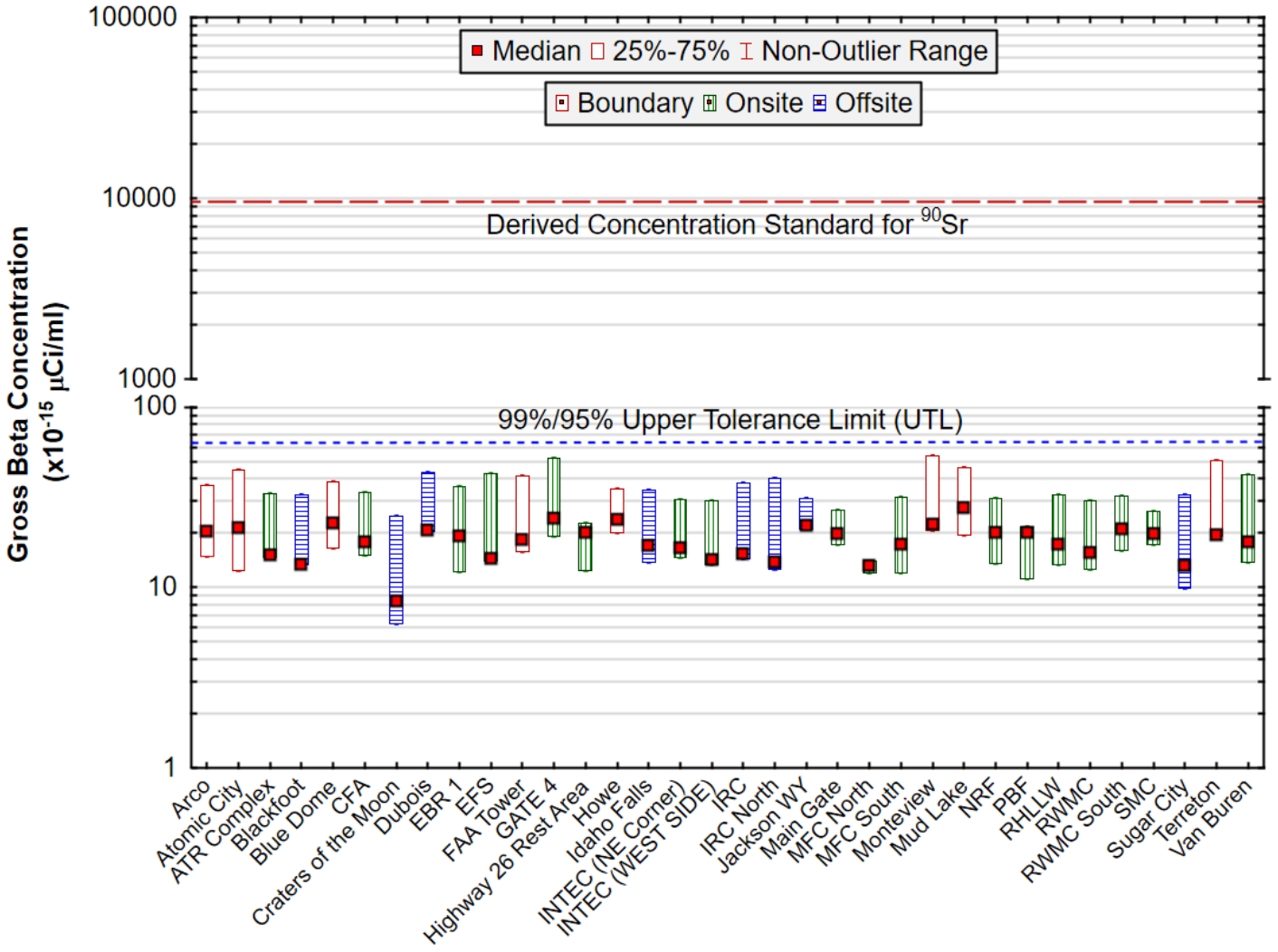

Figure 10. December 2022 gross beta concentrations in air at onsite, boundary, and offsite locations. The DCS is the concentration of ^{90}Sr in air which, if inhaled for a year, would result in a dose of 100 mrem/yr. Because the measurements include naturally occurring radionuclides (such as ^{40}K, ^{228}Ra, and ^{210}Pb) in uncertain proportions, a meaningful DCS cannot be constructed for gross beta concentrations. The DCS for ^{90}Sr is shown because it is the most restrictive human-made beta emitter. The UTL represents the value below which 99% of the population are expected to fall with 95% confidence.

multiple comparisons were also made using the Kruskal-Wallis analysis of variance by ranks test between gross beta concentrations measured at all locations. Statistical differences were determined for Craters of the Moon when compared to Arco, Atomic City, Howe, Jackson WY, Monteview, and Mud Lake (Table D-3).

Iodine-131 was not detected in any of the charcoal cartridges measured during the fourth quarter. Weekly ^{131}I results for each location are listed in Table C-2.

No ^{137}Cs or other human-made gamma-emitting radionuclides were found in quarterly air composites. Strontium-90, a beta-emitting radionuclide associated with historic nuclear weapons testing fallout, was not detected in any composite samples (Table C-3). The DCS for ^{90}Sr in air is 2.5E-11 μCi/ml (see Table B-1 of Appendix B).

Americium-241, $^{239/240}Pu$, $^{233/234}U$ and ^{238}U, alpha-emitting radionuclides, were detected in composite samples collected in the third quarter of 2022. Composite samples at RWMC and RWMC (QA) resulted in ^{241}Am and $^{239/240}Pu$ (See Table C-3). In addition, $^{239/240}Pu$ was detected at Blue Dome. Uranium-233/234 was detected in a composite sample from Blackfoot. Several composite samples had detections of ^{238}U, likely originating from natural sources. All results were below the DOE DCS values for these radionuclides in air (i.e., 1.1×10^{-13} μCi/mL for $^{239/240}Pu$, 1.3×10^{-13} μCi/mL for ^{241}Am, 1.6×10^{-13} μCi/mL for $^{233/234}U$ and 1.8×10^{-13} μCi/mL for ^{238}U).

3.2 Atmospheric Moisture Sampling

Atmospheric moisture is collected by pulling air through a column of absorbent material (molecular sieve material) to absorb water vapor. The water is then extracted from the absorbent material by heat distillation. The resulting water samples are then analyzed for tritium using liquid scintillation.

Results were available for seven atmospheric moisture samples collected at the onsite, boundary, and offsite locations during the fourth quarter of 2022 (Figure 11). One of the results exceeded the 3s uncertainty level for tritium, with a reported value of $(1.47 \pm 0.47) \times 10^{-13}$ μCi/mL$_{air}$ at Idaho Falls. The maximum result is below the 99%/95% UTL of 1.6×10^{-12} μCi/mL$_{air}$. Results are similar between the sampling locations. All samples were significantly below the DOE DCS for tritium in air (as water vapor) of 1.3×10^{-7} μCi/mL$_{air}$ (see Table B-1 of Appendix B). Results are shown in Table C-4, Appendix C.

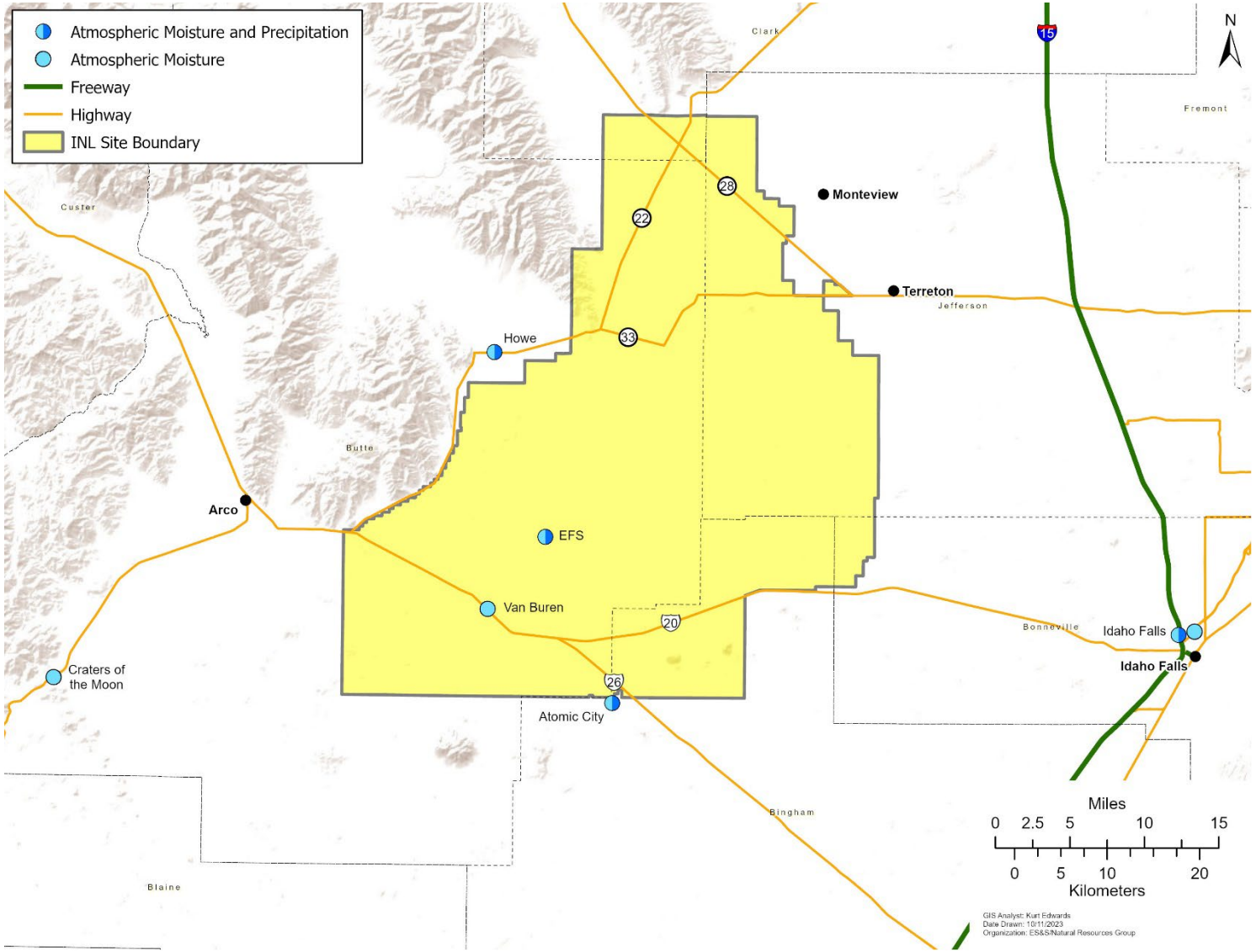

Figure 11. Atmospheric moisture and precipitation monitoring locations.

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4. Precipitation, Surface, and Water Sampling

4.1 Precipitation Sampling

Precipitation samples are gathered when enough precipitation occurs to allow for the collection of the minimum sample volume of approximately 50 mL. Samples are taken of monthly composites from Idaho Falls, and weekly (when available) from the EFS (onsite) and Atomic City and Howe (boundary) (Figure 11). These are the same locations where atmospheric moisture samples are collected. Precipitation samples are analyzed for tritium. Storm events in the fourth quarter of 2022 produced sufficient amounts of precipitation to yield 20 samples.

No samples measured tritium above the 3s values. These results are listed in Table C-5 (Appendix C). Low levels of tritium exist in the environment at all times as a result of cosmic ray reactions with water molecules in the upper atmosphere. Long-term data collected around the globe since 1961 by the International Atomic Energy Agency suggest that tritium levels have steadily decreased since the Nuclear Test Ban Treaty in 1963 and are close to their pre-nuclear test values (Cauquoin et al. 2015) and that there are no longer remnants of fallout from weapons testing. The maximum value in the fourth quarter was (104.00 ± 35.70) pCi/L in an Idaho Falls sample collected on December 31, 2022. The result does not exceed the 99%/95% UTL of 300 pCi/L. The result is well below the DCS for tritium in water (2.6×10^6 pCi/L) and within the range of historical values (-173 to 413 pCi/L) measured from 2012-2021.

4.2 Water Sampling

Drinking water samples were collected at eight locations. A control sample of bottled water was also prepared. Surface water samples were collected at three Thousand Springs locations (plus a duplicate). All samples were analyzed for gross alpha, gross beta, and tritium. Results are listed in Table C-6 of Appendix C.

Gross alpha activity was detected in five of the nine drinking water samples (Atomic City, Craters of the Moon, Howe, Rest Area, and Shoshone samples) and in one of the four surface water samples (Bill Jones, Jr. Trout Farm). The highest reported gross alpha value was (3.01 ± 0.51) pCi/L in the drinking water sample from Craters of the Moon. Gross beta activity was detected in 8 of the 9 drinking water samples (all except the control), and in all four of the surface water samples. All gross alpha and gross beta concentrations were similar to previous results from drinking and surface water sampling. Natural levels of radioactive decay products of thorium and uranium exist in the Snake River Plain Aquifer and are the likely source of the measured concentrations. The highest reported gross beta value was (7.50 ± 0.43) pCi/L in the duplicate surface water sample collected from Alpheus Springs near Twin Falls. This location has historically shown the highest levels of natural activity. Tritium was not detected in any of the drinking water samples or surface water samples.

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5. Agricultural Products, Soil, and Wildlife

Another potential pathway for contaminants to reach humans is through the food chain. The INL contractor samples multiple agricultural products and game animals from around the INL Site and southeast Idaho. Specifically, milk, alfalfa, grain, potatoes, lettuce, large game animals, and waterfowl are sampled. Milk is sampled throughout the year. Large game animals are sampled whenever they are killed onsite from vehicle collisions. Alfalfa is collected during the second quarter, lettuce and grain are sampled during the fourth quarter, while potatoes are collected during the third or fourth quarter. Waterfowl are collected in either the third or fourth quarter. See Table A-1, Appendix A, for a sampling schedule. This section discusses results from milk, potato, soil, wildlife, waterfowl, and external radiation samples available during the fourth quarter of 2022.

5.1 Milk Sampling

Milk samples were collected weekly at Rigby and Terreton. Monthly samples were collected at six other locations around the INL Site (Figure 12) during the fourth quarter of 2022. In addition to the regional locations, commercially-available organic milk (from Colorado) was purchased as a control sample each month. All samples were analyzed for gamma emitting radionuclides, with particular emphasis on ^{131}I.

Iodine-131 and ^{137}Cs were not detected in any weekly or monthly samples during the fourth quarter. No other human-made gamma-emitting radionuclides were found either. Data for ^{131}I and ^{137}Cs in milk samples are listed in Appendix C, Table C-7.

Tritium and ^{90}Sr were not detected in any milk sample. All results were similar to those previously measured and similar to those found in other liquid media like precipitation. The DCS for tritium and ^{90}Sr in milk is 1.2×10^7 pCi/L and 5.8×10^3 pCi/L, respectively. Data for tritium in milk samples are listed in Appendix C, Table C-8.

5.2 Potato Sampling

Regionally-grown potatoes from nine southeast Idaho locations (Figure 13) and one duplicate from Moreland were analyzed for gamma-emitting radionuclides like ^{137}Cs and for ^{90}Sr. A control sample from a local grocery store (grown in Ohio state) was also analyzed. No human-made gamma-emitters were found in any sample. Strontium-90 was not reported in any sample. Data for potato samples are listed in Appendix C, Table C-9.

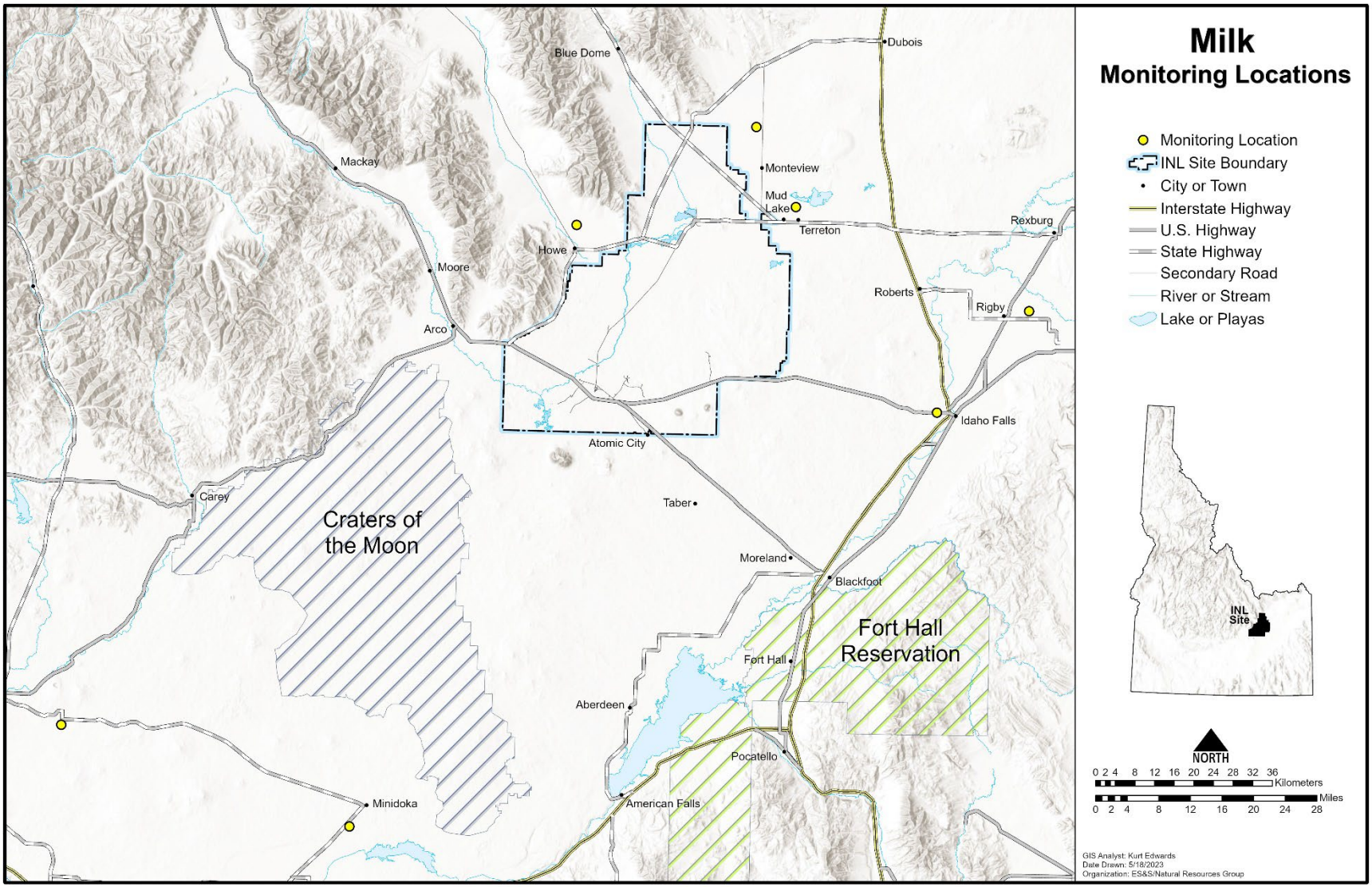

Figure 12. INL contractor milk monitoring locations.

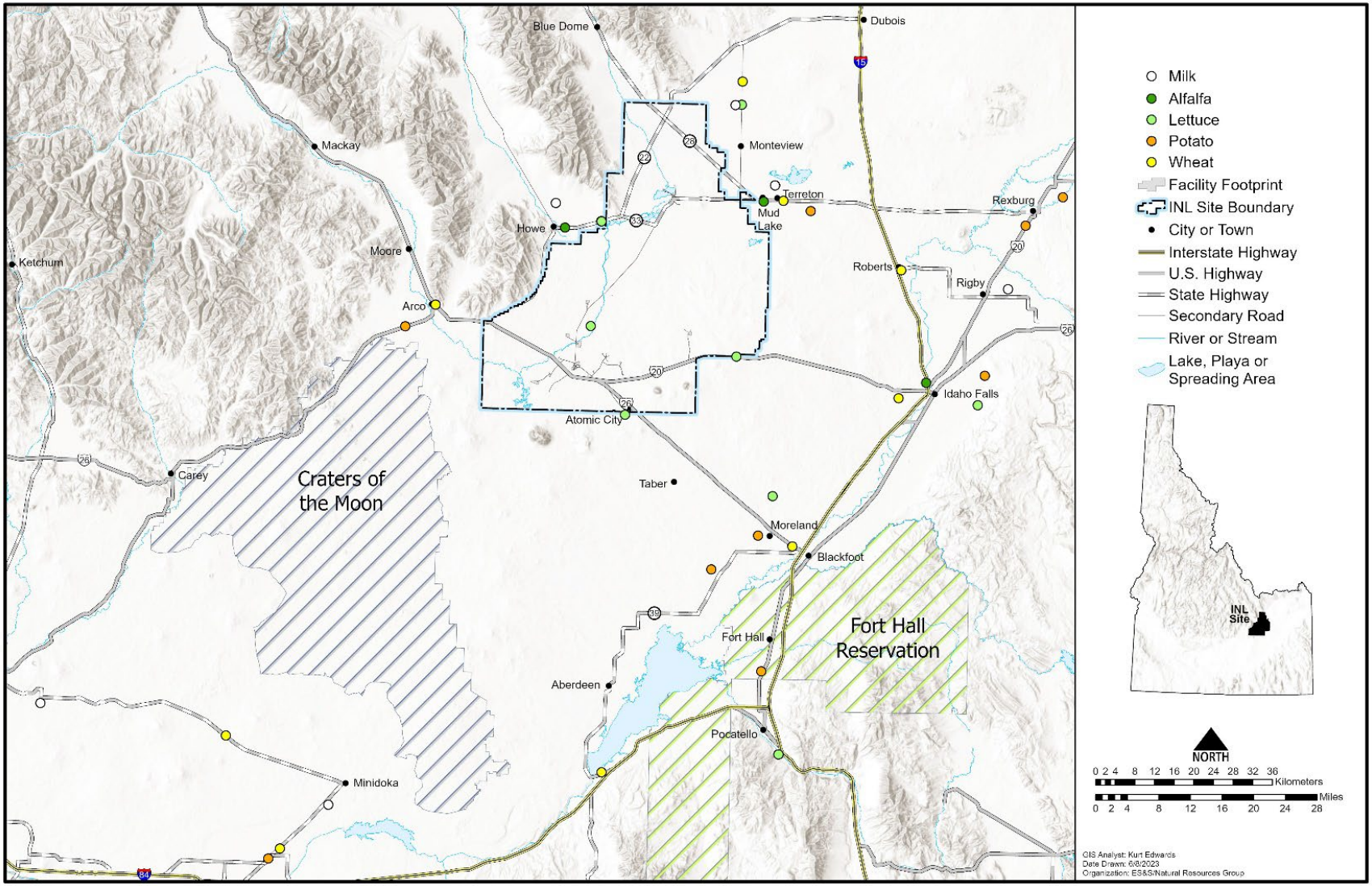

Figure 13. Locations of agricultural product samples collected (2022).

5.3 Soil Sampling

In the early 1970s, the DOE Radiological and Environmental Sciences Laboratory (RESL) established a routine program for collecting surface and subsurface soils (0–5 and 5–10 cm deep) on and around the INL Site. At that time, RESL established extensive onsite soil sampling grids outside INL Site facilities. Offsite locations were also established by RESL during this process to serve as background sites. RESL analyzed all samples (onsite and offsite) for gamma-emitting radionuclides with a subset onsite analyzed for ^{90}Sr, ^{241}Am, and isotopes of plutonium. In addition, all soil from the surface component (0–5 cm) of the offsite samples was analyzed for ^{90}Sr and alpha emitting-radionuclides (^{241}Am and isotopes of plutonium).

Between 1970 and 1978, RESL extensively sampled the onsite grids outside INL Site facilities and then reduced the onsite sampling frequency to a seven-year rotation that ended in 1990 with sampling at the Test Reactor Area (now known as the Advanced Test Reactor Complex). Surface soils were sampled at offsite and boundary locations off the INL Site annually from 1970 to 1975, and the collection interval for offsite soils was extended to every two years starting in 1978.

The INL contractor currently completes soil sampling on a five-year rotation at the INL Site to evaluate long-lived radionuclide trends and to estimate environmental radionuclide inventories. Sampling occurred in 2022 and is next scheduled for 2027. Data from previous years of soil sampling and analysis on the INL Site show slowly declining concentrations of short-lived radionuclides of human origin (e.g., ^{137}Cs), with no evidence of detectable concentrations depositing onto surface soil from ongoing INL Site releases, as discussed in INL (2016).

5.3.1 Soil Sampling Design

The basis for the current INL contractor soil sampling design is defined in the Data Quality Objectives Supporting the Environmental Soil Monitoring Program for the INL Site (INL 2016, INL 2022a). The data quality objectives used historical data, current emissions data, and soil-deposition modeling for establishing the quality and quantity of data needed to support decision making for protecting human health and the environment. Figure 14 shows the INL Site soil monitoring locations for 2022, most of which are near RWMC.

To determine the need for soil sampling, potential releases from each INL facility were modeled using CALPUFF, a non-steady state Lagrangian puff dispersion model (Rood and Sondrup 2014), and estimated particulate deposition rates (INL 2016). The results showed that for the onsite facilities only the RWMC has the potential for soil accumulations to be detectable in less than a decade. Results for the other facilities (e.g., INTEC and Materials and Fuels Complex) showed the potential for surface accumulations to be detectable only after hundreds to thousands of years (INL 2016). In addition, at best soil sampling is of questionable value in attempting to estimate small increments of deposition over a period of a few years or less because of the large uncertainties in sampling itself and the inherent variability in soil (EML 1997). Accordingly, the INL contractor uses a graded approach that takes into account extensive historical knowledge about soil conditions from past releases and current knowledge about facility emissions (INL 2016).

The INL contractor began performing near-facility monitoring at RWMC in 2017 on a five-year rotation focusing on radionuclides that could be detectable in the relative near term (i.e., plutonium isotopes, ^{90}Sr, and gamma emitters). The original sampling points established by RESL were selected as logical monitoring locations for data comparisons. Of the approximately 50 sampling points established by RESL, historical data were collected mostly southwest and northeast of the facility, with the highest radionuclide concentrations being in the prevalent wind direction to the northeast. For the current sampling, a systematic random sampling design was used to determine which of these points would be used as routine monitoring locations as shown in Figure 14.

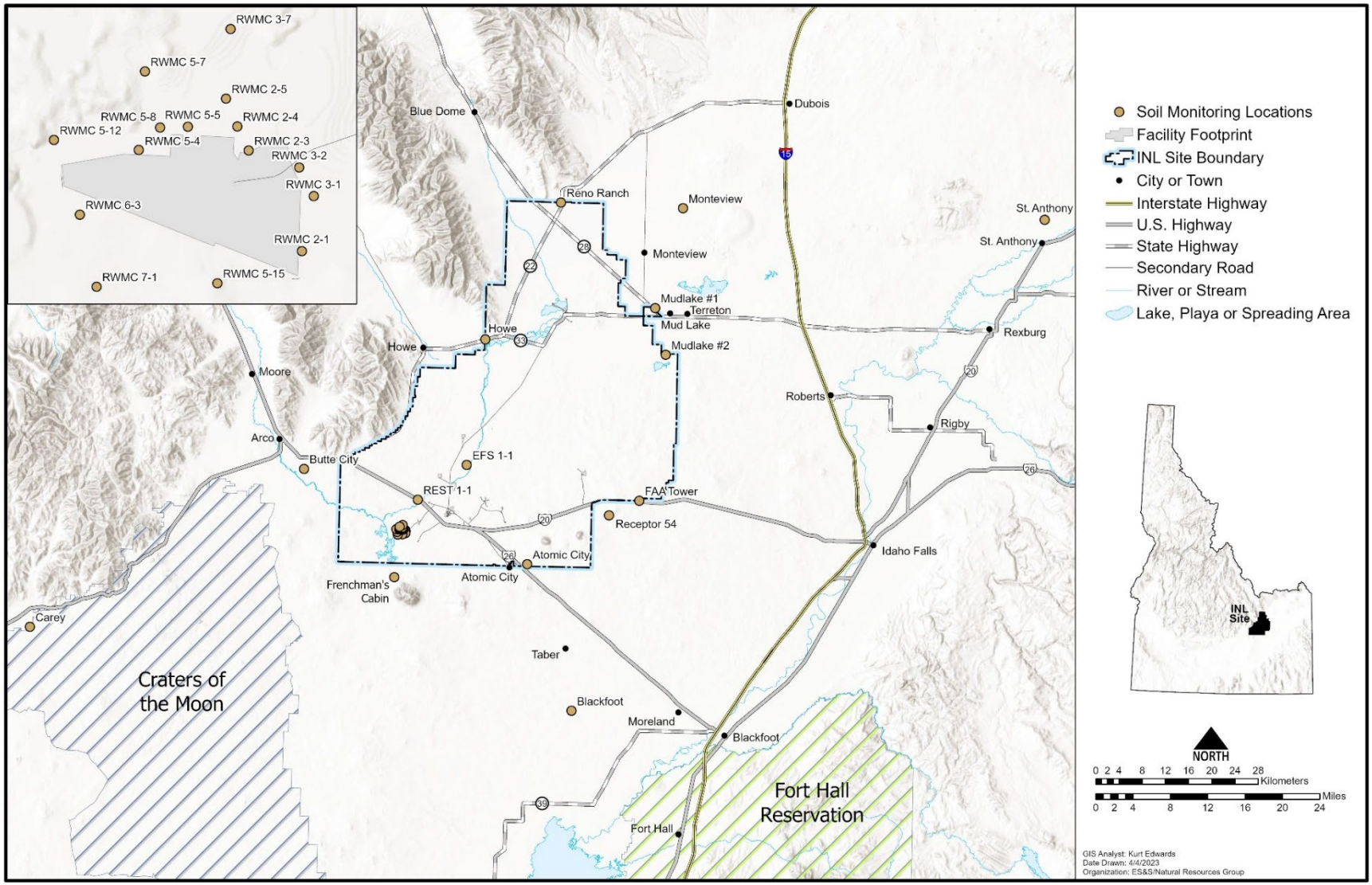

Figure 14. Soil sampling locations in 2022.

Additional soil monitoring away from RWMC includes two INL Site ambient air-monitoring locations (Highway 26 Rest Area and the EFS) that were chosen so that soil, ambient air, and direct radiation data can be compared. These locations were also chosen because they have higher modeled deposition potential from major facility emissions than other ambient air monitor locations.

5.3.2 Methods

Soil is collected near each sampling post in an undisturbed area in a 100-m^2 area. Using techniques and equipment similar to those developed by RESL, each sample is a composite of five cores. Using a hammer, samplers force a metal ring that resembles a 10-cm-diameter and 5-cm-deep cookie cutter into the ground at the corners and center of the 100-m^2 area. Discreet samples are collected from each of the two depths: 0–5 cm and 5–10 cm. The soil inside each subsample is sieved through a 35-mesh screen, mixed in a pan, and composited into a single jar for that location.

5.3.3 Soil Sampling Results

Samples were collected from locations described in Figure 14. Soil data for EFS, Highway 26 Rest Area, Frenchmans Cabin, and Receptor 54 is limited, therefore, no INL Site specific data are available for comparison to the current results. As more data are collected from these sites, background values will be computed and comparisons will be made. For the remaining sampling locations, sitewide background values are available and the radionuclides and concentrations at these locations are similar to those documented in Rood et al. (1996). Results obtained from monitoring sites were consistent with previous results and all the measured activities were less than the background values (Appendix C, Table C-10).

5.4 Large Game Animal Sampling

Two elk were available for sampling during the fourth quarter of 2022. Muscle, liver, and thyroid samples were taken from the two animals. No human-made gamma-emitting radionuclides were detected in any of the tissues. Results for the tissue samples are listed in Appendix C, Table C-11.

5.5 Waterfowl

Waterfowl are collected each year by the INL contractor at wastewater ponds on the INL Site and at a location off the INL Site. Three waterfowl were collected from wastewater ponds located at the Advanced Test Reactor (ATR) Complex, one was collected from INTEC, one was collected from SMC and three control waterfowl collected from Swan Valley. Each sample was divided into the following three sub-samples: (1) edible tissue (muscle, gizzard, heart, and liver); (2) external portion (feathers, feet, and head); and (3) all remaining tissue. All samples were analyzed for gamma-emitting radionuclides, ^{90}Sr, and actinides (^{241}Am, ^{238}Pu, and $^{239/240}Pu$). These radionuclides were selected because they have historically been measured in liquid effluents from some INL Site facilities.

Strontium-90 was found in the edible tissues at ATR Complex (Table C-12). No gamma-emitting radionuclides or actinides were detected in any of the edible tissues of the waterfowl collected in 2022.

The maximum potential dose from eating 225 g (8 oz) of duck meat collected in 2022 was calculated. Doses from consuming waterfowl are conservatively based on the assumption that ducks are eaten immediately after leaving the pond and no radioactive decay occurs. The maximum potential dose estimated from these waterfowl sample results is 0.0009 mrem.

6. External Radiation

An array of optically stimulated luminescent dosimeters (OSLDs) are distributed throughout the Eastern Snake River Plain and on the INL Site (Figure 15) to monitor for environmental radiation. In addition, neutron dose monitoring is conducted around INL facilities and buildings where neutron radiation may be present.

OSLD results from dosimeters collected during the fourth quarter of 2022 are displayed in Appendix C, Table C-13. Results are presented in dose units of millirem (mrem). Similar to the low-volume air results the environmental dosimeter locations are also divided into onsite, boundary and offsite groupings. The onsite OSLD values ranged from 44.90 mrem at IF-670E to 325.3 mrem at ICPP O-20, with an overall average of 74.58 mrem. This equates to an average daily dose of 0.41 mrem. The boundary OSLD values ranged from 47.0 mrem at Blue Dome to 77.70 mrem at RRL5, with an overall average of 61.86 mrem. This equates to an average daily dose of 0.34 mrem. Offsite results varied from 50.40 mrem at Dubois to 74.30 mrem at Roberts. The offsite average was 61.36 mrem, which also equates to 0.34 mrem per day. The reported results for dosimeters collected during fourth quarter 2022 were primarily below the background UTL values. Table 2 lists the locations that exceeded the background level UTL.

The facility dosimeters that exceeded the background UTL for the November 2022 collection period are located at Highway 22 (Hwy22), INTEC listed as Idaho Chemical Processing Plant (ICPP), and the RWMC (Table 1). The HWY 22 T28 location result is only slightly over the UTL. The ICPP result is the highest seen at that location since 2016. RWMC O-13A and RWMC O-9A are above the UTL but not significantly. The UTL exceedances for locations near INTEC and RWMC are most likely due to operations in those areas. All environmental dosimetry results were provided to the INL Radiation Control Department for their consideration.

Table 1. Dosimetry location above background level UTL.

Location	***Ambient dose (mrem)***	***Background UTL (mrem)***
Hwy22 T28	77.8	68.1
ICPP O-27	232.9	230.2
RWMC O-13A	90.6	88
RWMC O-9A	93.5	88

Neutron dose monitoring is conducted around buildings in Idaho Falls where sources may emit or generate neutron radiation. These buildings include: IF-652A Lindsay Building, IF-675 Portable Isotopic Neutron Spectroscopy Laboratory, IF-670 Bonneville County Technology Center, and IF-638 Physics Laboratory. Additional neutron dosimeters are placed at the INL Research Center along the south perimeter fence and at the background location Idaho Falls O-10. All neutron dosimeters collected were reported as 'M' which denotes the dose equivalents are below the minimum measurable quantity of 10 mrem. The background level for neutron dose is zero and the current dosimeters have a detection limit of 10 mrem. Any neutron dose measured is considered present due to sources inside the building. The INL contractor follows the recommendations of the manufacturer to prevent environmental damage to the neutron dosimetry by wrapping each in aluminum foil. To keep the foil intact, the dosimeter is inserted into an ultraviolet protective cloth pouch when deployed.

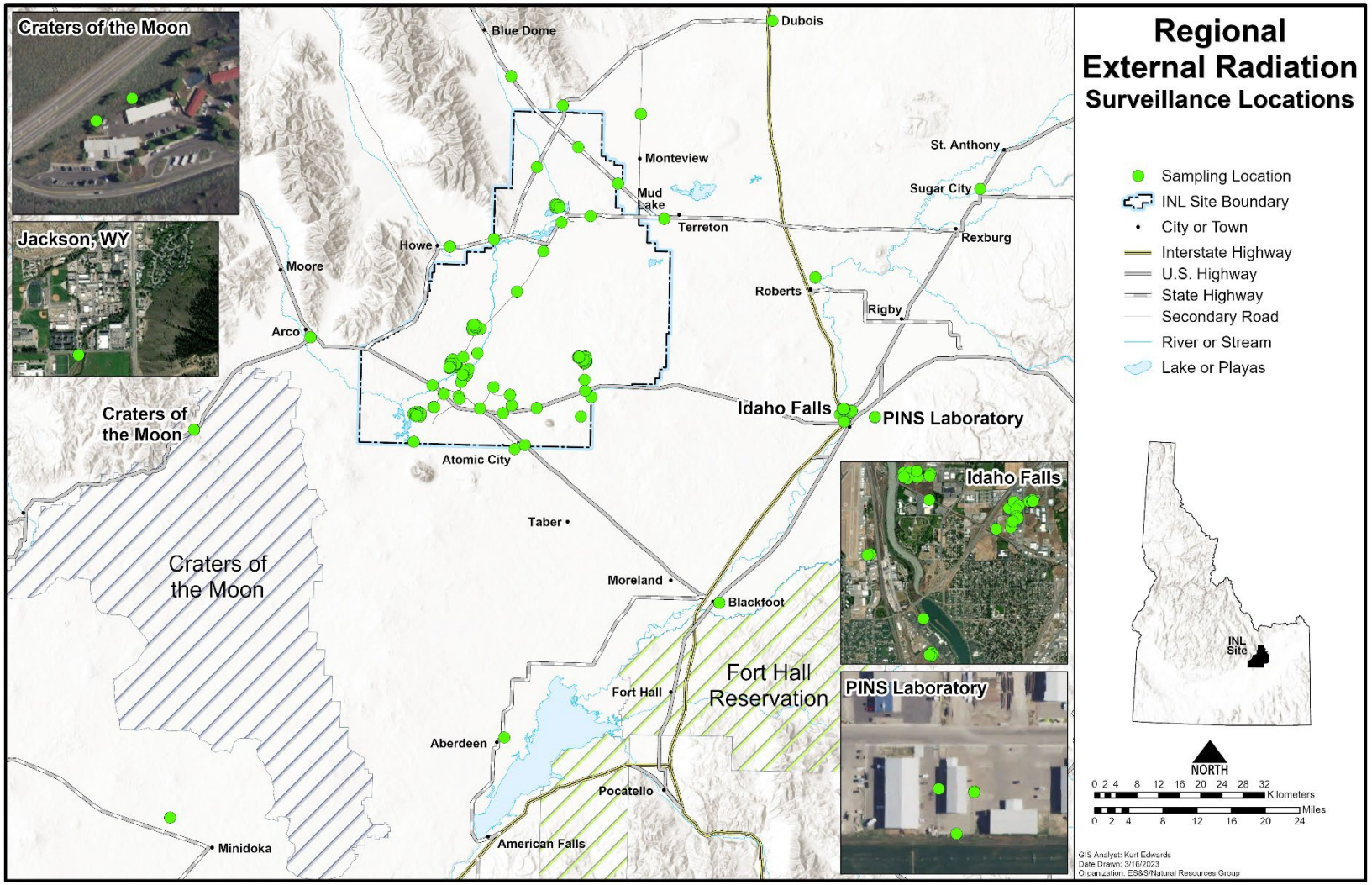

Figure 15. INL contractor OSLD locations.

7. Quality Assurance

Quality assurance consists of planned and systematic activities that give confidence in environmental surveillance program results (NCRP 2012). Environmental surveillance programs should provide data of known quality for the assessments and decisions being made. Quality assurance and quality control programs were maintained by the INL contractor and laboratories performing environmental analyses.

In addition to the quality assurance processes implemented by the INL contractor, the laboratories also utilize trained personnel, procedures, and quality assurance processes to ensure quality data. Data quality reviews were performed by the laboratory and any unusual conditions were addressed and identified in the case narrative prior to reporting to INL.

Field sampling elements, laboratory measurements, and quality control samples were reviewed and evaluated be the INL contractor laboratories. Results are summarized in Section 7.2-7.4. Together this information was used to assess the quality of data provided to INL contractor, and to follow-up and/or conduct a corrective action to improve processes when necessary. This multi-faceted approach to quality assurance and quality control added value to the INL contractor's monitoring program by providing confidence that all laboratory data reported in this report are reliable and of acceptable quality.

The INL contractor Quality Assurance Program consists of five ongoing tasks which measure: (1) method uncertainty; (2) data completeness; (3) data accuracy, using spike, performance evaluation and laboratory control samples; (4) data precision, using split samples, duplicate samples and recounts; and (5) presence of contamination in samples, using blanks.

Sample results are compared to criteria described in the *Environmental Monitoring Services Quality Assurance Project Plan* (INL 2022b).

Assessments of the INL contractor data quality are achieved through analysis of spike, performance evaluation, and duplicate samples; through sample recounts; through analysis of blank samples; and through comparison of sample results to established method quality objectives.

Required Criteria of a Quality Program

- Quality assurance program
- Personnel training and qualification
- Quality improvement process
- Documents and records
- Established work processes
- Established standards for design and verification
- Established procurement requirements
- Inspection and acceptance testing
- Management assessment
- Independent assessment

7.1 Inter-laboratory Program Performance Testing Evaluations

The Mixed Analyte Performance Evaluation Program (MAPEP) is an inter-laboratory program that uses performance testing evaluations to test the ability of the laboratories to correctly analyze radiological, non-radiological, stable organic, and stable inorganic constituents' representative of those at DOE sites. MAPEPs series are distributed to labs twice a year (January-March and July-September quarters).

For fourth quarter 2022, all laboratories used by the INL Site contractor participated in MAPEP Series 47 , except for the ALS Laboratory. The matrices along with the radioanalytes of interest that received a MAPEP nonagreement are discussed below. A 'not acceptable evaluation' is assigned to MAPEP results that are > +/-30% of the reference value. The analytical laboratory is responsible for reviewing their individual MAPEP results and correcting potential quality concerns identified by MAPEP. Additional information on MAPEP is available at: https://www.id.energy.gov/resl/mapep/mapep.html.

ALS

ALS did not participate in the second MAPEP series for 2022 due to closure of the lab in August 2022.

GEL Laboratories, LLC

GEL Laboratories received an agreement evaluation for 65 out of 66 radioanalytes. A nonagreement evaluation resulted for uranium-234 in soil. GEL Laboratories, LLC performance will be monitored for future MAPEP PT program samples to identify consecutive nonagreement evaluations.

Idaho State University-Environmental Assessment Laboratory

ISU-EAL received nonagreement evaluations for several matrices and radioanalytes of interest. The matrices and respective radioanalytes include air filter (^{65}Zn), soil (^{60}Co, ^{65}Zn), water (tritium), and vegetation (^{137}Cs, ^{57}Co, ^{60}Co).

A review of the evaluation results for Series 47 identified potential trends with a few matrices/analytes not meeting the acceptable criteria. As a result, a request was submitted to ISU-EAL to perform a for-cause-review. The ISU-EAL addressed the for-cause-review and identified a few issues: (1) reporting issue with false negatives, (2) selection of incorrect sample geometry, and (3) not following protocol for reporting results to MAPEP. The corrective actions included: posting a copy of the analysis protocol with a follow up discussion of the importance of following the protocol, and a visit to the laboratory from the MAPEP program personnel to provide additional training on the MAPEP process. ISU-EAL performance will be monitored for future trends.

7.2 Blanks

The INL contractor submits field blanks along with the regular samples to test for the introduction of contamination during the process of field collection, laboratory preparation, and laboratory analysis. In the event a data quality or trending issue is identified, a LabWay assessment will be created in order to track resolutions and/or corrective actions.

No concerns were identified in blanks that would indicate data quality or trending issues with sampling, handling, shipment, or analysis by the laboratory contributed to the actual sample results. Fourth quarter 2022 blanks are discussed below.

GEL Laboratories, LLC

A total of 36 analytes were analyzed by GEL in various media. The media analyzed included: air filters, quarterly air filter composites, milk and atmospheric moisture.

Idaho State University-Environmental Assessment Laboratory

A total of 34 analytes were analyzed by ISU-EAL in various media. The media analyzed included: air filters, quarterly air filter composites, milk and precipitation.

7.3 Duplicate/Replicate Samples

The INL contractor submits field duplicate/replicate samples with the regular samples to assess field collection, homogeneity, reproducibility, laboratory preparation, laboratory analysis, and precision. In the event a data quality or trending issue is identified, a LabWay assessment will be created in order to track resolutions and/or corrective actions.

No concerns were identified in duplicate/replicates that would indicate data quality or trending issues with sampling, handling, shipment, homogeneity, reproducibility, or preparation and analysis by the laboratory contributed to the actual sample results. Fourth quarter 2022 duplicate/replicate samples are discussed below.

GEL Laboratories, LLC

A total of 110 analytes were analyzed by GEL Laboratories in various media. The media analyzed included: air filters, quarterly air filter composites, and soils.

Idaho State University-Environmental Assessment Laboratory

A total of 33 analytes were analyzed by ISU-EAL in various media. The media analyzed included: air filters, quarterly air filter composites, milk, agricultural products, and surface water.

7.4 PE Samples

Performance Evaluation (PE) samples are prepared samples that contain known values of analyte(s) of interest to the specific project, INL Site contractor program, or laboratory. PE samples are used to assess analytical method specific laboratory performance and to check that the laboratory can be within criteria set by the specific project or program for known value sample recovery. The samples are matched as closely as possible to the specific media, analytes of interest, and expected concentration or activity levels appropriate for the specific project, program, or use in decision-making. In some cases, the PE sample matrix may differ from the field samples (i.e., using deionized water with a known amount of analyte to simulate an atmospheric moisture sample). The PE samples are generally submitted with batches of field samples so they are processed simultaneously in the laboratory.

Idaho State University-Environmental Assessment Laboratory

A total of 32 PE analytes for various matrices were analyzed by ISU-EAL during the fourth calendar quarter of 2022. The matrices included: quarterly air filter composites, lettuce, potato, wheat, and milk. The analysis performed included: gamma spectroscopy (^{57}Co, ^{60}Co, ^{134}Cs, ^{137}Cs, ^{54}Mn, ^{65}Zn) and tritium (^{3}H). ISU-EAL received an agreement evaluation on all but one analyte. Cs-134 in wheat received a nonagreement evaluation.

ISU-EAL determined that the nonagreement for ^{134}Cs in wheat was due to sample positioning on the detector for one of the analyses. ISU-EAL rejected the results from the analysis and recalculated the average value for the analyte. The updated average, when compared to the known value, met the evaluation criteria. The INL contractor will continue to monitor this analyte in the future.

GEL Laboratories, LLC

A total of 29 PE analytes for various matrices were analyzed by GEL during the fourth calendar quarter of 2022. The matrices included: quarterly air filter composites, lettuce, potato, wheat, milk, and soil. The analysis performed included: gamma spectroscopy (^{57}Co, ^{60}Co, ^{134}Cs, ^{137}Cs, ^{54}Mn, ^{65}Zn), alpha spectroscopy (^{241}Am,^{238}Pu, $^{239/240}$Pu, ^{234}U, ^{238}U), and ^{90}Sr. GEL received an agreement evaluation on all but three analytes. A nonagreement evaluation was received for ^{90}Sr in lettuce, and ^{57}Co and ^{54}Mn in soil. GEL was informed of the nonagreements and performed a “For Cause Review” for each media.

The laboratory determined that a fraction of the lettuce sample was used for analysis instead of the entire sample. Since the distribution of ^{90}Sr was not homogenous in the sample, a note was included on the chain of custody to use the entire sample. The fraction of sample used for analysis did not contain any of the ^{90}Sr resulting in a statistically zero value. GEL added additional comments for the project to prevent a similar incident from happening in the future.

The two nonagreements for ^{57}Co and ^{54}Mn in soil were reviewed and the lab determined the issue was due to the relatively short half-lives of the radionuclides, and the amount of time elapsed between the sample collection date and the known activity reference date. A review of previous soil PE samples determined GEL had received agreement evaluations for the two analytes. In addition, a review of the two MAPEP series for 2022 resulted in GEL receiving an agreement evaluation for ^{57}Co and ^{54}Mn in soil.

The INL contractor will continue to monitor GEL’s performance on these analytes in the future.

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Appendix A
Summary of Sampling Schedule

Table A-1. Summary of the INL contractor's sampling schedule.

Sample Type Analysis	Collection Frequency	Locations		
		Offsite	**Boundary**	**Onsite**
Air Sampling				
Low-Volume Air				
Gross Alpha, Gross Beta, ^{131}I	weekly	Blackfoot; Craters of the Moon; Dubois; Idaho Falls; IRC, IRC – North; Jackson, WY; Sugar City	Arco, Atomic City, Blue Dome, FAA Tower, Howe, Monteview, Mud Lake, Terreton	ATR Complex, CFA, EBR-I, EFS, Gate 4, Hwy 26 Rest Area, INTEC (NE corner), INTEC (westside), Main Gate, MFC – North, MFC – South, NRF, PBF, RHLLW, RWMC, RWMC – South, SMC, Van Buren
Gamma Spec	quarterly	Blackfoot; Craters of the Moon; Dubois; Idaho Falls; IRC; IRC – North, Jackson, WY; Sugar City	Arco, Atomic City, Blue Dome, FAA Tower, Howe, Monteview, Mud Lake, Terreton	ATR Complex, CFA, EBR-I, EFS, Gate 4, Hwy 26 Rest Area, INTEC (NE corner), INTEC (westside), Main Gate, MFC – North, MFC – South, NRF, PBF, RHLLW, RWMC, RWMC – South, SMC, Van Buren
^{90}Sr, Transuranics	quarterly	Blackfoot; Craters of the Moon; Dubois; Idaho Falls; IRC; IRC – North, Jackson, WY; Sugar City	Arco, Atomic City, Blue Dome, FAA Tower, Howe, Monteview, Mud Lake, Terreton	ATR Complex, CFA, EBR-I, EFS, Gate 4, Hwy 26 Rest Area, INTEC (NE corner), INTEC (westside), Main Gate, MFC – North, MFC – South, NRF, PBF, RHLLW, RWMC, RWMC – South, SMC, Van Buren
Atmospheric Moisture				
Tritium	2 to 13 weeks	Idaho Falls, Craters of the Moon	Atomic City, Howe	EFS, MFC, Van Buren
Precipitation				
Tritium	monthly	Idaho Falls	None	None
Tritium	weekly	None	Atomic City, Howe	EFS

Table A-1. continued.

Water Sampling				
Drinking Water				
Gross Alpha, Gross Beta, Tritium	semi-annually	Craters of the Moon, Idaho Falls, Minidoka, Shoshone	Atomic City, Howe, Mud Lake, Rest Area	None
Surface Water				
Gross Alpha, Gross Beta, Tritium	semi-annually	Buhl, Hagerman, Twin Falls	None	Big Lost River (when flowing)
External Radiation Sampling				
OSLDs				
Gamma Radiation	semiannual	Aberdeen; Blackfoot; Craters of the Moon; Dubois; Idaho Falls; Jackson, WY; Minidoka; Roberts; Sugar City	Arco, Atomic City, Birch Creek, Blue Dome, Howe, Monteview, Mud Lake Resident Receptor Locations	Advanced Test Reactor Complex; Auxiliary Reactor Area; Central Facilities Area; Experimental Breeder Reactor I; Experimental Field Station; Gate 4; Haul E; Haul W; Highway 20; Highway 22; Highway 28; Highway 33; Idaho Nuclear Technology and Engineering Center; Lincoln Boulevard; Materials and Fuels Complex; Naval Reactors Facility; Power Burst Facility Special Power Excursion Reactor; Radioactive Waste Management Complex; Remote-handled Low-level Waste; Resident Receptor Locations; Rest Area; Test Area North, Loss-of-Fluid Test; Transient Reactor Test; Van Buren

Table A-1. continued.

Neutron				
Neutron Radiation	semiannual	Idaho Falls	None	Materials and Fuels Complex; Remote-handled Low-level Waste
Soil Sampling				
Soil				
Gamma Spec, ^{90}Sr, Transuranics	biennially	Blackfoot, Carey, St. Anthony	Atomic City, Birch Creek, Butte City, FAA Tower, Frenchman's Cabin, Howe, Monteview, Mud Lake (2)	EFS, Hwy 26 Rest Area, RWMC
Agricultural Product Sampling				
Milk				
Gamma Spec (^{131}I)	weekly	Rigby	Terreton	None
Gamma Spec (^{131}I)	monthly	Dietrich, Minidoka, Monteview, Rigby	Howe, Terreton	None
Tritium, ^{90}Sr	Semi-annually	Dietrich, Minidoka, Monteview, Rigby	Howe, Terreton	None
Potatoes				
Gamma Spec, ^{90}Sr	annually	Varies among Blackfoot, Driggs, Hamer, Idaho Falls, Rupert, Shelley, occasional samples across the U.S.	Varies among Arco, Monteview, Mud Lake, Terreton	None
Alfalfa				
Gamma Spec, ^{90}Sr	annually	Idaho Falls	Howe, Mud Lake	None

Table A-1. continued.

Grain				
Gamma Spec, ^{90}Sr	annually	Varies among American Falls, Blackfoot, Carey, Idaho Falls, Roberts, Rupert/Minidoka	Varies among Arco, Monteview, Mud Lake, Taber, Terreton	None
Lettuce				
Gamma Spec, ^{90}Sr	annually	Varies among Blackfoot, Carey, Idaho Falls, Rigby, Sugar City	Varies among Arco, Atomic City, FAA Tower, Howe, Monteview	EFS
Wildlife Sampling				
Big Game				
Gamma Spec	varies	Occasional samples across the U.S.	Public Highways	INL Site roads
Waterfowl				
Gamma Spec, ^{90}Sr, Transuranics	annually	Varies among: American Falls, Firth, Fort Hall, Heise, Market Lake, Mud Lake	None	INL Site wastewater disposal ponds

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Appendix B
Summary of MDCs and DCSs

Table B-1. Summary of approximate MDC for radiological analyses performed during fourth quarter 2022.

Sample Type	Analysis	Average MDC[a]	DCS[b]
Air (particulate filter)[e]	Gross alpha	2.0×10^{-15} µCi/mL	1.1×10^{-13} µCi/ml[c]
	Gross beta	3.3×10^{-15} µCi/mL	9.6×10^{-12} µCi/ml[d]
	^{137}Cs	9.1×10^{-17} µCi/mL	3.8×10^{-11} µCi/ml
	^{90}Sr	8.0×10^{-17} µCi/mL	9.6×10^{-12} µCi/ml
	^{241}Am	1.3×10^{-17} µCi/mL	1.3×10^{-13} µCi/ml
	^{238}Pu	9.5×10^{-18} µCi/mL	1.2×10^{-13} µCi/ml
	$^{239/240}$Pu	1.0×10^{-17} µCi/mL	1.1×10^{-13} µCi/ml
Air (charcoal cartridge)[e]	^{131}I	3.2×10^{-13} µCi/mL	4.5×10^{-10} µCi/ml
Air (atmospheric moisture)	^{3}H	7.6×10^{-12} µCi/mL$_{air}$	1.3×10^{-7} µCi/ml$_{air}$
Air (precipitation)	^{3}H	90 pCi/L	2.6×10^{6} pCi/L
Milk	^{131}I	0.41 pCi/L	1.0×10^{4} pCi/L
	^{137}Cs	1.5 pCi/L	2.7×10^{4} pCi/L
	^{3}H	96 pCi/L	1.2×10^{7} pCi/L
	^{90}Sr	0.32 pCi/L	5.8×10^{3} pCi/L

a. The MDC is an estimate of the concentration of radioactivity in a given sample type that can be identified with a 95% level of confidence. MDCs are calculated and reported by the laboratories based on actual INL contractor sample results following analysis.
b. DCSs, set by the DOE, represent reference values for radiation exposure. They are based on a radiation dose of 100 mrem/yr for exposure through a particular exposure mode such as direct exposure, inhalation, or ingestion of water.
c. Based on the most restrictive human-made alpha emitter (^{239}Pu).
d. Based on the most restrictive human-made beta emitter (^{90}Sr).
e. The approximate MDC for air is based on an average filtered air volume (pressure corrected) of 445 m^3/week.

Appendix C
Sample Analysis Results

Table C-1. Weekly gross alpha and gross beta concentrations in air.

		GROSS ALPHA							GROSS BETA						
Sampling Group and Location	Sampling Date	Result ± 1s Uncertainty ($\times 10^{-15}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-11}$ Bq/mL)			Result > 3s	Result ± 1s Uncertainty ($\times 10^{-15}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-11}$ Bq/mL)			Result > 3s
BOUNDARY															
ARCO	10/05/22	2.26	±	0.30	8.36	±	1.11	Yes	28.60	±	0.86	105.82	±	3.18	Yes
	10/12/22	2.27	±	0.30	8.40	±	1.10	Yes	47.20	±	1.04	174.64	±	3.85	Yes
	10/19/22	1.35	±	0.28	5.00	±	1.03	Yes	21.50	±	0.83	79.55	±	3.07	Yes
	10/26/22	3.37	±	0.40	12.47	±	1.47	Yes	22.60	±	0.74	83.62	±	2.75	Yes
	11/02/22	3.19	±	0.40	11.80	±	1.49	Yes	34.00	±	0.86	125.80	±	3.19	Yes
	11/09/22	0.57	±	0.23	2.09	±	0.84	No	12.90	±	0.58	47.73	±	2.15	Yes
	11/15/22	3.07	±	0.41	11.36	±	1.52	Yes	39.60	±	0.99	146.52	±	3.65	Yes
	11/22/22	3.88	±	0.42	14.36	±	1.55	Yes	43.40	±	0.94	160.58	±	3.48	Yes
	11/29/22	1.78	±	0.27	6.59	±	1.00	Yes	34.10	±	0.91	126.17	±	3.35	Yes
	12/06/22	1.58	±	0.30	5.85	±	1.09	Yes	14.90	±	0.61	55.13	±	2.25	Yes
	12/13/22	0.26	±	0.20	0.97	±	0.75	No	20.40	±	0.74	75.48	±	2.75	Yes
	12/20/22	2.07	±	0.33	7.66	±	1.23	Yes	36.80	±	0.89	136.16	±	3.30	Yes
ATOMIC CITY	10/05/22	1.74	±	0.25	6.44	±	0.94	Yes	25.20	±	0.76	93.24	±	2.82	Yes
	10/12/22	2.54	±	0.30	9.40	±	1.10	Yes	54.00	±	1.05	199.80	±	3.89	Yes
	10/19/22	2.24	±	0.33	8.29	±	1.22	Yes	26.20	±	0.90	96.94	±	3.33	Yes
	10/26/22	3.44	±	0.41	12.73	±	1.50	Yes	29.30	±	0.83	108.41	±	3.06	Yes
	11/02/22	3.34	±	0.40	12.36	±	1.49	Yes	38.40	±	0.89	142.08	±	3.30	Yes
	11/09/22	1.05	±	0.27	3.89	±	0.98	Yes	13.30	±	0.59	49.21	±	2.19	Yes
	11/15/22	1.68	±	0.33	6.22	±	1.22	Yes	25.60	±	0.83	94.72	±	3.08	Yes
	11/22/22	3.82	±	0.41	14.13	±	1.50	Yes	45.70	±	0.94	169.09	±	3.47	Yes
	11/29/22	1.85	±	0.28	6.85	±	1.02	Yes	36.10	±	0.93	133.57	±	3.44	Yes
	12/06/22	0.83	±	0.26	3.07	±	0.95	Yes	12.40	±	0.60	45.88	±	2.21	Yes
	12/13/22	0.85	±	0.24	3.15	±	0.90	Yes	21.40	±	0.76	79.18	±	2.80	Yes
	12/20/22	2.34	±	0.38	8.66	±	1.42	Yes	44.40	±	1.05	164.28	±	3.89	Yes
BLUE DOME	10/05/22	0.86	±	0.32	3.16	±	1.19	No	14.40	±	0.99	53.28	±	3.66	Yes
	10/12/22	2.83	±	0.32	10.47	±	1.18	Yes	54.40	±	1.09	201.28	±	4.03	Yes
	10/19/22	1.63	±	0.32	6.03	±	1.19	Yes	19.60	±	0.87	72.52	±	3.23	Yes
	10/26/22	2.97	±	0.39	10.99	±	1.43	Yes	26.50	±	0.80	98.05	±	2.97	Yes
	11/02/22	2.84	±	0.39	10.51	±	1.43	Yes	33.60	±	0.86	124.32	±	3.19	Yes
	11/09/22	1.41	±	0.28	5.22	±	1.05	Yes	14.00	±	0.59	51.80	±	2.19	Yes
	11/15/22	3.35	±	0.41	12.40	±	1.52	Yes	30.90	±	0.86	114.33	±	3.19	Yes
	11/22/22	3.32	±	0.38	12.28	±	1.40	Yes	35.70	±	0.84	132.09	±	3.10	Yes
a	11/29/22		±		0.00	±	0.00	No		±		0.00	±	0.00	No
	12/06/22	1.39	±	0.28	5.14	±	1.05	Yes	16.40	±	0.63	60.68	±	2.33	Yes
	12/14/22	0.51	±	0.20	1.88	±	0.75	No	22.60	±	0.73	83.62	±	2.69	Yes
	12/20/22	1.89	±	0.35	6.99	±	1.29	Yes	38.30	±	0.97	141.71	±	3.59	Yes
FAA TOWER	10/05/22	1.49	±	0.25	5.51	±	0.91	Yes	28.50	±	0.83	105.45	±	3.05	Yes
	10/12/22	2.26	±	0.28	8.36	±	1.03	Yes	39.00	±	0.90	144.30	±	3.34	Yes
	10/19/22	1.71	±	0.28	6.33	±	1.02	Yes	24.10	±	0.80	89.17	±	2.96	Yes
	10/26/22	3.42	±	0.40	12.65	±	1.48	Yes	26.00	±	0.78	96.20	±	2.90	Yes
	11/02/22	2.96	±	0.39	10.95	±	1.44	Yes	30.10	±	0.82	111.37	±	3.02	Yes
	11/09/22	1.08	±	0.27	4.00	±	1.00	Yes	12.80	±	0.59	47.36	±	2.19	Yes
	11/15/22	2.10	±	0.35	7.77	±	1.28	Yes	33.90	±	0.90	125.43	±	3.32	Yes
	11/22/22	1.56	±	0.28	5.77	±	1.05	Yes	18.80	±	0.65	69.56	±	2.41	Yes
	11/29/22	0.65	±	0.20	2.40	±	0.73	Yes	17.40	±	0.69	64.38	±	2.55	Yes
	12/06/22	1.11	±	0.26	4.11	±	0.95	Yes	15.70	±	0.60	58.09	±	2.22	Yes
	12/13/22	0.29	±	0.20	1.05	±	0.73	No	18.30	±	0.69	67.71	±	2.56	Yes
	12/20/22	2.15	±	0.37	7.96	±	1.38	Yes	41.20	±	1.02	152.44	±	3.77	Yes
HOWE	10/05/22	1.70	±	0.29	6.29	±	1.05	Yes	27.80	±	0.90	102.86	±	3.32	Yes
a	10/12/22		±		0.00	±	0.00	No		±		0.00	±	0.00	No
	10/19/22	1.55	±	0.30	5.74	±	1.11	Yes	22.80	±	0.87	84.36	±	3.23	Yes
	10/26/22	3.14	±	0.41	11.62	±	1.51	Yes	27.40	±	0.84	101.38	±	3.11	Yes
	11/02/22	2.08	±	0.36	7.70	±	1.34	Yes	39.80	±	0.95	147.26	±	3.53	Yes
	11/09/22	1.48	±	0.30	5.48	±	1.12	Yes	12.40	±	0.60	45.88	±	2.22	Yes
	11/15/22	4.19	±	0.46	15.50	±	1.72	Yes	34.30	±	0.93	126.91	±	3.44	Yes
	11/22/22	3.98	±	0.42	14.73	±	1.54	Yes	46.60	±	0.95	172.42	±	3.52	Yes
	11/29/22	1.98	±	0.28	7.33	±	1.04	Yes	34.80	±	0.92	128.76	±	3.39	Yes

Table C-1. Weekly gross alpha and gross beta concentrations in air.

		GROSS ALPHA							GROSS BETA						
Sampling Group and Location	Sampling Date	Result ± 1s Uncertainty ($\times 10^{-15}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-11}$ Bq/mL)			Result > 3s	Result ± 1s Uncertainty ($\times 10^{-15}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-11}$ Bq/mL)			Result > 3s
	12/06/22	2.22	±	0.33	8.21	±	1.22	Yes	20.10	±	0.67	74.37	±	2.49	Yes
	12/13/22	0.65	±	0.23	2.42	±	0.85	No	23.60	±	0.78	87.32	±	2.89	Yes
	12/20/22	1.80	±	0.31	6.66	±	1.15	Yes	35.20	±	0.86	130.24	±	3.19	Yes
MONTEVIEW	10/05/22	1.49	±	0.25	5.51	±	0.94	Yes	28.40	±	0.84	105.08	±	3.12	Yes
	10/12/22	3.02	±	0.33	11.17	±	1.22	Yes	52.70	±	1.08	194.99	±	4.00	Yes
	10/19/22	2.03	±	0.31	7.51	±	1.15	Yes	21.10	±	0.81	78.07	±	3.01	Yes
	10/26/22	2.81	±	0.38	10.40	±	1.41	Yes	25.40	±	0.80	93.98	±	2.95	Yes
	11/02/22	3.46	±	0.43	12.80	±	1.57	Yes	33.30	±	0.88	123.21	±	3.24	Yes
	11/09/22	1.28	±	0.28	4.74	±	1.03	Yes	14.90	±	0.61	55.13	±	2.26	Yes
	11/15/22	2.05	±	0.34	7.59	±	1.25	Yes	29.80	±	0.84	110.26	±	3.12	Yes
	11/22/22	5.04	±	0.48	18.65	±	1.78	Yes	52.70	±	1.05	194.99	±	3.89	Yes
	11/29/22	1.73	±	0.27	6.40	±	1.00	Yes	33.40	±	0.91	123.58	±	3.36	Yes
	12/06/22	1.67	±	0.30	6.18	±	1.10	Yes	22.40	±	0.69	82.88	±	2.57	Yes
	12/13/22	0.78	±	0.23	2.88	±	0.85	Yes	20.60	±	0.72	76.22	±	2.68	Yes
	12/20/22	2.53	±	0.36	9.36	±	1.34	Yes	53.70	±	1.04	198.69	±	3.85	Yes
MUD LAKE	10/05/22	1.44	±	0.26	5.33	±	0.95	Yes	29.20	±	0.88	108.04	±	3.24	Yes
	10/12/22	3.00	±	0.32	11.10	±	1.18	Yes	45.20	±	0.98	167.24	±	3.62	Yes
	10/19/22	1.61	±	0.29	5.96	±	1.07	Yes	23.40	±	0.84	86.58	±	3.11	Yes
	10/26/22	3.74	±	0.42	13.84	±	1.55	Yes	29.70	±	0.83	109.89	±	3.08	Yes
	11/02/22	3.70	±	0.42	13.69	±	1.55	Yes	35.90	±	0.87	132.83	±	3.22	Yes
	11/09/22	0.86	±	0.25	3.19	±	0.94	Yes	14.30	±	0.61	52.91	±	2.25	Yes
	11/15/22	3.51	±	0.43	12.99	±	1.57	Yes	33.90	±	0.91	125.43	±	3.37	Yes
	11/22/22	3.71	±	0.40	13.73	±	1.49	Yes	44.20	±	0.93	163.54	±	3.43	Yes
	11/29/22	1.59	±	0.26	5.88	±	0.98	Yes	40.60	±	0.98	150.22	±	3.62	Yes
	12/06/22	1.35	±	0.28	5.00	±	1.02	Yes	19.60	±	0.66	72.52	±	2.43	Yes
	12/13/22	0.82	±	0.25	3.05	±	0.91	Yes	27.60	±	0.84	102.12	±	3.12	Yes
	12/20/22	1.94	±	0.36	7.18	±	1.32	Yes	45.80	±	1.05	169.46	±	3.89	Yes
TERRETON	10/05/22	2.03	±	0.35	7.51	±	1.29	Yes	20.50	±	0.83	75.85	±	3.07	Yes
	10/12/22	2.17	±	0.36	8.03	±	1.32	Yes	38.80	±	1.12	143.56	±	4.14	Yes
	10/19/22	1.04	±	0.26	3.85	±	0.98	Yes	23.60	±	0.90	87.32	±	3.32	Yes
	10/26/22	0.90	±	0.24	3.34	±	0.88	Yes	19.50	±	0.92	72.15	±	3.39	Yes
	11/02/22	1.59	±	0.30	5.88	±	1.11	Yes	24.50	±	0.90	90.65	±	3.33	Yes
	11/09/22	2.07	±	0.55	7.66	±	2.04	Yes	11.40	±	0.95	42.18	±	3.52	Yes
	11/15/22	1.17	±	0.30	4.33	±	1.09	Yes	26.50	±	1.13	98.05	±	4.18	Yes
	11/22/22	2.19	±	0.33	8.10	±	1.24	Yes	35.50	±	0.99	131.35	±	3.67	Yes
	11/29/22	1.97	±	0.35	7.29	±	1.29	Yes	30.80	±	1.20	113.96	±	4.44	Yes
	12/06/22	0.65	±	0.20	2.41	±	0.74	Yes	19.40	±	0.80	71.78	±	2.96	Yes
	12/13/22	1.16	±	0.30	4.29	±	1.11	Yes	19.10	±	0.79	70.67	±	2.93	Yes
	12/20/22	2.59	±	0.40	9.58	±	1.47	Yes	50.50	±	1.32	186.85	±	4.88	Yes
OFFSITE															
BLACKFOOT	10/05/22	1.40	±	0.29	5.18	±	1.06	Yes	17.50	±	0.72	64.75	±	2.66	Yes
	10/12/22	2.18	±	0.33	8.07	±	1.22	Yes	34.50	±	0.98	127.65	±	3.63	Yes
	10/19/22	1.67	±	0.32	6.18	±	1.18	Yes	21.00	±	0.90	77.70	±	3.33	Yes
	10/26/22	1.95	±	0.33	7.22	±	1.23	Yes	26.90	±	0.90	99.53	±	3.34	Yes
	11/02/22	1.32	±	0.30	4.88	±	1.10	Yes	20.50	±	0.78	75.85	±	2.87	Yes
	11/09/22	0.41	±	0.16	1.50	±	0.60	No	8.10	±	0.48	29.97	±	1.78	Yes
a	11/15/22		±		0.00	±	0.00	No		±		0.00	±	0.00	No
	11/22/22	2.16	±	0.38	7.99	±	1.40	Yes	36.40	±	1.36	134.68	±	5.03	Yes
	11/29/22	1.54	±	0.33	5.70	±	1.24	Yes	25.50	±	0.88	94.35	±	3.26	Yes
	12/06/22	1.12	±	0.27	4.14	±	0.99	Yes	13.40	±	0.63	49.58	±	2.34	Yes
	12/13/22	0.77	±	0.24	2.86	±	0.88	Yes	13.40	±	0.64	49.58	±	2.37	Yes
	12/20/22	1.73	±	0.32	6.40	±	1.19	Yes	32.40	±	0.98	119.88	±	3.64	Yes
CRATERS OF THE MOON	10/05/22	1.38	±	0.29	5.11	±	1.05	Yes	10.30	±	0.58	38.11	±	2.15	Yes
	10/12/22	1.38	±	0.32	5.11	±	1.19	Yes	21.20	±	0.82	78.44	±	3.03	Yes
	10/19/22	0.61	±	0.21	2.25	±	0.77	No	8.92	±	0.54	33.00	±	2.01	Yes
	10/26/22	0.94	±	0.26	3.49	±	0.97	Yes	9.42	±	0.57	34.85	±	2.10	Yes
	11/02/22	0.82	±	0.26	3.05	±	0.97	Yes	12.00	±	0.66	44.40	±	2.45	Yes
	11/09/22	0.07	±	0.16	0.27	±	0.58	No	5.57	±	0.46	20.61	±	1.71	Yes

Table C-1. Weekly gross alpha and gross beta concentrations in air.

		GROSS ALPHA							GROSS BETA						
Sampling Group and Location	Sampling Date	Result ± 1s Uncertainty ($\times 10^{-15}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-11}$ Bq/mL)			Result > 3s	Result ± 1s Uncertainty ($\times 10^{-15}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-11}$ Bq/mL)			Result > 3s
	11/15/22	0.78	±	0.25	2.87	±	0.92	Yes	14.60	±	0.69	54.02	±	2.55	Yes
	11/22/22	1.49	±	0.28	5.51	±	1.02	Yes	17.60	±	0.75	65.12	±	2.79	Yes
	11/29/22	0.83	±	0.22	3.07	±	0.80	Yes	10.40	±	0.61	38.48	±	2.26	Yes
	12/06/22	1.10	±	0.30	4.07	±	1.11	Yes	6.30	±	0.44	23.31	±	1.64	Yes
	12/13/22	0.21	±	0.21	0.77	±	0.78	No	8.38	±	0.50	31.01	±	1.84	Yes
	12/20/22	1.33	±	0.30	4.92	±	1.12	Yes	24.90	±	0.84	92.13	±	3.09	Yes
DUBOIS	10/05/22	0.89	±	0.20	3.30	±	0.75	Yes	12.80	±	0.61	47.36	±	2.24	Yes
	10/12/22	2.92	±	0.32	10.80	±	1.18	Yes	51.20	±	1.04	189.44	±	3.85	Yes
	10/19/22	1.16	±	0.28	4.29	±	1.05	Yes	14.10	±	0.76	52.17	±	2.81	Yes
	10/26/22	2.52	±	0.34	9.32	±	1.27	Yes	24.60	±	0.73	91.02	±	2.72	Yes
	11/02/22	3.37	±	0.39	12.47	±	1.45	Yes	31.80	±	0.80	117.66	±	2.97	Yes
	11/09/22	1.52	±	0.30	5.62	±	1.09	Yes	13.80	±	0.60	51.06	±	2.22	Yes
	11/15/22	4.20	±	0.46	15.54	±	1.68	Yes	25.50	±	0.82	94.35	±	3.02	Yes
	11/22/22	2.95	±	0.37	10.92	±	1.38	Yes	39.30	±	0.90	145.41	±	3.32	Yes
	11/29/22	1.73	±	0.27	6.40	±	1.01	Yes	36.20	±	0.94	133.94	±	3.49	Yes
	12/06/22	1.93	±	0.32	7.14	±	1.18	Yes	20.80	±	0.69	76.96	±	2.55	Yes
	12/13/22	1.17	±	0.27	4.33	±	0.98	Yes	20.50	±	0.75	75.85	±	2.79	Yes
	12/20/22	2.35	±	0.36	8.70	±	1.33	Yes	43.50	±	0.98	160.95	±	3.63	Yes
DUBOIS (QA)	10/05/22	3.50	±	0.55	12.95	±	2.04	Yes	56.80	±	1.73	210.16	±	6.40	Yes
	10/12/22	3.09	±	0.33	11.43	±	1.20	Yes	49.90	±	1.03	184.63	±	3.81	Yes
	10/19/22	1.67	±	0.26	6.18	±	0.97	Yes	15.70	±	0.66	58.09	±	2.45	Yes
	10/26/22	2.35	±	0.35	8.70	±	1.30	Yes	25.60	±	0.78	94.72	±	2.90	Yes
	11/02/22	3.23	±	0.40	11.95	±	1.48	Yes	34.10	±	0.85	126.17	±	3.16	Yes
	11/09/22	1.35	±	0.28	5.00	±	1.04	Yes	14.00	±	0.60	51.80	±	2.20	Yes
	11/15/22	1.94	±	0.33	7.18	±	1.23	Yes	24.00	±	0.78	88.80	±	2.89	Yes
	11/22/22	2.81	±	0.36	10.40	±	1.35	Yes	39.90	±	0.90	147.63	±	3.32	Yes
	11/29/22	2.12	±	0.30	7.84	±	1.10	Yes	37.40	±	0.96	138.38	±	3.56	Yes
	12/06/22	2.09	±	0.32	7.73	±	1.19	Yes	18.70	±	0.66	69.19	±	2.42	Yes
	12/13/22	1.24	±	0.27	4.59	±	1.00	Yes	20.00	±	0.75	74.00	±	2.77	Yes
	12/20/22	2.69	±	0.37	9.95	±	1.37	Yes	46.00	±	0.98	170.20	±	3.64	Yes
IDAHO FALLS	10/05/22	1.51	±	0.28	5.59	±	1.05	Yes	20.20	±	0.77	74.74	±	2.83	Yes
	10/12/22	2.74	±	0.39	10.14	±	1.43	Yes	34.10	±	1.02	126.17	±	3.77	Yes
	10/19/22	1.44	±	0.27	5.33	±	1.01	Yes	17.00	±	0.70	62.90	±	2.60	Yes
	10/26/22	1.80	±	0.31	6.66	±	1.14	Yes	27.50	±	0.94	101.75	±	3.49	Yes
	11/02/22	2.54	±	0.36	9.40	±	1.34	Yes	23.00	±	0.83	85.10	±	3.07	Yes
	11/09/22	0.52	±	0.20	1.92	±	0.72	No	9.53	±	0.56	35.26	±	2.05	Yes
	11/15/22	1.42	±	0.32	5.25	±	1.19	Yes	25.00	±	0.93	92.50	±	3.44	Yes
	11/22/22	2.26	±	0.34	8.36	±	1.24	Yes	31.70	±	0.93	117.29	±	3.45	Yes
	11/29/22	2.16	±	0.34	7.99	±	1.26	Yes	30.10	±	1.10	111.37	±	4.07	Yes
	12/06/22	1.12	±	0.27	4.14	±	1.00	Yes	13.80	±	0.65	51.06	±	2.41	Yes
	12/13/22	0.54	±	0.20	2.00	±	0.74	No	17.00	±	0.71	62.90	±	2.61	Yes
	12/20/22	1.52	±	0.32	5.62	±	1.17	Yes	34.50	±	1.09	127.65	±	4.03	Yes
IRC	10/05/22	1.91	±	0.32	7.07	±	1.18	Yes	19.50	±	0.83	72.15	±	3.09	Yes
	10/12/22	2.76	±	0.41	10.21	±	1.52	Yes	38.70	±	1.10	143.19	±	4.07	Yes
	10/19/22	1.07	±	0.27	3.96	±	1.00	Yes	17.80	±	0.72	65.86	±	2.68	Yes
	10/26/22	3.55	±	0.47	13.14	±	1.72	Yes	27.70	±	1.02	102.49	±	3.77	Yes
	11/02/22	1.71	±	0.32	6.33	±	1.19	Yes	22.30	±	0.82	82.51	±	3.02	Yes
	11/09/22	0.67	±	0.19	2.49	±	0.69	Yes	8.82	±	0.48	32.63	±	1.78	Yes
	11/15/22	1.64	±	0.34	6.07	±	1.27	Yes	26.70	±	0.95	98.79	±	3.53	Yes
	11/22/22	2.56	±	0.37	9.47	±	1.37	Yes	31.90	±	0.92	118.03	±	3.41	Yes
	11/29/22	3.90	±	0.99	14.43	±	3.65	Yes	35.50	±	1.94	131.35	±	7.18	Yes
	12/06/22	0.90	±	0.26	3.34	±	0.97	Yes	14.50	±	0.73	53.65	±	2.72	Yes
	12/13/22	0.80	±	0.25	2.95	±	0.93	Yes	15.30	±	0.75	56.61	±	2.77	Yes
	12/20/22	1.81	±	0.39	6.70	±	1.42	Yes	37.70	±	1.08	139.49	±	4.00	Yes
IRC NORTH	10/05/22	1.27	±	0.28	4.70	±	1.04	Yes	17.60	±	0.74	65.12	±	2.72	Yes
	10/12/22	2.22	±	0.36	8.21	±	1.33	Yes	32.20	±	1.01	119.14	±	3.74	Yes
	10/19/22	1.38	±	0.28	5.11	±	1.04	Yes	17.70	±	0.74	65.49	±	2.73	Yes
	10/26/22	1.79	±	0.33	6.62	±	1.22	Yes	24.90	±	0.88	92.13	±	3.27	Yes

Table C-1. Weekly gross alpha and gross beta concentrations in air.

Sampling Group and Location	Sampling Date	GROSS ALPHA Result ± 1s Uncertainty ($\times 10^{-15}$ µCi/mL)	GROSS ALPHA Result ± 1s Uncertainty ($\times 10^{-11}$ Bq/mL)	GROSS ALPHA Result > 3s	GROSS BETA Result ± 1s Uncertainty ($\times 10^{-15}$ µCi/mL)	GROSS BETA Result ± 1s Uncertainty ($\times 10^{-11}$ Bq/mL)	GROSS BETA Result > 3s
	11/02/22	1.96 ± 0.34	7.25 ± 1.25	Yes	21.30 ± 0.81	78.81 ± 3.01	Yes
	11/09/22	0.27 ± 0.18	1.00 ± 0.68	No	9.87 ± 0.53	36.52 ± 1.96	Yes
	11/15/22	1.57 ± 0.34	5.81 ± 1.27	Yes	28.80 ± 1.09	106.56 ± 4.03	Yes
	11/22/22	2.66 ± 0.37	9.84 ± 1.35	Yes	31.10 ± 0.93	115.07 ± 3.43	Yes
	11/29/22	1.77 ± 0.35	6.55 ± 1.30	Yes	28.00 ± 0.91	103.60 ± 3.37	Yes
	12/06/22	0.62 ± 0.27	2.28 ± 0.98	No	12.50 ± 0.61	46.25 ± 2.25	Yes
	12/13/22	0.98 ± 0.24	3.63 ± 0.88	Yes	13.70 ± 0.69	50.69 ± 2.54	Yes
	12/20/22	1.07 ± 0.30	3.96 ± 1.11	Yes	40.00 ± 1.20	148.00 ± 4.44	Yes
JACKSON, WY	10/05/22	1.51 ± 0.25	5.59 ± 0.92	Yes	26.50 ± 0.81	98.05 ± 2.98	Yes
	10/12/22	2.56 ± 0.31	9.47 ± 1.16	Yes	50.80 ± 1.07	187.96 ± 3.96	Yes
	10/19/22	1.53 ± 0.27	5.66 ± 1.01	Yes	25.80 ± 0.84	95.46 ± 3.12	Yes
	10/26/22	3.08 ± 0.40	11.40 ± 1.49	Yes	25.00 ± 0.81	92.50 ± 2.98	Yes
	11/02/22	4.05 ± 0.45	14.99 ± 1.66	Yes	33.00 ± 0.87	122.10 ± 3.22	Yes
	11/09/22	0.78 ± 0.25	2.87 ± 0.92	Yes	12.60 ± 0.59	46.62 ± 2.17	Yes
	11/15/22	2.42 ± 0.38	8.95 ± 1.40	Yes	28.30 ± 0.87	104.71 ± 3.23	Yes
	11/22/22	2.46 ± 0.38	9.10 ± 1.39	Yes	33.30 ± 0.91	123.21 ± 3.35	Yes
	11/29/22	1.25 ± 0.27	4.63 ± 0.98	Yes	30.20 ± 0.93	111.74 ± 3.46	Yes
	12/06/22	1.54 ± 0.31	5.70 ± 1.14	Yes	21.20 ± 0.72	78.44 ± 2.68	Yes
	12/13/22	0.65 ± 0.24	2.39 ± 0.89	No	21.90 ± 0.79	81.03 ± 2.91	Yes
	12/20/22	1.84 ± 0.33	6.81 ± 1.21	Yes	31.10 ± 0.85	115.07 ± 3.16	Yes
SUGAR CITY	10/05/22	0.94 ± 0.24	3.48 ± 0.88	Yes	18.20 ± 0.86	67.34 ± 3.20	Yes
	10/12/22	2.83 ± 0.39	10.47 ± 1.43	Yes	38.00 ± 1.14	140.60 ± 4.22	Yes
	10/19/22	1.12 ± 0.26	4.14 ± 0.97	Yes	16.10 ± 0.69	59.57 ± 2.57	Yes
	10/26/22	2.79 ± 0.38	10.32 ± 1.40	Yes	25.70 ± 0.87	95.09 ± 3.23	Yes
	11/02/22	1.37 ± 0.31	5.07 ± 1.14	Yes	24.70 ± 1.06	91.39 ± 3.92	Yes
	11/09/22	-0.04 ± 0.17	-0.13 ± 0.61	No	9.62 ± 0.58	35.59 ± 2.14	Yes
	11/15/22	1.08 ± 0.30	4.00 ± 1.09	Yes	24.00 ± 0.96	88.80 ± 3.56	Yes
	11/22/22	2.63 ± 0.37	9.73 ± 1.38	Yes	27.70 ± 0.91	102.49 ± 3.35	Yes
	11/29/22	3.29 ± 0.44	12.17 ± 1.62	Yes	30.10 ± 1.04	111.37 ± 3.85	Yes
	12/06/22	1.02 ± 0.26	3.77 ± 0.94	Yes	9.96 ± 0.52	36.85 ± 1.93	Yes
	12/13/22	0.67 ± 0.25	2.48 ± 0.91	No	13.10 ± 0.61	48.47 ± 2.27	Yes
	12/20/22	2.00 ± 0.37	7.40 ± 1.37	Yes	32.70 ± 0.99	120.99 ± 3.67	Yes
ONSITE							
ATR COMPLEX	10/05/22	2.05 ± 0.35	7.59 ± 1.29	Yes	19.90 ± 0.79	73.63 ± 2.92	Yes
	10/12/22	3.08 ± 0.42	11.40 ± 1.57	Yes	34.30 ± 1.29	126.91 ± 4.77	Yes
	10/19/22	1.66 ± 0.32	6.14 ± 1.17	Yes	14.90 ± 0.70	55.13 ± 2.58	Yes
	10/26/22	2.29 ± 0.40	8.47 ± 1.48	Yes	26.60 ± 0.91	98.42 ± 3.38	Yes
	11/02/22	2.27 ± 0.33	8.40 ± 1.24	Yes	27.00 ± 0.91	99.90 ± 3.36	Yes
	11/09/22	0.58 ± 0.22	2.16 ± 0.83	No	9.79 ± 0.60	36.22 ± 2.23	Yes
	11/15/22	1.71 ± 0.32	6.33 ± 1.17	Yes	21.60 ± 0.85	79.92 ± 3.13	Yes
	11/22/22	1.81 ± 0.30	6.70 ± 1.12	Yes	29.20 ± 1.11	108.04 ± 4.11	Yes
	11/29/22	1.85 ± 0.35	6.85 ± 1.31	Yes	26.80 ± 1.11	99.16 ± 4.11	Yes
	12/06/22	1.10 ± 0.28	4.07 ± 1.02	Yes	14.60 ± 0.67	54.02 ± 2.46	Yes
	12/13/22	0.67 ± 0.24	2.48 ± 0.90	No	15.00 ± 0.68	55.50 ± 2.51	Yes
	12/20/22	1.89 ± 0.33	6.99 ± 1.23	Yes	33.10 ± 1.24	122.47 ± 4.59	Yes
CFA [a]	10/05/22	±	0.00 ± 0.00	No	±	0.00 ± 0.00	No
	10/12/22	3.06 ± 0.45	11.32 ± 1.66	Yes	42.20 ± 1.41	156.14 ± 5.22	Yes
	10/19/22	0.84 ± 0.30	3.09 ± 1.11	No	22.40 ± 1.14	82.88 ± 4.22	Yes
	10/26/22	1.39 ± 0.26	5.14 ± 0.97	Yes	27.30 ± 0.87	101.01 ± 3.22	Yes
	11/02/22	1.80 ± 0.31	6.66 ± 1.14	Yes	22.00 ± 0.77	81.40 ± 2.85	Yes
	11/09/22	0.15 ± 0.18	0.57 ± 0.68	No	9.32 ± 0.57	34.48 ± 2.09	Yes
	11/15/22	1.73 ± 0.33	6.40 ± 1.21	Yes	24.60 ± 0.87	91.02 ± 3.23	Yes
	11/22/22	2.90 ± 0.41	10.73 ± 1.50	Yes	37.30 ± 1.15	138.01 ± 4.26	Yes
	11/29/22	1.90 ± 0.34	7.03 ± 1.26	Yes	19.30 ± 0.78	71.41 ± 2.88	Yes
	12/06/22	0.94 ± 0.26	3.47 ± 0.97	Yes	15.00 ± 0.76	55.50 ± 2.81	Yes
	12/13/22	0.91 ± 0.26	3.37 ± 0.97	Yes	17.90 ± 0.85	66.23 ± 3.13	Yes
	12/20/22	1.45 ± 0.30	5.37 ± 1.11	Yes	33.50 ± 0.98	123.95 ± 3.63	Yes
EBR-I	10/05/22	1.94 ± 0.33	7.18 ± 1.23	Yes	18.10 ± 0.76	66.97 ± 2.83	Yes

Table C-1. Weekly gross alpha and gross beta concentrations in air.

Sampling Group and Location		Sampling Date	GROSS ALPHA Result ± 1s Uncertainty ($\times 10^{-15}$ µCi/mL)			GROSS ALPHA Result ± 1s Uncertainty ($\times 10^{-11}$ Bq/mL)			GROSS ALPHA Result > 3s	GROSS BETA Result ± 1s Uncertainty ($\times 10^{-15}$ µCi/mL)			GROSS BETA Result ± 1s Uncertainty ($\times 10^{-11}$ Bq/mL)			GROSS BETA Result > 3s
		10/12/22	3.16	±	0.43	11.69	±	1.59	Yes	34.80	±	1.09	128.76	±	4.03	Yes
		10/19/22	1.39	±	0.32	5.14	±	1.20	Yes	18.20	±	0.80	67.34	±	2.97	Yes
		10/26/22	1.68	±	0.33	6.22	±	1.20	Yes	27.70	±	0.93	102.49	±	3.44	Yes
		11/02/22	1.84	±	0.30	6.81	±	1.12	Yes	20.50	±	0.77	75.85	±	2.83	Yes
		11/09/22	0.46	±	0.19	1.69	±	0.72	No	11.50	±	0.56	42.55	±	2.07	Yes
		11/15/22	1.84	±	0.34	6.81	±	1.26	Yes	26.40	±	0.93	97.68	±	3.45	Yes
		11/22/22	2.31	±	0.36	8.55	±	1.31	Yes	36.50	±	1.22	135.05	±	4.51	Yes
		11/29/22	1.69	±	0.33	6.25	±	1.22	Yes	29.20	±	0.97	108.04	±	3.60	Yes
		12/06/22	1.19	±	0.29	4.40	±	1.07	Yes	12.20	±	0.63	45.14	±	2.33	Yes
		12/13/22	0.67	±	0.32	2.49	±	1.19	No	19.30	±	0.86	71.41	±	3.20	Yes
		12/20/22	1.59	±	0.37	5.88	±	1.37	Yes	36.00	±	1.09	133.20	±	4.03	Yes
EFS	a	10/05/22		±		0.00	±	0.00	No		±		0.00	±	0.00	No
	a	10/12/22		±		0.00	±	0.00	No		±		0.00	±	0.00	No
		10/19/22	1.53	±	0.35	5.66	±	1.30	Yes	23.60	±	1.06	87.32	±	3.92	Yes
		10/26/22	1.80	±	0.38	6.66	±	1.41	Yes	30.30	±	1.25	112.11	±	4.63	Yes
		11/02/22	2.42	±	0.38	8.95	±	1.41	Yes	37.30	±	1.11	138.01	±	4.11	Yes
		11/09/22	0.45	±	0.20	1.67	±	0.73	No	10.50	±	0.62	38.85	±	2.28	Yes
		11/15/22	1.77	±	0.33	6.55	±	1.23	Yes	24.40	±	0.94	90.28	±	3.46	Yes
		11/22/22	2.08	±	0.33	7.70	±	1.22	Yes	33.20	±	1.08	122.84	±	4.00	Yes
		11/29/22	1.67	±	0.31	6.18	±	1.13	Yes	24.80	±	0.81	91.76	±	2.99	Yes
		12/06/22	0.86	±	0.24	3.17	±	0.87	Yes	13.90	±	0.62	51.43	±	2.29	Yes
		12/13/22	1.20	±	0.26	4.44	±	0.98	Yes	14.40	±	0.63	53.28	±	2.33	Yes
		12/20/22	2.03	±	0.35	7.51	±	1.29	Yes	42.80	±	1.21	158.36	±	4.48	Yes
GATE4		10/05/22	1.57	±	0.33	5.81	±	1.20	Yes	20.00	±	0.80	74.00	±	2.96	Yes
		10/12/22	2.49	±	0.39	9.21	±	1.44	Yes	38.10	±	1.09	140.97	±	4.03	Yes
		10/19/22	1.05	±	0.25	3.89	±	0.93	Yes	17.70	±	0.77	65.49	±	2.86	Yes
		10/26/22	0.53	±	0.21	1.94	±	0.77	No	16.40	±	0.71	60.68	±	2.61	Yes
		11/02/22	2.28	±	0.33	8.44	±	1.21	Yes	25.20	±	0.92	93.24	±	3.39	Yes
		11/09/22	1.37	±	0.29	5.07	±	1.08	Yes	9.72	±	0.53	35.96	±	1.96	Yes
		11/15/22	1.76	±	0.34	6.51	±	1.24	Yes	19.80	±	0.87	73.26	±	3.23	Yes
		11/22/22	2.61	±	0.37	9.66	±	1.36	Yes	31.60	±	1.00	116.92	±	3.70	Yes
		11/29/22	1.62	±	0.34	5.99	±	1.27	Yes	27.10	±	0.94	100.27	±	3.47	Yes
		12/06/22	1.74	±	0.34	6.44	±	1.24	Yes	24.00	±	0.88	88.80	±	3.27	Yes
		12/13/22	0.83	±	0.27	3.06	±	1.01	Yes	19.20	±	0.75	71.04	±	2.77	Yes
		12/20/22	2.14	±	0.38	7.92	±	1.42	Yes	52.10	±	1.39	192.77	±	5.14	Yes
HIGHWAY 26 REST AREA		10/05/22	1.31	±	0.27	4.85	±	1.01	Yes	18.50	±	0.87	68.45	±	3.21	Yes
		10/12/22	1.78	±	0.37	6.59	±	1.37	Yes	32.80	±	1.01	121.36	±	3.74	Yes
		10/19/22	1.51	±	0.30	5.59	±	1.11	Yes	20.60	±	0.88	76.22	±	3.25	Yes
		10/26/22	1.70	±	0.32	6.29	±	1.20	Yes	27.70	±	0.95	102.49	±	3.52	Yes
		11/02/22	2.07	±	0.33	7.66	±	1.23	Yes	27.30	±	0.94	101.01	±	3.46	Yes
		11/09/22	0.87	±	0.24	3.22	±	0.89	Yes	11.60	±	0.59	42.92	±	2.19	Yes
		11/15/22	1.49	±	0.30	5.51	±	1.12	Yes	23.60	±	0.91	87.32	±	3.35	Yes
		11/22/22	1.95	±	0.34	7.22	±	1.26	Yes	31.50	±	1.06	116.55	±	3.92	Yes
		11/29/22	2.27	±	0.36	8.40	±	1.33	Yes	29.70	±	0.92	109.89	±	3.42	Yes
		12/06/22	1.05	±	0.28	3.89	±	1.02	Yes	12.40	±	0.62	45.88	±	2.30	Yes
		12/13/22	1.36	±	0.31	5.03	±	1.13	Yes	20.10	±	0.80	74.37	±	2.96	Yes
		12/20/22	1.47	±	0.30	5.44	±	1.10	Yes	22.60	±	0.82	83.62	±	3.02	Yes
INTEC (NE CORNER)		10/05/22	0.55	±	0.22	2.02	±	0.81	No	17.10	±	0.69	63.27	±	2.57	Yes
		10/12/22	2.07	±	0.32	7.66	±	1.18	Yes	25.20	±	0.83	93.24	±	3.08	Yes
		10/19/22	0.88	±	0.26	3.26	±	0.96	Yes	22.00	±	1.05	81.40	±	3.89	Yes
		10/26/22	1.94	±	0.33	7.18	±	1.21	Yes	26.30	±	1.06	97.31	±	3.92	Yes
		11/02/22	2.46	±	0.36	9.10	±	1.32	Yes	26.20	±	0.87	96.94	±	3.22	Yes
		11/09/22	0.25	±	0.14	0.91	±	0.52	No	9.00	±	0.52	33.30	±	1.94	Yes
		11/15/22	1.99	±	0.36	7.36	±	1.32	Yes	25.90	±	0.92	95.83	±	3.40	Yes
		11/22/22	2.60	±	0.36	9.62	±	1.32	Yes	30.00	±	0.91	111.00	±	3.37	Yes
		11/29/22	2.20	±	0.37	8.14	±	1.37	Yes	26.70	±	0.88	98.79	±	3.25	Yes
		12/06/22	1.24	±	0.29	4.59	±	1.06	Yes	14.60	±	0.68	54.02	±	2.52	Yes
		12/13/22	1.47	±	0.38	5.44	±	1.39	Yes	16.40	±	0.74	60.68	±	2.72	Yes

Table C-1. Weekly gross alpha and gross beta concentrations in air.

		GROSS ALPHA							GROSS BETA						
Sampling Group and Location	Sampling Date	Result ± 1s Uncertainty ($\times 10^{-15}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-11}$ Bq/mL)			Result > 3s	Result ± 1s Uncertainty ($\times 10^{-15}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-11}$ Bq/mL)			Result > 3s
	12/20/22	2.31	±	0.37	8.55	±	1.37	Yes	30.80	±	1.26	113.96	±	4.66	Yes
INTEC (QA)	10/05/22	1.68	±	0.34	6.22	±	1.24	Yes	21.30	±	0.87	78.81	±	3.21	Yes
	10/12/22	2.43	±	0.36	8.99	±	1.34	Yes	35.60	±	1.19	131.72	±	4.40	Yes
	10/19/22	0.87	±	0.22	3.20	±	0.81	Yes	19.00	±	0.80	70.30	±	2.94	Yes
	10/26/22	0.80	±	0.23	2.94	±	0.85	Yes	13.60	±	0.65	50.32	±	2.39	Yes
	11/02/22	2.04	±	0.33	7.55	±	1.23	Yes	27.10	±	0.89	100.27	±	3.27	Yes
	11/09/22	0.46	±	0.20	1.71	±	0.73	No	9.18	±	0.53	33.97	±	1.97	Yes
	11/15/22	1.66	±	0.34	6.14	±	1.25	Yes	29.50	±	1.09	109.15	±	4.03	Yes
	11/22/22	1.87	±	0.31	6.92	±	1.15	Yes	28.80	±	1.00	106.56	±	3.70	Yes
	11/29/22	2.17	±	0.37	8.03	±	1.35	Yes	29.00	±	1.04	107.30	±	3.85	Yes
	12/06/22	1.13	±	0.28	4.18	±	1.05	Yes	18.50	±	0.79	68.45	±	2.92	Yes
	12/13/22	2.21	±	0.39	8.18	±	1.43	Yes	15.50	±	0.73	57.35	±	2.71	Yes
	12/20/22	2.48	±	0.37	9.18	±	1.37	Yes	56.10	±	1.39	207.57	±	5.14	Yes
INTEC (WEST SIDE)	10/05/22	1.55	±	0.30	5.74	±	1.10	Yes	21.10	±	0.96	78.07	±	3.53	Yes
	10/12/22	2.18	±	0.35	8.07	±	1.30	Yes	34.30	±	1.01	126.91	±	3.74	Yes
	10/19/22	1.12	±	0.25	4.14	±	0.93	Yes	19.70	±	0.89	72.89	±	3.31	Yes
	10/26/22	1.73	±	0.32	6.40	±	1.18	Yes	25.20	±	0.87	93.24	±	3.21	Yes
	11/02/22	2.10	±	0.35	7.77	±	1.31	Yes	24.30	±	0.87	89.91	±	3.22	Yes
	11/09/22	0.58	±	0.21	2.15	±	0.77	No	7.39	±	0.48	27.34	±	1.77	Yes
	11/15/22	1.19	±	0.29	4.40	±	1.06	Yes	25.30	±	1.08	93.61	±	4.00	Yes
	11/22/22	2.25	±	0.33	8.33	±	1.22	Yes	29.70	±	0.94	109.89	±	3.49	Yes
	11/29/22	2.87	±	0.39	10.62	±	1.45	Yes	28.60	±	0.91	105.82	±	3.37	Yes
	12/06/22	0.84	±	0.26	3.09	±	0.94	Yes	13.40	±	0.73	49.58	±	2.69	Yes
	12/13/22	0.21	±	0.20	0.78	±	0.73	No	14.30	±	0.78	52.91	±	2.87	Yes
	12/20/22	2.27	±	0.35	8.40	±	1.31	Yes	30.40	±	0.90	112.48	±	3.31	Yes
MAIN GATE	10/05/22	1.81	±	0.27	6.70	±	0.98	Yes	29.10	±	0.83	107.67	±	3.07	Yes
	10/12/22	2.56	±	0.30	9.47	±	1.11	Yes	50.80	±	1.03	187.96	±	3.81	Yes
	10/19/22	1.86	±	0.31	6.88	±	1.15	Yes	27.10	±	0.91	100.27	±	3.37	Yes
	10/26/22	3.34	±	0.41	12.36	±	1.50	Yes	26.20	±	0.80	96.94	±	2.96	Yes
	11/02/22	3.58	±	0.41	13.25	±	1.53	Yes	40.90	±	0.91	151.33	±	3.38	Yes
	11/09/22	0.81	±	0.24	2.98	±	0.88	Yes	11.40	±	0.55	42.18	±	2.02	Yes
	11/15/22	1.83	±	0.33	6.77	±	1.22	Yes	22.20	±	0.77	82.14	±	2.84	Yes
	11/22/22	9.73	±	1.05	36.00	±	3.89	Yes	114.00	±	2.40	421.80	±	8.88	Yes
	11/29/22	1.16	±	0.24	4.29	±	0.88	Yes	23.00	±	0.78	85.10	±	2.89	Yes
	12/06/22	1.38	±	0.29	5.11	±	1.08	Yes	17.40	±	0.66	64.38	±	2.46	Yes
	12/13/22	0.87	±	0.24	3.22	±	0.90	Yes	26.90	±	0.83	99.53	±	3.06	Yes
	12/20/22	0.96	±	0.24	3.56	±	0.88	Yes	19.90	±	0.66	73.63	±	2.42	Yes
MFC (NORTH)	10/05/22	1.05	±	0.28	3.89	±	1.02	Yes	21.30	±	0.81	78.81	±	3.00	Yes
	10/12/22	1.60	±	0.30	5.92	±	1.12	Yes	32.30	±	1.12	119.51	±	4.14	Yes
	10/19/22	1.29	±	0.27	4.77	±	1.00	Yes	16.80	±	0.82	62.16	±	3.05	Yes
a	10/26/22		±		0.00	±	0.00	No		±		0.00	±	0.00	No
	11/02/22	1.88	±	0.31	6.96	±	1.16	Yes	21.20	±	0.76	78.44	±	2.79	Yes
	11/09/22	0.15	±	0.13	0.55	±	0.48	No	12.00	±	0.66	44.40	±	2.42	Yes
	11/15/22	1.13	±	0.27	4.18	±	1.01	Yes	23.60	±	0.84	87.32	±	3.12	Yes
	11/22/22	1.86	±	0.32	0.00	±	0.00	No	26.50	±	0.95	0.00	±	0.00	No
	11/29/22	1.54	±	0.31	5.70	±	1.14	Yes	22.20	±	0.95	82.14	±	3.52	Yes
	12/06/22	0.61	±	0.21	2.26	±	0.76	No	12.10	±	0.61	44.77	±	2.26	Yes
	12/13/22	0.43	±	0.20	1.60	±	0.74	No	14.10	±	0.70	52.17	±	2.58	Yes
a	12/20/22		±		0.00	±	0.00	No		±		0.00	±	0.00	No
MFC (SOUTH)	10/05/22	1.33	±	0.29	4.92	±	1.08	Yes	18.50	±	0.76	68.45	±	2.82	Yes
	10/12/22	3.00	±	0.39	11.10	±	1.44	Yes	37.60	±	1.02	139.12	±	3.77	Yes
	10/19/22	1.46	±	0.29	5.40	±	1.07	Yes	19.20	±	0.78	71.04	±	2.88	Yes
	10/26/22	1.97	±	0.32	7.29	±	1.17	Yes	23.80	±	0.83	88.06	±	3.07	Yes
	11/02/22	0.62	±	0.21	2.31	±	0.77	Yes	20.40	±	0.75	75.48	±	2.76	Yes
	11/09/22	0.95	±	0.23	3.50	±	0.85	Yes	9.45	±	0.56	34.97	±	2.07	Yes
	11/15/22	1.59	±	0.33	5.88	±	1.21	Yes	24.00	±	0.88	88.80	±	3.25	Yes
	11/22/22	2.05	±	0.34	7.59	±	1.27	Yes	25.10	±	0.92	92.87	±	3.42	Yes
	11/29/22	1.87	±	0.33	0.00	±	0.00	No	26.20	±	0.96	0.00	±	0.00	No

Table C-1. Weekly gross alpha and gross beta concentrations in air.

		GROSS ALPHA							GROSS BETA						
Sampling Group and Location	Sampling Date	Result ± 1s Uncertainty ($\times 10^{-15}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-11}$ Bq/mL)			Result > 3s	Result ± 1s Uncertainty ($\times 10^{-15}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-11}$ Bq/mL)			Result > 3s
	12/06/22	1.26	±	0.29	4.66	±	1.09	Yes	12.00	±	0.58	44.40	±	2.14	Yes
	12/13/22	1.00	±	0.27	3.70	±	0.99	Yes	17.40	±	0.74	64.38	±	2.72	Yes
	12/20/22	1.45	±	0.29	5.37	±	1.08	Yes	31.70	±	0.95	117.29	±	3.53	Yes
NRF	10/05/22	1.80	±	0.33	6.66	±	1.21	Yes	20.20	±	0.89	74.74	±	3.29	Yes
	10/12/22	2.57	±	0.37	9.51	±	1.37	Yes	37.60	±	1.33	139.12	±	4.92	Yes
	10/19/22	1.01	±	0.28	3.74	±	1.03	Yes	18.80	±	0.81	69.56	±	3.00	Yes
	10/26/22	2.50	±	0.37	9.25	±	1.37	Yes	26.30	±	1.07	97.31	±	3.96	Yes
	11/02/22	1.66	±	0.30	6.14	±	1.10	Yes	30.50	±	0.95	112.85	±	3.52	Yes
	11/09/22	1.26	±	0.30	4.66	±	1.10	Yes	10.40	±	0.64	38.48	±	2.37	Yes
	11/15/22	2.28	±	0.41	8.44	±	1.50	Yes	24.10	±	0.95	89.17	±	3.52	Yes
	11/22/22	2.42	±	0.36	8.95	±	1.34	Yes	37.30	±	1.35	138.01	±	5.00	Yes
	11/29/22	2.03	±	0.33	7.51	±	1.20	Yes	28.70	±	0.90	106.19	±	3.34	Yes
	12/06/22	1.22	±	0.27	4.51	±	0.99	Yes	13.50	±	0.73	49.95	±	2.70	Yes
	12/14/22	1.04	±	0.32	3.85	±	1.19	Yes	20.20	±	1.07	74.74	±	3.96	Yes
	12/20/22	1.58	±	0.34	5.85	±	1.27	Yes	31.20	±	1.28	115.44	±	4.74	Yes
PBF	10/05/22	0.70	±	0.21	2.58	±	0.76	No	9.81	±	0.60	36.30	±	2.20	No
	10/12/22	1.49	±	0.29	5.51	±	1.05	No	22.10	±	0.95	81.77	±	3.52	No
	10/19/22	0.51	±	0.18	1.90	±	0.68	No	11.40	±	0.67	42.18	±	2.46	No
	10/26/22	0.41	±	0.19	1.50	±	0.69	No	10.90	±	0.65	40.33	±	2.40	No
	11/02/22	1.55	±	0.31	5.74	±	1.13	No	25.70	±	0.96	95.09	±	3.57	No
	11/09/22	0.76	±	0.26	2.82	±	0.97	No	9.69	±	0.59	35.85	±	2.19	No
	11/15/22	1.40	±	0.41	5.18	±	1.53	No	14.80	±	0.84	54.76	±	3.12	No
	11/22/22	1.47	±	0.27	5.44	±	1.00	No	26.20	±	0.91	96.94	±	3.36	No
	11/29/22	1.26	±	0.28	4.66	±	1.02	No	18.00	±	0.76	66.60	±	2.83	No
	12/06/22	0.28	±	0.24	1.02	±	0.87	No	11.20	±	0.59	41.44	±	2.17	No
	12/13/22	1.33	±	0.27	4.92	±	1.01	No	20.10	±	0.86	74.37	±	3.18	No
	12/20/22	0.89	±	0.25	3.29	±	0.93	No	21.80	±	0.79	80.66	±	2.94	No
RHLLW	10/05/22	1.16	±	0.26	4.29	±	0.98	Yes	19.90	±	0.76	73.63	±	2.80	Yes
	10/12/22	2.54	±	0.37	9.40	±	1.37	Yes	35.80	±	1.05	132.46	±	3.89	Yes
	10/19/22	1.01	±	0.27	3.74	±	0.99	Yes	19.30	±	0.79	71.41	±	2.94	Yes
	10/26/22	2.13	±	0.34	7.88	±	1.24	Yes	26.00	±	0.89	96.20	±	3.27	Yes
	11/02/22	2.39	±	0.39	8.84	±	1.45	Yes	24.30	±	0.85	89.91	±	3.15	Yes
	11/09/22	0.56	±	0.22	2.06	±	0.80	No	9.94	±	0.57	36.78	±	2.12	Yes
	11/15/22	1.96	±	0.36	7.25	±	1.32	Yes	24.10	±	0.90	89.17	±	3.34	Yes
	11/22/22	1.63	±	0.32	6.03	±	1.20	Yes	28.50	±	0.88	105.45	±	3.26	Yes
	11/29/22	3.90	±	0.44	14.43	±	1.62	Yes	26.20	±	0.85	96.94	±	3.13	Yes
	12/06/22	0.89	±	0.32	3.28	±	1.18	No	13.30	±	0.68	49.21	±	2.50	Yes
	12/13/22	0.70	±	0.27	2.58	±	0.99	No	17.40	±	0.70	64.38	±	2.60	Yes
	12/20/22	1.05	±	0.31	3.89	±	1.16	Yes	32.80	±	1.00	121.36	±	3.70	Yes
RWMC	10/05/22	1.83	±	0.32	6.77	±	1.20	Yes	15.60	±	0.71	57.72	±	2.63	Yes
	10/12/22	3.49	±	0.43	12.91	±	1.57	Yes	37.20	±	1.36	137.64	±	5.03	Yes
	10/19/22	2.06	±	0.37	7.62	±	1.38	Yes	17.70	±	0.80	65.49	±	2.95	Yes
	10/26/22	1.68	±	0.33	6.22	±	1.23	Yes	23.60	±	0.83	87.32	±	3.05	Yes
	11/02/22	1.77	±	0.30	6.55	±	1.11	Yes	25.80	±	0.99	95.46	±	3.66	Yes
	11/09/22	0.82	±	0.21	3.03	±	0.77	Yes	8.98	±	0.50	33.23	±	1.84	Yes
	11/15/22	2.48	±	0.37	9.18	±	1.38	Yes	31.30	±	1.12	115.81	±	4.14	Yes
	11/22/22	1.90	±	0.37	7.03	±	1.36	Yes	32.40	±	0.96	119.88	±	3.54	Yes
	11/29/22	2.45	±	0.35	9.07	±	1.31	Yes	28.10	±	0.89	103.97	±	3.31	Yes
	12/06/22	0.30	±	0.20	1.11	±	0.74	No	12.70	±	0.61	46.99	±	2.26	Yes
	12/13/22	0.83	±	0.27	3.06	±	1.00	Yes	15.60	±	0.71	57.72	±	2.62	Yes
	12/20/22	1.98	±	0.36	7.33	±	1.32	Yes	30.10	±	1.04	111.37	±	3.85	Yes
RWMC (QA)	10/05/22	1.49	±	0.31	5.51	±	1.16	Yes	18.50	±	0.77	68.45	±	2.85	Yes
	10/12/22	3.02	±	0.45	11.17	±	1.65	Yes	37.80	±	1.23	139.86	±	4.55	Yes
	10/19/22	1.34	±	0.27	4.96	±	1.01	Yes	21.20	±	0.92	78.44	±	3.39	Yes
	10/26/22	0.86	±	0.23	3.20	±	0.85	Yes	14.50	±	0.69	53.65	±	2.57	Yes
	11/02/22	2.06	±	0.33	7.62	±	1.22	Yes	27.60	±	0.91	102.12	±	3.36	Yes
	11/09/22	0.86	±	0.24	3.19	±	0.90	Yes	9.29	±	0.54	34.37	±	1.99	Yes
	11/15/22	1.98	±	0.36	7.33	±	1.32	Yes	28.20	±	1.05	104.34	±	3.89	Yes

Table C-1. Weekly gross alpha and gross beta concentrations in air.

		GROSS ALPHA							GROSS BETA						
Sampling Group and Location	Sampling Date	Result ± 1s Uncertainty ($\times 10^{-15}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-11}$ Bq/mL)			Result > 3s	Result ± 1s Uncertainty ($\times 10^{-15}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-11}$ Bq/mL)			Result > 3s
	11/22/22	1.74	±	0.29	6.44	±	1.09	Yes	28.00	±	1.01	103.60	±	3.74	Yes
	11/29/22	1.62	±	0.31	5.99	±	1.15	Yes	22.40	±	0.85	82.88	±	3.16	Yes
	12/06/22	1.17	±	0.25	4.33	±	0.93	Yes	18.80	±	0.78	69.56	±	2.88	Yes
	12/13/22	0.72	±	0.22	2.67	±	0.81	Yes	17.30	±	0.71	64.01	±	2.61	Yes
	12/20/22	2.73	±	0.39	10.10	±	1.44	Yes	55.70	±	1.82	206.09	±	6.73	Yes
RWMC (SOUTH)	10/05/22	1.57	±	0.32	5.81	±	1.20	Yes	17.60	±	0.74	65.12	±	2.75	Yes
	10/12/22	2.92	±	0.40	10.80	±	1.49	Yes	33.70	±	1.05	124.69	±	3.89	Yes
	10/19/22	1.21	±	0.42	4.48	±	1.55	No	14.40	±	0.88	53.28	±	3.27	Yes
	10/26/22	1.52	±	0.29	5.62	±	1.08	Yes	26.00	±	1.08	96.20	±	4.00	Yes
	11/02/22	1.78	±	0.30	6.59	±	1.12	Yes	23.40	±	0.81	86.58	±	2.99	Yes
	11/09/22	0.40	±	0.17	1.48	±	0.61	No	10.70	±	0.55	39.59	±	2.05	Yes
	11/15/22	1.38	±	0.29	5.11	±	1.08	Yes	28.40	±	0.94	105.08	±	3.46	Yes
	11/22/22	2.56	±	0.35	9.47	±	1.28	Yes	31.90	±	0.95	118.03	±	3.52	Yes
	11/29/22	1.75	±	0.30	6.48	±	1.10	Yes	29.20	±	0.94	108.04	±	3.48	Yes
	12/06/22	1.11	±	0.28	4.11	±	1.02	Yes	16.10	±	0.74	59.57	±	2.75	Yes
	12/13/22	1.17	±	0.28	4.33	±	1.04	Yes	21.00	±	0.86	77.70	±	3.18	Yes
	12/20/22	1.60	±	0.31	5.92	±	1.16	Yes	32.20	±	0.97	119.14	±	3.59	Yes
SMC	10/05/22	1.68	±	0.36	6.22	±	1.32	Yes	18.80	±	0.94	69.56	±	3.46	Yes
	10/12/22	3.25	±	0.62	12.03	±	2.28	Yes	42.00	±	1.58	155.40	±	5.85	Yes
	10/19/22	1.13	±	0.28	4.18	±	1.02	Yes	16.90	±	0.76	62.53	±	2.82	Yes
	10/26/22	1.93	±	0.33	7.14	±	1.21	Yes	24.80	±	0.91	91.76	±	3.37	Yes
	11/02/22	1.82	±	0.34	6.73	±	1.24	Yes	26.00	±	0.88	96.20	±	3.24	Yes
	11/09/22	1.03	±	0.26	3.81	±	0.95	Yes	10.50	±	0.56	38.85	±	2.08	Yes
	11/15/22	1.33	±	0.31	4.92	±	1.15	Yes	22.80	±	0.99	84.36	±	3.67	Yes
	11/22/22	2.71	±	0.38	10.03	±	1.41	Yes	28.10	±	0.91	103.97	±	3.35	Yes
	11/29/22	1.90	±	0.36	7.03	±	1.32	Yes	32.00	±	0.97	118.40	±	3.58	Yes
	12/06/22	0.80	±	0.26	2.95	±	0.97	Yes	17.30	±	0.71	64.01	±	2.61	Yes
	12/13/22	0.74	±	0.24	2.74	±	0.90	Yes	19.80	±	0.78	73.26	±	2.89	Yes
	12/20/22	1.52	±	0.32	5.62	±	1.17	Yes	26.50	±	0.90	98.05	±	3.32	Yes
VAN BUREN	10/05/22	1.20	±	0.27	4.44	±	1.00	Yes	20.00	±	0.86	74.00	±	3.18	Yes
	10/12/22	3.13	±	0.43	11.58	±	1.60	Yes	38.30	±	1.16	141.71	±	4.29	Yes
	10/19/22	1.74	±	0.31	6.44	±	1.16	Yes	18.20	±	0.83	67.34	±	3.07	Yes
	10/26/22	0.85	±	0.22	3.14	±	0.81	Yes	17.70	±	0.71	65.49	±	2.63	Yes
	11/02/22	1.46	±	0.28	5.40	±	1.03	Yes	24.90	±	0.94	92.13	±	3.49	Yes
	11/09/22	0.77	±	0.22	2.86	±	0.82	Yes	9.20	±	0.59	34.04	±	2.17	Yes
	11/15/22	1.71	±	0.32	6.33	±	1.18	Yes	26.90	±	1.08	99.53	±	4.00	Yes
	11/22/22	1.60	±	0.27	5.92	±	1.00	Yes	27.70	±	0.89	102.49	±	3.30	Yes
	11/29/22	1.74	±	0.34	6.44	±	1.25	Yes	27.40	±	0.89	101.38	±	3.28	Yes
	12/06/22	0.66	±	0.25	2.42	±	0.93	No	17.80	±	0.75	65.86	±	2.78	Yes
	12/13/22	0.73	±	0.27	2.72	±	1.00	No	13.70	±	0.63	50.69	±	2.33	Yes
	12/20/22	1.17	±	0.33	4.33	±	1.21	Yes	42.00	±	1.11	155.40	±	4.11	Yes
VAN BUREN (QA)	10/05/22	1.47	±	0.30	5.44	±	1.10	Yes	22.60	±	0.98	83.62	±	3.63	Yes
	10/12/22	2.80	±	0.38	10.36	±	1.42	Yes	37.90	±	1.09	140.23	±	4.03	Yes
	10/19/22	0.80	±	0.23	2.96	±	0.84	Yes	17.90	±	0.79	66.23	±	2.92	Yes
	10/26/22	0.69	±	0.21	2.55	±	0.78	Yes	17.60	±	0.79	65.12	±	2.92	Yes
	11/02/22	1.60	±	0.32	5.92	±	1.17	Yes	23.80	±	0.95	88.06	±	3.51	Yes
	11/09/22	0.35	±	0.19	1.28	±	0.71	No	8.35	±	0.50	30.90	±	1.84	Yes
	11/15/22	1.67	±	0.34	6.18	±	1.26	Yes	28.60	±	1.06	105.82	±	3.92	Yes
	11/22/22	2.78	±	0.42	10.29	±	1.55	Yes	35.10	±	1.15	129.87	±	4.26	Yes
	11/29/22	2.12	±	0.37	7.84	±	1.36	Yes	28.20	±	0.95	104.34	±	3.52	Yes
	12/06/22	1.47	±	0.29	5.44	±	1.08	Yes	21.60	±	0.83	79.92	±	3.08	Yes
	12/13/22	0.42	±	0.19	1.54	±	0.70	No	14.10	±	0.66	52.17	±	2.42	Yes
	12/20/22	1.61	±	0.33	5.96	±	1.21	Yes	48.80	±	1.39	180.56	±	5.14	Yes

a. Invalid samples identified in red.

Table C-2. Weekly iodine-131 activity in air.

Sampling Group and Location		Sampling Date	Result ± 1s Uncertainty ($\times 10^{-15}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-11}$ Bq/mL)			Result > 3s
BOUNDARY									
ARCO		10/05/22	1.35	±	1.39	5.00	±	5.14	No
		10/12/22	2.69	±	2.65	9.95	±	9.81	No
		10/19/22	0.76	±	2.25	2.79	±	8.33	No
		10/26/22	-0.49	±	1.34	-1.81	±	4.96	No
		11/02/22	0.96	±	0.84	3.55	±	3.10	No
		11/09/22	1.48	±	1.53	5.48	±	5.66	No
		11/15/22	-1.13	±	1.26	-4.18	±	4.66	No
		11/22/22	-0.01	±	0.99	-0.02	±	3.64	No
		11/29/22	0.15	±	1.10	0.57	±	4.07	No
		12/06/22	-2.89	±	1.98	-10.69	±	7.33	No
		12/13/22	0.38	±	1.26	1.40	±	4.66	No
		12/20/22	2.50	±	1.83	9.25	±	6.77	No
ATOMIC CITY		10/05/22	-0.58	±	1.36	-2.14	±	5.03	No
		10/12/22	0.87	±	1.58	3.21	±	5.85	No
		10/19/22	-0.86	±	1.49	-3.19	±	5.51	No
		10/26/22	-3.19	±	1.79	-11.80	±	6.62	No
		11/02/22	-0.95	±	1.62	-3.50	±	5.99	No
		11/09/22	-0.86	±	1.70	-3.17	±	6.29	No
		11/15/22	-1.52	±	1.25	-5.62	±	4.63	No
		11/22/22	-1.01	±	1.38	-3.74	±	5.11	No
		11/29/22	-2.01	±	1.77	-7.44	±	6.55	No
		12/06/22	-1.67	±	1.92	-6.18	±	7.10	No
		12/13/22	0.91	±	1.26	3.37	±	4.66	No
		12/20/22	-1.33	±	1.81	-4.92	±	6.70	No
BLUE DOME		10/05/22	-0.68	±	1.59	-2.51	±	5.88	No
		10/12/22	2.58	±	2.55	9.55	±	9.44	No
		10/19/22	0.86	±	2.56	3.17	±	9.47	No
		10/26/22	-0.50	±	1.38	-1.86	±	5.11	No
		11/02/22	0.97	±	0.84	3.57	±	3.12	No
		11/09/22	1.45	±	1.49	5.37	±	5.51	No
		11/15/22	-1.07	±	1.19	-3.96	±	4.40	No
		11/22/22	-0.01	±	0.94	-0.02	±	3.47	No
	a	11/29/22		±			±		No
		12/06/22	-2.90	±	1.98	-10.73	±	7.33	No
		12/14/22	0.34	±	1.14	1.26	±	4.22	No
		12/20/22	2.83	±	2.07	10.47	±	7.66	No
FAA TOWER		10/05/22	-0.58	±	1.35	-2.13	±	5.00	No
		10/12/22	0.86	±	1.55	3.16	±	5.74	No
		10/19/22	-0.75	±	1.30	-2.78	±	4.81	No
		10/26/22	-3.15	±	1.76	-11.66	±	6.51	No
		11/02/22	-0.97	±	1.65	-3.57	±	6.11	No
		11/09/22	-0.88	±	1.74	-3.24	±	6.44	No
		11/15/22	-1.41	±	1.16	-5.22	±	4.29	No
		11/22/22	-1.04	±	1.41	-3.85	±	5.22	No
		11/29/22	-1.98	±	1.75	-7.33	±	6.48	No
		12/06/22	-1.47	±	1.70	-5.44	±	6.29	No
		12/13/22	0.87	±	1.20	3.22	±	4.44	No
		12/20/22	-1.34	±	1.82	-4.96	±	6.73	No
HOWE		10/05/22	-1.13	±	2.64	-4.18	±	9.77	No

Table C-2. Weekly iodine-131 activity in air.

Sampling Group and Location		Sampling Date	Result ± 1s Uncertainty ($\times 10^{-15}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-11}$ Bq/mL)			Result > 3s
	a	10/12/22		±			±		No
		10/19/22	0.79	±	2.36	2.93	±	8.73	No
		10/26/22	-0.53	±	1.46	-1.97	±	5.40	No
		11/02/22	1.02	±	0.89	3.77	±	3.30	No
		11/09/22	1.57	±	1.62	5.81	±	5.99	No
		11/15/22	-1.13	±	1.25	-4.18	±	4.63	No
		11/22/22	-0.01	±	0.95	-0.02	±	3.51	No
		11/29/22	0.15	±	1.10	0.57	±	4.07	No
		12/06/22	-2.83	±	1.94	-10.47	±	7.18	No
		12/13/22	0.37	±	1.25	1.38	±	4.63	No
		12/20/22	2.44	±	1.79	9.03	±	6.62	No
MONTEVIEW		10/05/22	1.38	±	1.43	5.11	±	5.29	No
		10/12/22	2.61	±	2.58	9.66	±	9.55	No
		10/19/22	0.74	±	2.20	2.72	±	8.14	No
		10/26/22	-0.52	±	1.41	-1.91	±	5.22	No
		11/02/22	1.00	±	0.87	3.70	±	3.22	No
		11/09/22	1.46	±	1.51	5.40	±	5.59	No
		11/15/22	-1.06	±	1.18	-3.92	±	4.37	No
		11/22/22	-0.01	±	1.03	-0.03	±	3.81	No
		11/29/22	0.16	±	1.11	0.58	±	4.11	No
		12/06/22	-2.78	±	1.91	-10.29	±	7.07	No
		12/13/22	0.36	±	1.20	1.33	±	4.44	No
		12/20/22	2.46	±	1.81	9.10	±	6.70	No
MUD LAKE		10/05/22	1.26	±	1.30	4.66	±	4.81	No
		10/12/22	0.88	±	1.60	3.25	±	5.92	No
		10/19/22	-0.83	±	1.44	-3.06	±	5.33	No
		10/26/22	-3.19	±	1.78	-11.80	±	6.59	No
		11/02/22	-0.95	±	1.62	-3.51	±	5.99	No
		11/09/22	-0.86	±	1.71	-3.20	±	6.33	No
		11/15/22	-1.44	±	1.18	-5.33	±	4.37	No
		11/22/22	-1.02	±	1.39	-3.77	±	5.14	No
		11/29/22	-2.02	±	1.78	-7.47	±	6.59	No
		12/06/22	-1.49	±	1.72	-5.51	±	6.36	No
		12/13/22	0.92	±	1.26	3.39	±	4.66	No
		12/20/22	-1.31	±	1.78	-4.85	±	6.59	No
TERRETON		10/05/22	36.44	±	150.45	134.82	±	556.67	No
		10/12/22	-104.64	±	161.41	-387.17	±	597.22	No
		10/19/22	179.42	±	120.23	663.85	±	444.85	No
		10/26/22	-133.47	±	155.69	-493.84	±	576.05	No
		11/02/22	14.44	±	143.54	53.44	±	531.10	No
		11/09/22	-10.85	±	244.76	-40.13	±	905.61	No
		11/15/22	39.83	±	133.43	147.37	±	493.69	No
		11/22/22	-68.97	±	134.46	-255.19	±	497.50	No
		11/29/22	-146.66	±	139.22	-542.64	±	515.11	No
		12/06/22	-71.04	±	111.42	-262.84	±	412.25	No
		12/13/22	48.52	±	144.83	179.52	±	535.87	No
		12/20/22	-44.03	±	111.22	-162.90	±	411.51	No
OFFSITE									
BLACKFOOT		10/05/22	93.31	±	133.34	345.24	±	493.36	No
		10/12/22	-103.45	±	118.45	-382.77	±	438.27	No

Table C-2. Weekly iodine-131 activity in air.

Sampling Group and Location		Sampling Date	Result ± 1s Uncertainty ($\times 10^{-15}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-11}$ Bq/mL)			Result > 3s
		10/19/22	107.64	±	118.03	398.27	±	436.71	No
		10/26/22	51.06	±	152.28	188.94	±	563.44	No
		11/02/22	53.12	±	146.28	196.56	±	541.24	No
		11/09/22	-14.00	±	114.48	-51.80	±	423.58	No
	a	11/15/22		±			±		No
		11/22/22	75.16	±	179.21	278.08	±	663.08	No
		11/29/22	4.84	±	100.71	17.93	±	372.63	No
		12/06/22	56.95	±	129.66	210.70	±	479.74	No
		12/13/22	73.30	±	119.25	271.22	±	441.23	No
		12/20/22	-88.26	±	134.74	-326.57	±	498.54	No
CRATERS OF THE MOON		10/05/22	-2.48	±	111.72	-9.18	±	413.36	No
		10/12/22	86.53	±	116.13	320.15	±	429.68	No
		10/19/22	56.59	±	139.86	209.40	±	517.48	No
		10/26/22	-72.39	±	150.53	-267.83	±	556.96	No
		11/02/22		±	148.58		±	549.75	No
		11/09/22	-83.17	±	119.46	-307.74	±	442.00	No
		11/15/22	20.09	±	159.08	74.33	±	588.60	No
		11/22/22	3.34	±	106.79	12.34	±	395.12	No
		11/29/22	-11.43	±	94.21	-42.29	±	348.56	No
		12/06/22	-6.79	±	117.93	-25.13	±	436.34	No
		12/13/22	0.22	±	113.08	0.81	±	418.40	No
		12/20/22	1.78	±	117.44	6.60	±	434.53	No
DUBOIS		10/05/22	2.75	±	2.83	10.18	±	10.47	No
		10/12/22	2.51	±	2.47	9.29	±	9.14	No
		10/19/22	0.83	±	2.47	3.06	±	9.14	No
		10/26/22	-0.46	±	1.25	-1.69	±	4.63	No
		11/02/22	0.89	±	0.77	3.28	±	2.86	No
		11/09/22	1.48	±	1.52	5.48	±	5.62	No
		11/15/22	-1.10	±	1.22	-4.07	±	4.51	No
		11/22/22	-0.01	±	0.98	-0.02	±	3.63	No
		11/29/22	0.16	±	1.12	0.58	±	4.14	No
		12/06/22	-2.88	±	1.97	-10.66	±	7.29	No
		12/13/22	0.38	±	1.29	1.42	±	4.77	No
		12/20/22	2.60	±	1.91	9.62	±	7.07	No
DUBOIS (QA)		10/05/22	-0.55	±	1.30	-2.05	±	4.81	No
		10/12/22	2.51	±	2.47	9.29	±	9.14	No
		10/19/22	0.63	±	1.88	2.33	±	6.96	No
		10/26/22	-0.50	±	1.36	-1.84	±	5.03	No
		11/02/22	0.94	±	0.82	3.48	±	3.03	No
		11/09/22	1.45	±	1.50	5.37	±	5.55	No
		11/15/22	-1.09	±	1.21	-4.03	±	4.48	No
		11/22/22	-0.01	±	0.97	-0.02	±	3.60	No
		11/29/22	0.16	±	1.13	0.59	±	4.18	No
		12/06/22	-2.83	±	1.93	-10.47	±	7.14	No
		12/13/22	0.39	±	1.29	1.42	±	4.77	No
		12/20/22	2.51	±	1.84	9.29	±	6.81	No
IDAHO FALLS		10/05/22	-88.01	±	118.48	-325.63	±	438.38	No
		10/12/22	-103.78	±	114.80	-383.99	±	424.76	No
		10/19/22	6.09	±	136.42	22.51	±	504.75	No
		10/26/22	-115.77	±	139.95	-428.35	±	517.82	No

Table C-2. Weekly iodine-131 activity in air.

Sampling Group and Location	Sampling Date	Result ± 1s Uncertainty ($\times 10^{-15}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-11}$ Bq/mL)			Result > 3s
	11/02/22	-8.36	±	126.63	-30.94	±	468.53	No
	11/09/22		±	132.53		±	490.36	No
	11/15/22	-39.78	±	138.31	-147.18	±	511.75	No
	11/22/22	90.36	±	102.31	334.34	±	378.55	No
	11/29/22	-15.41	±	127.95	-57.01	±	473.42	No
	12/06/22	5.03	±	128.44	18.61	±	475.23	No
	12/13/22	125.91	±	124.92	465.87	±	462.20	No
	12/20/22	-128.17	±	131.58	-474.23	±	486.85	No
IRC	10/05/22	-21.40	±	131.08	-79.17	±	485.00	No
	10/12/22	-38.24	±	114.85	-141.49	±	424.95	No
	10/19/22	12.53	±	137.74	46.35	±	509.64	No
	10/26/22	-51.00	±	121.20	-188.69	±	448.44	No
	11/02/22	-101.25	±	144.75	-374.63	±	535.58	No
	11/09/22	-70.12	±	116.85	-259.45	±	432.35	No
	11/15/22	-5.99	±	152.56	-22.16	±	564.47	No
	11/22/22	74.47	±	135.75	275.55	±	502.28	No
	11/29/22	148.66	±	509.10	550.04	±	1883.67	No
	12/06/22	-26.47	±	125.72	-97.92	±	465.16	No
	12/13/22	142.33	±	118.02	526.62	±	436.67	No
	12/20/22	7.80	±	134.05	28.87	±	495.99	No
IRC (NORTH)	10/05/22	-99.62	±	130.94	-368.58	±	484.48	No
	10/12/22	-29.16	±	126.69	-107.89	±	468.75	No
	10/19/22	81.61	±	125.30	301.96	±	463.61	No
	10/26/22	16.78	±	124.36	62.07	±	460.13	No
	11/02/22	34.73	±	143.09	128.52	±	529.43	No
	11/09/22	57.20	±	112.27	211.62	±	415.40	No
	11/15/22	-139.49	±	168.33	-516.11	±	622.82	No
	11/22/22	55.68	±	101.17	206.01	±	374.33	No
	11/29/22	-132.89	±	135.57	-491.69	±	501.61	No
	12/06/22	36.21	±	95.56	133.98	±	353.56	No
	12/13/22	-174.39	±	149.22	-645.24	±	552.11	No
	12/20/22	33.99	±	146.31	125.75	±	541.35	No
JACKSON, WY	10/05/22	1.28	±	1.32	4.74	±	4.88	No
	10/12/22	0.95	±	1.72	3.50	±	6.36	No
	10/19/22	-0.78	±	1.35	-2.89	±	5.00	No
	10/26/22	-3.39	±	1.90	-12.54	±	7.03	No
	11/02/22	-1.01	±	1.72	-3.74	±	6.36	No
	11/09/22	-0.88	±	1.74	-3.24	±	6.44	No
	11/22/22	-1.22	±	1.66	-4.51	±	6.14	No
	11/22/22	-1.52	±	1.25	-5.62	±	4.63	No
	11/29/22	-2.30	±	2.03	-8.51	±	7.51	No
	12/06/22	-1.65	±	1.91	-6.11	±	7.07	No
	12/13/22	0.96	±	1.32	3.54	±	4.88	No
	12/20/22	-1.21	±	1.64	-4.48	±	6.07	No
SUGAR CITY	10/05/22	-108.25	±	148.51	-400.53	±	549.49	No
	10/12/22	1.30	±	128.47	4.83	±	475.34	No
	10/19/22	-38.61	±	137.66	-142.85	±	509.34	No
	10/26/22	-6.85	±	113.64	-25.36	±	420.47	No
	11/02/22	-87.13	±	136.19	-322.38	±	503.90	No
	11/09/22	-18.05	±	120.02	-66.79	±	444.07	No

Table C-2. Weekly iodine-131 activity in air.

Sampling Group and Location		Sampling Date	Result ± 1s Uncertainty ($\times 10^{-15}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-11}$ Bq/mL)			Result > 3s
		11/15/22	86.94	±	145.22	321.67	±	537.31	No
		11/22/22	-160.43	±	130.45	-593.59	±	482.67	No
		11/29/22	-115.33	±	125.39	-426.72	±	463.94	No
		12/06/22	-27.75	±	137.98	-102.69	±	510.53	No
		12/13/22	-7.44	±	133.86	-27.54	±	495.28	No
		12/20/22	43.88	±	128.15	162.34	±	474.16	No
ONSITE									
ATR COMPLEX		10/05/22	-127.34	±	137.72	-471.16	±	509.56	No
		10/12/22	-184.16	±	153.44	-681.39	±	567.73	No
		10/19/22	-95.89	±	160.36	-354.77	±	593.33	No
		10/26/22	-136.22	±	152.94	-504.01	±	565.88	No
		11/02/22	-105.03	±	115.64	-388.61	±	427.87	No
		11/09/22	-130.33	±	143.27	-482.22	±	530.10	No
		11/15/22	17.47	±	137.95	64.65	±	510.42	No
		11/22/22	-108.62	±	117.20	-401.89	±	433.64	No
		11/29/22	-16.58	±	133.68	-61.34	±	494.62	No
		12/06/22	8.92	±	92.65	32.99	±	342.81	No
		12/13/22	13.04	±	120.08	48.26	±	444.30	No
		12/20/22	205.51	±	136.10	760.39	±	503.57	No
CFA	a	10/05/22		±			±		No
		10/12/22	4.60	±	175.60	17.01	±	649.72	No
		10/19/22	-8.95	±	205.76	-33.10	±	761.31	No
		10/26/22	-108.70	±	138.06	-402.19	±	510.82	No
		11/02/22	-73.24	±	112.49	-270.98	±	416.21	No
		11/09/22	-71.03	±	140.17	-262.82	±	518.63	No
		11/15/22	-62.94	±	147.20	-232.89	±	544.64	No
		11/22/22	92.27	±	135.39	341.40	±	500.94	No
		11/29/22	24.47	±	124.73	90.55	±	461.50	No
		12/06/22	-66.09	±	135.17	-244.51	±	500.13	No
		12/13/22	148.36	±	125.43	548.93	±	464.09	No
		12/20/22	-36.56	±	143.56	-135.29	±	531.17	No
EBR-I		10/05/22	-56.27	±	162.26	-208.21	±	600.36	No
		10/12/22	-89.80	±	161.01	-332.27	±	595.74	No
		10/19/22	-129.14	±	177.40	-477.82	±	656.38	No
		10/26/22	-124.27	±	130.15	-459.80	±	481.56	No
		11/02/22	-3.61	±	145.49	-13.35	±	538.31	No
		11/09/22	-7.72	±	128.10	-28.58	±	473.97	No
		11/15/22	240.93	±	134.30	891.44	±	496.91	No
		11/22/22	37.09	±	144.15	137.23	±	533.36	No
		11/29/22	20.40	±	145.87	75.46	±	539.72	No
		12/06/22	13.78	±	118.58	50.99	±	438.75	No
		12/13/22	-6.39	±	153.81	-23.65	±	569.10	No
		12/20/22	-45.81	±	129.94	-169.49	±	480.78	No
EFS	a	10/05/22		±			±		No
	a	10/12/22		±			±		No
		10/19/22	-162.35	±	163.03	-600.70	±	603.21	No
		10/26/22	36.09	±	171.23	133.54	±	633.55	No
		11/02/22	-5.83	±	140.85	-21.58	±	521.15	No
		11/09/22	-86.75	±	140.69	-320.96	±	520.55	No
		11/15/22	17.85	±	124.48	66.03	±	460.58	No

Table C-2. Weekly iodine-131 activity in air.

Sampling Group and Location	Sampling Date	Result ± 1s Uncertainty ($\times 10^{-15}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-11}$ Bq/mL)			Result > 3s
	11/22/22	-148.08	±	126.36	-547.90	±	467.53	No
	11/29/22	-20.91	±	113.42	-77.35	±	419.65	No
	12/06/22	-61.94	±	124.93	-229.19	±	462.24	No
	12/13/22	1.65	±	100.96	6.10	±	373.55	No
	12/20/22	-50.13	±	140.76	-185.46	±	520.81	No
GATE 4	10/05/22	116.87	±	136.36	432.42	±	504.53	No
	10/12/22	-89.90	±	151.86	-332.62	±	561.88	No
	10/19/22	-163.23	±	116.32	-603.95	±	430.38	No
	10/26/22	42.16	±	144.36	155.99	±	534.13	No
	11/02/22	-168.33	±	136.08	-622.82	±	503.50	No
	11/09/22	-83.84	±	124.46	-310.22	±	460.50	No
	11/15/22	133.40	±	157.12	493.58	±	581.34	No
	11/22/22	-6.56	±	105.84	-24.29	±	391.61	No
	11/29/22	-227.19	±	140.60	-840.60	±	520.22	No
	12/06/22	98.62	±	123.95	364.88	±	458.62	No
	12/13/22	-15.40	±	134.79	-56.98	±	498.72	No
	12/20/22	339.91	±	200.08	1257.67	±	740.30	No
HIGHWAY 26 REST AREA	10/05/22	-3.41	±	147.96	-12.61	±	547.45	No
	10/12/22	-165.09	±	143.03	-610.83	±	529.21	No
	10/19/22	-32.28	±	157.44	-119.45	±	582.53	No
	10/26/22	-82.01	±	139.16	-303.42	±	514.89	No
	11/02/22	-170.06	±	145.61	-629.22	±	538.76	No
	11/09/22	115.82	±	129.32	428.53	±	478.48	No
	11/15/22	3.16	±	155.15	11.70	±	574.06	No
	11/22/22	-79.76	±	130.37	-295.10	±	482.37	No
	11/29/22	-1.30	±	112.59	-4.81	±	416.58	No
	12/06/22	17.55	±	124.11	64.93	±	459.21	No
	12/13/22	-4.66	±	118.04	-17.23	±	436.75	No
	12/20/22	-2.70	±	93.33	-10.00	±	345.34	No
INTEC (NE CORNER)	10/05/22	-7.87	±	121.18	-29.11	±	448.37	No
	10/12/22	-27.42	±	129.76	-101.45	±	480.11	No
	10/19/22	2.38	±	134.38	8.80	±	497.21	No
	10/26/22	-205.74	±	147.40	-761.24	±	545.38	No
	11/02/22	3.69	±	116.19	13.64	±	429.90	No
	11/09/22	-10.03	±	122.52	-37.11	±	453.32	No
	11/15/22	-70.15	±	135.14	-259.57	±	500.02	No
	11/22/22	40.60	±	124.57	150.23	±	460.91	No
	11/29/22	-48.10	±	120.53	-177.96	±	445.96	No
	12/06/22	49.98	±	134.39	184.93	±	497.24	No
	12/13/22	-5.71	±	132.96	-21.12	±	491.95	No
	12/20/22	-216.12	±	139.02	-799.64	±	514.37	No
INTEC (WEST SIDE)	10/05/22	-35.53	±	130.51	-131.47	±	482.89	No
	10/12/22	-128.04	±	130.85	-473.75	±	484.15	No
	10/19/22	-169.32	±	147.90	-626.48	±	547.23	No
	10/26/22	-106.14	±	145.45	-392.72	±	538.17	No
	11/02/22	-2.95	±	139.13	-10.92	±	514.78	No
	11/09/22	-202.78	±	138.29	-750.29	±	511.67	No
	11/15/22	8.38	±	101.69	30.99	±	376.25	No
	11/22/22	79.87	±	145.40	295.53	±	537.98	No
	11/29/22	151.43	±	102.02	560.29	±	377.47	No

Table C-2. Weekly iodine-131 activity in air.

Sampling Group and Location		Sampling Date	Result ± 1s Uncertainty ($\times 10^{-15}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-11}$ Bq/mL)			Result > 3s
		12/06/22	51.31	±	126.10	189.83	±	466.57	No
		12/13/22	-2.74	±	143.49	-10.14	±	530.91	No
		12/20/22	-7.92	±	130.74	-29.30	±	483.74	No
INTEC (QA)		10/05/22	-48.20	±	128.86	-178.34	±	476.78	No
		10/12/22	44.11	±	129.05	163.21	±	477.49	No
		10/19/22	-233.31	±	149.45	-863.25	±	552.97	No
		10/26/22	31.95	±	125.01	118.22	±	462.54	No
		11/02/22	1.38	±	109.92	5.09	±	406.70	No
		11/09/22	-77.70	±	134.25	-287.50	±	496.73	No
		11/15/22	213.98	±	115.18	791.73	±	426.17	No
		11/22/22		±	121.49		±	449.51	No
		11/29/22	-44.96	±	137.48	-166.36	±	508.68	No
		12/06/22	-167.98	±	138.59	-621.53	±	512.78	No
		12/13/22	48.41	±	118.09	179.12	±	436.93	No
		12/20/22	10.91	±	119.59	40.37	±	442.48	No
MAIN GATE		10/05/22	-0.60	±	1.41	-2.23	±	5.22	No
		10/12/22	0.88	±	1.60	3.25	±	5.92	No
		10/19/22	-0.86	±	1.49	-3.18	±	5.51	No
		10/26/22	-3.26	±	1.82	-12.06	±	6.73	No
		11/02/22	-0.94	±	1.60	-3.46	±	5.92	No
		11/09/22	-0.83	±	1.63	-3.05	±	6.03	No
		11/15/22	-1.45	±	1.19	-5.37	±	4.40	No
		11/22/22	-2.64	±	3.61	-9.77	±	13.36	No
		11/29/22	-2.04	±	1.80	-7.55	±	6.66	No
		12/06/22	-1.62	±	1.87	-5.99	±	6.92	No
		12/13/22	0.90	±	1.24	3.34	±	4.59	No
		12/20/22	-1.05	±	1.43	-3.89	±	5.29	No
MFC (NORTH)		10/05/22	26.19	±	130.14	96.91	±	481.52	No
		10/12/22	-87.12	±	138.58	-322.33	±	512.75	No
		10/19/22	-29.48	±	142.57	-109.07	±	527.51	No
	a	10/26/22		±			±		No
		11/02/22	7.31	±	118.01	27.06	±	436.64	No
		11/09/22	-3.22	±	140.09	-11.90	±	518.33	No
		11/15/22	-47.98	±	150.38	-177.51	±	556.41	No
		11/22/22	-0.11	±	132.41	-0.42	±	489.92	No
		11/29/22	-56.60	±	120.95	-209.41	±	447.52	No
		12/06/22	-165.33	±	137.52	-611.72	±	508.82	No
		12/13/22	-88.11	±	142.23	-326.00	±	526.25	No
	a	12/20/22		±			±		No
MFC (SOUTH)		10/05/22	-28.76	±	135.21	-106.40	±	500.28	No
		10/12/22	41.68	±	113.67	154.21	±	420.58	No
		10/19/22	160.76	±	147.94	594.81	±	547.38	No
		10/26/22	-110.04	±	131.63	-407.15	±	487.03	No
		11/02/22	-62.17	±	134.72	-230.01	±	498.46	No
		11/09/22	-99.18	±	142.57	-366.96	±	527.51	No
		11/15/22	-16.09	±	137.96	-59.52	±	510.45	No
		11/22/22	-185.11	±	127.86	-684.91	±	473.08	No
		11/29/22	-121.68	±	129.35	-450.22	±	478.60	No
		12/06/22	86.19	±	126.99	318.89	±	469.86	No
		12/13/22	86.03	±	145.45	318.33	±	538.17	No

Table C-2. Weekly iodine-131 activity in air.

Sampling Group and Location	Sampling Date	Result ± 1s Uncertainty ($\times 10^{-15}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-11}$ Bq/mL)			Result > 3s
	12/20/22	55.79	±	148.40	206.42	±	549.08	No
NRF	10/05/22	11.86	±	122.99	43.86	±	455.06	No
	10/12/22	-65.22	±	146.39	-241.31	±	541.64	No
	10/19/22	28.27	±	156.49	104.61	±	579.01	No
	10/26/22	-40.08	±	132.24	-148.29	±	489.29	No
	11/02/22	58.08	±	117.46	214.90	±	434.60	No
	11/09/22	-56.12	±	192.48	-207.66	±	712.18	No
	11/15/22	-15.08	±	145.83	-55.81	±	539.57	No
	11/22/22	34.52	±	98.56	127.71	±	364.66	No
	11/29/22	-51.63	±	142.13	-191.02	±	525.88	No
	12/06/22	-76.34	±	133.87	-282.46	±	495.32	No
	12/14/22	-266.14	±	170.34	-984.72	±	630.26	No
	12/20/22	16.26	±	171.24	60.18	±	633.59	No
PBF	10/05/22	-111.00	±	128.73	-410.70	±	476.30	No
	10/12/22	-45.91	±	146.53	-169.87	±	542.16	No
	10/19/22	17.27	±	122.99	63.89	±	455.06	No
	10/26/22	20.98	±	157.51	77.63	±	582.79	No
	11/02/22	52.11	±	144.76	192.79	±	535.61	No
	11/09/22	-22.79	±	121.10	-84.33	±	448.07	No
	11/15/22	23.47	±	208.39	86.83	±	771.04	No
	11/22/22	5.10	±	119.44	18.86	±	441.93	No
	11/29/22	-15.92	±	125.60	-58.89	±	464.72	No
	12/06/22	3.14	±	124.36	11.60	±	460.13	No
	12/13/22	17.65	±	147.51	65.30	±	545.79	No
	12/20/22	-27.31	±	122.94	-101.03	±	454.88	No
RHLLW	10/05/22	3.78	±	119.54	14.00	±	442.30	No
	10/12/22	113.60	±	146.66	420.32	±	542.64	No
	10/19/22	-58.89	±	131.49	-217.89	±	486.51	No
	10/26/22	29.06	±	143.22	107.52	±	529.91	No
	11/02/22	-140.81	±	147.89	-521.00	±	547.19	No
	11/09/22	-49.48	±	139.12	-183.07	±	514.74	No
	11/15/22	140.53	±	123.56	519.96	±	457.17	No
	11/22/22	-8.58	±	107.51	-31.74	±	397.79	No
	11/29/22	62.90	±	127.62	232.72	±	472.19	No
	12/06/22	101.90	±	126.47	377.03	±	467.94	No
	12/13/22	-6.09	±	135.50	-22.54	±	501.35	No
	12/20/22	-3.72	±	126.88	-13.77	±	469.46	No
RWMC	10/05/22	-180.19	±	146.43	-666.70	±	541.79	No
	10/12/22	181.08	±	139.59	670.00	±	516.48	No
	10/19/22	58.10	±	131.16	214.97	±	485.29	No
	10/26/22	-5.65	±	136.01	-20.89	±	503.24	No
	11/02/22	-68.82	±	113.96	-254.62	±	421.65	No
	11/09/22	-34.17	±	114.88	-126.44	±	425.06	No
	11/15/22	51.12	±	150.62	189.15	±	557.29	No
	11/22/22	32.14	±	135.31	118.93	±	500.65	No
	11/29/22	-38.32	±	125.33	-141.78	±	463.72	No
	12/06/22	25.86	±	90.82	95.69	±	336.04	No
	12/13/22	141.05	±	143.19	521.89	±	529.80	No
	12/20/22	2.04	±	124.87	7.53	±	462.02	No
RWMC (QA)	10/05/22	6.11	±	152.99	22.63	±	566.06	No

Table C-2. Weekly iodine-131 activity in air.

Sampling Group and Location	Sampling Date	Result ± 1s Uncertainty ($\times 10^{-15}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-11}$ Bq/mL)			Result > 3s
	10/12/22	-34.68	±	147.54	-128.30	±	545.90	No
	10/19/22	-57.80	±	128.07	-213.85	±	473.86	No
	10/26/22	25.50	±	123.50	94.34	±	456.95	No
	11/02/22	-133.46	±	135.48	-493.80	±	501.28	No
	11/09/22	-60.00	±	140.84	-221.99	±	521.11	No
	11/15/22	-76.40	±	156.88	-282.67	±	580.46	No
	11/22/22	5.05	±	126.10	18.70	±	466.57	No
	11/29/22	-25.90	±	115.73	-95.82	±	428.20	No
	12/06/22	-76.96	±	143.79	-284.74	±	532.02	No
	12/13/22	148.10	±	117.19	547.97	±	433.60	No
	12/20/22	2.03	±	122.90	7.52	±	454.73	No
RWMC (SOUTH)	10/05/22	-205.85	±	125.66	-761.65	±	464.94	No
	10/12/22	-159.65	±	147.22	-590.71	±	544.71	No
	10/19/22	-32.51	±	246.87	-120.28	±	913.42	No
	10/26/22	-108.94	±	151.05	-403.08	±	558.89	No
	11/02/22	-81.87	±	118.79	-302.93	±	439.52	No
	11/09/22	-69.56	±	135.45	-257.37	±	501.17	No
	11/15/22	-61.97	±	147.48	-229.29	±	545.68	No
	11/22/22	-31.09	±	131.13	-115.05	±	485.18	No
	11/29/22	-137.04	±	127.95	-507.05	±	473.42	No
	12/06/22	-91.63	±	118.21	-339.04	±	437.38	No
	12/13/22	-57.38	±	139.88	-212.31	±	517.56	No
	12/20/22	-0.47	±	131.82	-1.73	±	487.73	No
SMC	10/05/22	160.34	±	158.19	593.26	±	585.30	No
	10/12/22	-94.64	±	277.04	-350.18	±	1025.05	No
	10/19/22	-175.02	±	148.38	-647.57	±	549.01	No
	10/26/22	-156.50	±	153.97	-579.05	±	569.69	No
	11/02/22	-5.84	±	141.43	-21.59	±	523.29	No
	11/09/22	-179.55	±	148.71	-664.34	±	550.23	No
	11/15/22	181.18	±	162.85	670.37	±	602.55	No
	11/22/22	68.16	±	125.00	252.18	±	462.50	No
	11/29/22	-0.63	±	134.91	-2.32	±	499.17	No
	12/06/22	-51.55	±	139.13	-190.72	±	514.78	No
	12/13/22	-13.12	±	141.25	-48.54	±	522.63	No
	12/20/22	-53.05	±	130.31	-196.28	±	482.15	No
VAN BUREN	10/05/22	-51.85	±	154.86	-191.86	±	572.98	No
	10/12/22	-142.39	±	151.06	-526.84	±	558.92	No
	10/19/22	-104.33	±	152.79	-386.02	±	565.32	No
	10/26/22	71.53	±	123.22	264.66	±	455.91	No
	11/02/22	-85.52	±	145.64	-316.42	±	538.87	No
	11/09/22	64.28	±	130.51	237.83	±	482.89	No
	11/15/22	-10.21	±	155.38	-37.77	±	574.91	No
	11/22/22	0.95	±	115.21	3.52	±	426.28	No
	11/29/22	-42.15	±	122.38	-155.97	±	452.81	No
	12/06/22	-47.04	±	125.98	-174.06	±	466.13	No
	12/13/22	-1.19	±	119.23	-4.42	±	441.15	No
	12/20/22	75.86	±	129.27	280.69	±	478.30	No
VAN BUREN (QA)	10/05/22	-48.57	±	147.41	-179.69	±	545.42	No
	10/12/22	-37.67	±	144.55	-139.38	±	534.84	No
	10/19/22	-128.12	±	151.34	-474.04	±	559.96	No

Table C-2. Weekly iodine-131 activity in air.

Sampling Group and Location	Sampling Date	Result ± 1s Uncertainty ($\times 10^{-15}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-11}$ Bq/mL)			Result > 3s
	10/26/22	19.85	±	127.19	73.46	±	470.60	No
	11/02/22	-33.10	±	143.15	-122.48	±	529.66	No
	11/09/22	-94.31	±	136.25	-348.95	±	504.13	No
	11/15/22	-36.92	±	118.22	-136.59	±	437.41	No
	11/22/22	-85.51	±	139.22	-316.39	±	515.11	No
	11/29/22	-7.01	±	144.97	-25.95	±	536.39	No
	12/06/22	-50.51	±	149.43	-186.87	±	552.89	No
	12/13/22	-21.46	±	132.56	-79.42	±	490.47	No
	12/20/22	171.11	±	136.11	633.11	±	503.61	No

a. Invalid sample identified in red.

Table C-3. Quarterly cesium-137, strontium-90, and actinide concentrations in composite air filters.

Sampling Group and Location	Sampling Date	Analyte	Result ± 1s Uncertainty ($\times 10^{-18}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-14}$ Bq/mL)			Result > 3s
BOUNDARY									
ARCO	12/28/22	Americium-241	8.82	±	4.55	32.63	±	16.84	No
	12/28/22	Cesium-137	44.40	±	86.70	164.28	±	320.79	No
	12/28/22	Plutonium-238	0.90	±	3.90	3.32	±	14.43	No
	12/28/22	Plutonium-239/240	3.57	±	3.09	13.21	±	11.43	No
	12/28/22	Strontium-90	5.37	±	4.78	19.87	±	17.69	No
ATOMIC CITY	12/28/22	Americium-241	5.94	±	4.20	21.98	±	15.54	No
	12/28/22	Cesium-137	-149.00	±	104.00	-551.30	±	384.80	No
	12/28/22	Plutonium-238	3.42	±	4.11	12.65	±	15.21	No
	12/28/22	Plutonium-239/240	3.41	±	4.69	12.62	±	17.35	No
	12/28/22	Strontium-90	40.20	±	18.00	148.74	±	66.60	No
BLUE DOME	12/28/22	Americium-241	2.79	±	5.93	10.32	±	21.94	No
	12/28/22	Cesium-137	-98.80	±	97.00	-365.56	±	358.90	No
	12/28/22	Plutonium-238	5.25	±	5.85	19.43	±	21.65	No
	12/28/22	Plutonium-239/240	31.40	±	7.40	116.18	±	27.38	**Yes**
	12/28/22	Strontium-90	34.20	±	13.10	126.54	±	48.47	No
FAA TOWER	12/28/22	Americium-241	9.28	±	4.89	34.34	±	18.09	No
	12/28/22	Cesium-137	-17.60	±	63.30	-65.12	±	234.21	No
	12/28/22	Plutonium-238	4.31	±	3.41	15.95	±	12.62	No
	12/28/22	Plutonium-239/240	2.15	±	3.03	7.96	±	11.21	No
	12/28/22	Strontium-90	0.40	±	4.85	1.49	±	17.95	No
HOWE	12/28/22	Americium-241	3.01	±	5.21	11.14	±	19.28	No
	12/28/22	Cesium-137	124.00	±	111.00	458.80	±	410.70	No
	12/28/22	Plutonium-238	0.00	±	2.33	0.00	±	8.62	No
	12/28/22	Plutonium-239/240	1.90	±	2.68	7.03	±	9.92	No
	12/28/22	Strontium-90	-16.70	±	9.74	-61.79	±	36.04	No
MONTEVIEW	12/28/22	Americium-241	-1.36	±	5.28	-5.03	±	19.54	No
	12/28/22	Cesium-137	120.00	±	99.10	444.00	±	366.67	No
	12/28/22	Plutonium-238	6.53	±	4.71	24.16	±	17.43	No
	12/28/22	Plutonium-239/240	2.60	±	5.21	9.62	±	19.28	No
	12/28/22	Strontium-90	29.90	±	6.11	110.63	±	22.61	**Yes**
MUD LAKE	12/28/22	Americium-241	1.35	±	3.02	5.00	±	11.17	No
	12/28/22	Cesium-137	-27.60	±	157.00	-102.12	±	580.90	No

Table C-3. Quarterly cesium-137, strontium-90, and actinide concentrations in composite air filters.

Sampling Group and Location	Sampling Date	Analyte	Result ± 1s Uncertainty ($\times 10^{-18}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-14}$ Bq/mL)			Result > 3s
	12/28/22	Plutonium-238	1.47	±	1.80	5.44	±	6.66	No
	12/28/22	Plutonium-239/240	8.07	±	3.36	29.86	±	12.43	No
	12/28/22	Strontium-90	5.94	±	4.98	21.98	±	18.43	No
OFFSITE									
BLACKFOOT	12/31/22	Americium-241	2.68	±	2.36	9.92	±	8.73	No
	12/31/22	Cesium-137	-11.10	±	86.10	-41.07	±	318.57	No
	12/31/22	Plutonium-238	5.98	±	3.09	22.13	±	11.43	No
	12/31/22	Plutonium-239/240	6.83	±	3.42	25.27	±	12.65	No
	12/31/22	Strontium-90	23.50	±	28.60	86.95	±	105.82	No
	12/31/22	Uranium-233/234	20.60	±	4.66	76.22	±	17.24	**Yes**
	12/31/22	Uranium-235	4.27	±	2.57	15.80	±	9.51	No
	12/31/22	Uranium-238	15.90	±	3.53	58.83	±	13.06	**Yes**
CRATERS OF THE MOON	12/31/22	Americium-241	0.00	±	4.02	0.00	±	14.87	No
	12/31/22	Cesium-137	121.00	±	85.60	447.70	±	316.72	No
	12/31/22	Plutonium-238	2.51	±	2.22	9.29	±	8.21	No
	12/31/22	Plutonium-239/240	4.19	±	2.52	15.50	±	9.32	No
	12/31/22	Strontium-90	97.10	±	39.50	359.27	±	146.15	No
	12/31/22	Uranium-233/234	-2.26	±	3.45	-8.36	±	12.77	No
	12/31/22	Uranium-235	0.00	±	2.37	0.00	±	8.77	No
	12/31/22	Uranium-238	-1.92	±	3.03	-7.10	±	11.21	No
DUBOIS	12/28/22	Americium-241	-1.56	±	4.67	-5.77	±	17.28	No
	12/28/22	Cesium-137	89.70	±	76.90	331.89	±	284.53	No
	12/28/22	Plutonium-238	-2.77	±	4.43	-10.25	±	16.39	No
	12/28/22	Plutonium-239/240	-0.92	±	4.01	-3.40	±	14.84	No
	12/28/22	Strontium-90	0.82	±	8.49	3.02	±	31.41	No
DUBOIS (QA)	12/28/22	Americium-241	5.11	±	5.42	18.91	±	20.05	No
	12/28/22	Cesium-137	-123.00	±	85.40	-455.10	±	315.98	No
	12/28/22	Plutonium-238	9.90	±	4.85	36.63	±	17.95	No
	12/28/22	Plutonium-239/240	1.79	±	3.36	6.62	±	12.43	No
	12/28/22	Strontium-90	62.80	±	23.00	232.36	±	85.10	No
IDAHO FALLS	12/31/22	Americium-241	5.34	±	3.87	19.76	±	14.32	No
	12/31/22	Cesium-137	-2.01	±	61.60	-7.44	±	227.92	No
	12/31/22	Plutonium-238	0.00	±	2.17	0.00	±	8.03	No
	12/31/22	Plutonium-239/240	2.30	±	2.55	8.51	±	9.44	No
	12/31/22	Strontium-90	31.40	±	30.60	116.18	±	113.22	No

Table C-3. Quarterly cesium-137, strontium-90, and actinide concentrations in composite air filters.

Sampling Group and Location	Sampling Date	Analyte	Result ± 1s Uncertainty ($\times 10^{-18}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-14}$ Bq/mL)			Result > 3s
	12/31/22	Uranium-233/234	18.80	±	10.00	69.56	±	37.00	No
	12/31/22	Uranium-235	-2.88	±	4.45	-10.66	±	16.47	No
	12/31/22	Uranium-238	10.60	±	7.45	39.22	±	27.57	No
IRC	12/31/22	Americium-241	3.23	±	3.18	11.95	±	11.77	No
	12/31/22	Cesium-137	71.60	±	90.10	264.92	±	333.37	No
	12/31/22	Plutonium-238	3.65	±	2.74	13.51	±	10.14	No
	12/31/22	Plutonium-239/240	4.27	±	3.35	15.80	±	12.40	No
	12/31/22	Strontium-90	78.60	±	28.10	290.82	±	103.97	No
	12/31/22	Uranium-233/234	20.70	±	11.70	76.59	±	43.29	No
	12/31/22	Uranium-235	10.10	±	10.30	37.37	±	38.11	No
	12/31/22	Uranium-238	18.20	±	11.00	67.34	±	40.70	No
IRC (NORTH)	12/31/22	Americium-241	1.40	±	2.80	5.18	±	10.36	No
	12/31/22	Cesium-137	0.00	±	175.00	0.00	±	647.50	No
	12/31/22	Plutonium-238	0.00	±	3.76	0.00	±	13.91	No
	12/31/22	Plutonium-239/240	-1.88	±	4.20	-6.96	±	15.54	No
	12/31/22	Strontium-90	1.11	±	14.20	4.11	±	52.54	No
	12/31/22	Uranium-233/234	10.40	±	4.97	38.48	±	18.39	No
	12/31/22	Uranium-235	0.00	±	2.77	0.00	±	10.25	No
	12/31/22	Uranium-238	17.40	±	4.83	64.38	±	17.87	**Yes**
JACKSON, WY	12/28/22	Americium-241	7.74	±	5.48	28.64	±	20.28	No
	12/28/22	Cesium-137	-141.00	±	158.00	-521.70	±	584.60	No
	12/28/22	Plutonium-238	1.03	±	2.30	3.81	±	8.51	No
	12/28/22	Plutonium-239/240	0.00	±	3.24	0.00	±	11.99	No
	12/28/22	Strontium-90	16.40	±	10.50	60.68	±	38.85	No
SUGAR CITY	12/31/22	Americium-241	2.36	±	2.08	8.73	±	7.70	No
	12/31/22	Cesium-137	40.90	±	149.00	151.33	±	551.30	No
	12/31/22	Plutonium-238	1.46	±	2.06	5.40	±	7.62	No
	12/31/22	Plutonium-239/240	2.19	±	2.19	8.10	±	8.10	No
	12/31/22	Strontium-90	-4.56	±	23.20	-16.87	±	85.84	No
	12/31/22	Uranium-233/234	15.60	±	5.96	57.72	±	22.05	No
	12/31/22	Uranium-235	1.23	±	2.13	4.55	±	7.88	No
	12/31/22	Uranium-238	21.90	±	4.99	81.03	±	18.46	**Yes**

Table C-3. Quarterly cesium-137, strontium-90, and actinide concentrations in composite air filters.

Sampling Group and Location	Sampling Date	Analyte	Result ± 1s Uncertainty ($\times 10^{-18}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-14}$ Bq/mL)			Result > 3s
TERRETON	12/31/22	Americium-241	10.40	±	6.21	38.48	±	22.98	No
	12/31/22	Cesium-137	-47.40	±	171.00	-175.38	±	632.70	No
	12/31/22	Plutonium-238	3.83	±	2.76	14.17	±	10.21	No
	12/31/22	Plutonium-239/240	0.77	±	2.29	2.83	±	8.47	No
	12/31/22	Strontium-90	80.40	±	40.50	297.48	±	149.85	No
	12/31/22	Uranium-233/234	22.00	±	10.70	81.40	±	39.59	No
	12/31/22	Uranium-235	2.10	±	5.96	7.77	±	22.05	No
	12/31/22	Uranium-238	29.50	±	11.20	109.15	±	41.44	No
ONSITE									
ATR COMPLEX	12/31/22	Americium-241	8.23	±	3.96	30.45	±	14.65	No
	12/31/22	Cesium-137	159.00	±	106.00	588.30	±	392.20	No
	12/31/22	Plutonium-238	1.30	±	2.04	4.81	±	7.55	No
	12/31/22	Plutonium-239/240	5.92	±	3.38	21.90	±	12.51	No
	12/31/22	Strontium-90	-21.40	±	26.90	-79.18	±	99.53	No
	12/31/22	Uranium-233/234	4.60	±	7.94	17.02	±	29.38	No
	12/31/22	Uranium-235	8.38	±	7.35	31.01	±	27.20	No
	12/31/22	Uranium-238	18.70	±	9.17	69.19	±	33.93	No
CFA	12/31/22	Americium-241	2.00	±	3.14	7.40	±	11.62	No
	12/31/22	Cesium-137	53.50	±	92.30	197.95	±	341.51	No
	12/31/22	Plutonium-238	-0.80	±	3.55	-2.96	±	13.14	No
	12/31/22	Plutonium-239/240	8.14	±	4.74	30.12	±	17.54	No
	12/31/22	Strontium-90	-58.70	±	28.50	-217.19	±	105.45	No
	12/31/22	Uranium-233/234	9.28	±	9.05	34.34	±	33.49	No
	12/31/22	Uranium-235	2.53	±	7.18	9.36	±	26.57	No
	12/31/22	Uranium-238	5.04	±	7.09	18.65	±	26.23	No
EBR-I	12/31/22	Americium-241	-16.40	±	5.62	-60.68	±	20.79	No
	12/31/22	Cesium-137	132.00	±	113.00	488.40	±	418.10	No
	12/31/22	Plutonium-238	1.66	±	2.35	6.14	±	8.70	No
	12/31/22	Plutonium-239/240	3.33	±	2.63	12.32	±	9.73	No
	12/31/22	Strontium-90	-38.20	±	21.20	-141.34	±	78.44	No
	12/31/22	Uranium-233/234	7.46	±	4.60	27.60	±	17.02	No
	12/31/22	Uranium-235	0.00	±	3.02	0.00	±	11.17	No

Table C-3. Quarterly cesium-137, strontium-90, and actinide concentrations in composite air filters.

Sampling Group and Location	Sampling Date	Analyte	Result ± 1s Uncertainty ($\times 10^{-18}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-14}$ Bq/mL)			Result > 3s
	12/31/22	Uranium-238	11.00	±	3.63	40.70	±	13.43	**Yes**
EFS	12/31/22	Americium-241	1.97	±	2.79	7.29	±	10.32	No
	12/31/22	Cesium-137	101.00	±	197.00	373.70	±	728.90	No
	12/31/22	Plutonium-238	1.63	±	1.63	6.03	±	6.03	No
	12/31/22	Plutonium-239/240	4.88	±	2.58	18.06	±	9.55	No
	12/31/22	Strontium-90	-145.00	±	30.30	-536.50	±	112.11	No
	12/31/22	Uranium-233/234	12.90	±	5.46	47.73	±	20.20	No
	12/31/22	Uranium-235	-5.96	±	4.22	-22.05	±	15.61	No
	12/31/22	Uranium-238	15.70	±	6.08	58.09	±	22.50	No
GATE4	12/31/22	Americium-241	3.00	±	3.00	11.10	±	11.10	No
	12/31/22	Cesium-137	-85.10	±	103.00	-314.87	±	381.10	No
	12/31/22	Plutonium-238	0.88	±	3.16	3.24	±	11.69	No
	12/31/22	Plutonium-239/240	6.12	±	3.16	22.64	±	11.69	No
	12/31/22	Strontium-90	-127.00	±	38.20	-469.90	±	141.34	No
	12/31/22	Uranium-233/234	0.26	±	5.33	0.97	±	19.72	No
	12/31/22	Uranium-235	-4.31	±	4.31	-15.95	±	15.95	No
	12/31/22	Uranium-238	-1.16	±	4.79	-4.29	±	17.72	No
HWY 26 REST AREA	12/31/22	Americium-241	13.40	±	5.80	49.58	±	21.46	No
	12/31/22	Cesium-137	4.04	±	152.00	14.95	±	562.40	No
	12/31/22	Plutonium-238	5.29	±	2.94	19.57	±	10.88	No
	12/31/22	Plutonium-239/240	0.00	±	3.02	0.00	±	11.17	No
	12/31/22	Strontium-90	21.00	±	29.30	77.70	±	108.41	No
	12/31/22	Uranium-233/234	0.47	±	6.46	1.75	±	23.90	No
	12/31/22	Uranium-235	8.81	±	7.72	32.60	±	28.56	No
	12/31/22	Uranium-238	8.12	±	7.35	30.04	±	27.20	No
INTEC (NE CORNER)	12/31/22	Americium-241	2.78	±	2.45	10.29	±	9.07	No
	12/31/22	Cesium-137	125.00	±	87.10	462.50	±	322.27	No
	12/31/22	Plutonium-238	1.06	±	1.69	3.92	±	6.25	No
	12/31/22	Plutonium-239/240	-1.70	±	2.62	-6.29	±	9.69	No
	12/31/22	Strontium-90	-48.70	±	18.10	-180.19	±	66.97	No
	12/31/22	Uranium-233/234	16.00	±	9.12	59.20	±	33.74	No
	12/31/22	Uranium-235	0.00	±	3.75	0.00	±	13.88	No

Table C-3. Quarterly cesium-137, strontium-90, and actinide concentrations in composite air filters.

Sampling Group and Location	Sampling Date	Analyte	Result ± 1s Uncertainty ($\times 10^{-18}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-14}$ Bq/mL)			Result > 3s
	12/31/22	Uranium-238	5.18	±	5.21	19.17	±	19.28	No
INTEC (WEST SIDE)	12/31/22	Americium-241	0.68	±	2.17	2.50	±	8.03	No
	12/31/22	Cesium-137	207.00	±	110.00	765.90	±	407.00	No
	12/31/22	Plutonium-238	1.42	±	2.01	5.25	±	7.44	No
	12/31/22	Plutonium-239/240	2.13	±	1.88	7.88	±	6.96	No
	12/31/22	Strontium-90	-60.60	±	24.60	-224.22	±	91.02	No
	12/31/22	Uranium-233/234	5.93	±	6.42	21.94	±	23.75	No
	12/31/22	Uranium-235	6.91	±	6.05	25.57	±	22.39	No
	12/31/22	Uranium-238	8.49	±	6.45	31.41	±	23.87	No
INTEC (QA)	12/31/22	Americium-241	2.90	±	2.86	10.73	±	10.58	No
	12/31/22	Cesium-137	70.90	±	105.00	262.33	±	388.50	No
	12/31/22	Plutonium-238	4.67	±	2.90	17.28	±	10.73	No
	12/31/22	Plutonium-239/240	5.76	±	3.10	21.31	±	11.47	No
	12/31/22	Strontium-90	69.80	±	24.80	258.26	±	91.76	No
	12/31/22	Uranium-233/234	9.06	±	12.20	33.52	±	45.14	No
	12/31/22	Uranium-235	0.00	±	6.03	0.00	±	22.31	No
	12/31/22	Uranium-238	0.19	±	7.16	0.70	±	26.49	No
MAIN GATE	12/28/22	Americium-241	-4.45	±	4.45	-16.47	±	16.47	No
	12/28/22	Cesium-137	-81.50	±	70.80	-301.55	±	261.96	No
	12/28/22	Plutonium-238	0.00	±	3.29	0.00	±	12.17	No
	12/28/22	Plutonium-239/240	9.26	±	5.43	34.26	±	20.09	No
	12/28/22	Strontium-90	19.00	±	7.46	70.30	±	27.60	No
MFC (NORTH)	12/31/22	Americium-241	2.99	±	2.64	11.06	±	9.77	No
	12/31/22	Cesium-137	11.80	±	72.90	43.66	±	269.73	No
	12/31/22	Plutonium-238	1.84	±	3.44	6.81	±	12.73	No
	12/31/22	Plutonium-239/240	3.68	±	3.44	13.62	±	12.73	No
	12/31/22	Strontium-90	45.00	±	29.90	166.50	±	110.63	No
	12/31/22	Uranium-233/234	-1.32	±	6.19	-4.88	±	22.90	No
	12/31/22	Uranium-235	3.12	±	3.83	11.54	±	14.17	No
	12/31/22	Uranium-238	10.10	±	4.75	37.37	±	17.58	No
MFC (SOUTH)	12/31/22	Americium-241	1.96	±	2.96	7.25	±	10.95	No
	12/31/22	Cesium-137	66.90	±	67.60	247.53	±	250.12	No

Table C-3. Quarterly cesium-137, strontium-90, and actinide concentrations in composite air filters.

Sampling Group and Location	Sampling Date	Analyte	Result ± 1s Uncertainty ($\times 10^{-18}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-14}$ Bq/mL)			Result > 3s
	12/31/22	Plutonium-238	1.25	±	1.96	4.63	±	7.25	No
	12/31/22	Plutonium-239/240	1.79	±	2.59	6.62	±	9.58	No
	12/31/22	Strontium-90	-6.06	±	31.40	-22.42	±	116.18	No
	12/31/22	Uranium-233/234	-0.97	±	7.35	-3.58	±	27.20	No
	12/31/22	Uranium-235	7.48	±	8.78	27.68	±	32.49	No
	12/31/22	Uranium-238	9.07	±	8.21	33.56	±	30.38	No
NRF	12/31/22	Americium-241	2.86	±	3.50	10.58	±	12.95	No
	12/31/22	Cesium-137	105.00	±	74.00	388.50	±	273.80	No
	12/31/22	Plutonium-238	0.00	±	2.21	0.00	±	8.18	No
	12/31/22	Plutonium-239/240	3.49	±	2.10	12.91	±	7.77	No
	12/31/22	Strontium-90	-2.67	±	29.90	-9.88	±	110.63	No
	12/31/22	Uranium-233/234	14.70	±	5.57	54.39	±	20.61	No
	12/31/22	Uranium-235	3.55	±	2.65	13.14	±	9.81	No
	12/31/22	Uranium-238	13.40	±	4.11	49.58	±	15.21	**Yes**
PBF	12/31/22	Americium-241	-1.83	±	2.56	-6.77	±	9.47	No
	12/31/22	Cesium-137	108.00	±	140.00	399.60	±	518.00	No
	12/31/22	Plutonium-238	2.44	±	2.41	9.03	±	8.92	No
	12/31/22	Plutonium-239/240	0.60	±	2.29	2.22	±	8.47	No
	12/31/22	Strontium-90	-37.10	±	24.30	-137.27	±	89.91	No
	12/31/22	Uranium-233/234	5.59	±	8.09	20.68	±	29.93	No
	12/31/22	Uranium-235	0.00	±	5.00	0.00	±	18.50	No
	12/31/22	Uranium-238	13.80	±	8.97	51.06	±	33.19	No
RHLLW	12/31/22	Americium-241	0.80	±	2.87	2.94	±	10.62	No
	12/31/22	Cesium-137	-188.00	±	113.00	-695.60	±	418.10	No
	12/31/22	Plutonium-238	2.36	±	2.08	8.73	±	7.70	No
	12/31/22	Plutonium-239/240	1.57	±	2.23	5.81	±	8.25	No
	12/31/22	Strontium-90	58.60	±	29.90	216.82	±	110.63	No
	12/31/22	Uranium-233/234	8.23		4.91	30.45	±	18.17	No
	12/31/22	Uranium-235	1.18		2.64	4.37	±	9.77	No
	12/31/22	Uranium-238	4.78	±	3.46	17.69	±	12.80	No
RWMC	12/31/22	Americium-241	44.80	±	7.67	165.76	±	28.38	**Yes**
	12/31/22	Cesium-137	66.00	±	71.40	244.20	±	264.18	No

Table C-3. Quarterly cesium-137, strontium-90, and actinide concentrations in composite air filters.

Sampling Group and Location	Sampling Date	Analyte	Result ± 1s Uncertainty ($\times 10^{-18}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-14}$ Bq/mL)			Result > 3s
	12/31/22	Plutonium-238	7.30	±	3.86	27.01	±	14.28	No
	12/31/22	Plutonium-239/240	25.50	±	5.95	94.35	±	22.02	**Yes**
	12/31/22	Strontium-90	-82.90	±	33.30	-306.73	±	123.21	No
	12/31/22	Uranium-233/234	9.64	±	4.42	35.67	±	16.35	No
	12/31/22	Uranium-235	4.93	±	3.28	18.24	±	12.14	No
	12/31/22	Uranium-238	21.60	±	5.09	79.92	±	18.83	**Yes**
RWMC (QA)	12/31/22	Americium-241	30.80	±	6.67	113.96	±	24.68	**Yes**
	12/31/22	Cesium-137	98.60	±	83.60	364.82	±	309.32	No
	12/31/22	Plutonium-238	2.34	±	2.87	8.66	±	10.62	No
	12/31/22	Plutonium-239/240	17.60	±	4.89	65.12	±	18.09	**Yes**
	12/31/22	Strontium-90	-11.00	±	20.50	-40.70	±	75.85	No
	12/31/22	Uranium-233/234	-0.64	±	8.58	-2.36	±	31.75	No
	12/31/22	Uranium-235	-1.38	±	6.09	-5.11	±	22.53	No
	12/31/22	Uranium-238	1.30	±	6.95	4.81	±	25.72	No
RWMC (SOUTH)	12/31/22	Americium-241	5.83	±	4.77	21.57	±	17.65	No
	12/31/22	Cesium-137	72.40	±	85.40	267.88	±	315.98	No
	12/31/22	Plutonium-238	0.68	±	2.44	2.50	±	9.03	No
	12/31/22	Plutonium-239/240	6.08	±	3.39	22.50	±	12.54	No
	12/31/22	Strontium-90	-105.00	±	21.90	-388.50	±	81.03	No
	12/31/22	Uranium-233/234	3.64	±	4.09	13.47	±	15.13	No
	12/31/22	Uranium-235	8.59	±	4.04	31.78	±	14.95	No
	12/31/22	Uranium-238	7.82	±	3.38	28.93	±	12.51	No
SMC	12/31/22	Americium-241	0.00	±	3.27	0.00	±	12.10	No
	12/31/22	Cesium-137	-61.80	±	107.00	-228.66	±	395.90	No
	12/31/22	Plutonium-238	4.58	±	3.06	16.95	±	11.32	No
	12/31/22	Plutonium-239/240	3.81	±	2.53	14.10	±	9.36	No
	12/31/22	Strontium-90	-54.70	±	22.40	-202.39	±	82.88	No
	12/31/22	Uranium-233/234	4.97	±	2.89	18.39	±	10.69	No
	12/31/22	Uranium-235	5.30	±	2.51	19.61	±	9.29	No
	12/31/22	Uranium-238	10.70	±	3.31	39.59	±	12.25	**Yes**
VAN BUREN	12/31/22	Americium-241	-2.52	±	5.04	-9.32	±	18.65	No
	12/31/22	Cesium-137	-128.00	±	150.00	-473.60	±	555.00	No

Table C-3. Quarterly cesium-137, strontium-90, and actinide concentrations in composite air filters.

Sampling Group and Location	Sampling Date	Analyte	Result ± 1s Uncertainty ($\times 10^{-18}$ µCi/mL)			Result ± 1s Uncertainty ($\times 10^{-14}$ Bq/mL)			Result > 3s
	12/31/22	Plutonium-238	3.34	±	2.37	12.36	±	8.77	No
	12/31/22	Plutonium-239/240	5.85	±	3.02	21.65	±	11.17	No
	12/31/22	Strontium-90	-57.90	±	29.40	-214.23	±	108.78	No
	12/31/22	Uranium-233/234	9.55	±	4.09	35.34	±	15.13	No
	12/31/22	Uranium-235	1.21	±	3.21	4.48	±	11.88	No
	12/31/22	Uranium-238	7.84	±	3.42	29.01	±	12.65	No
VAN BUREN (QA)	12/31/22	Americium-241	0.63	±	2.88	2.33	±	10.66	No
	12/31/22	Cesium-137	64.60	±	87.90	239.02	±	325.23	No
	12/31/22	Plutonium-238	4.50	±	2.89	16.65	±	10.69	No
	12/31/22	Plutonium-239/240	-2.17	±	3.38	-8.03	±	12.51	No
	12/31/22	Strontium-90	-13.10	±	37.90	-48.47	±	140.23	No
	12/31/22	Uranium-233/234	2.29	±	6.57	8.47	±	24.31	No
	12/31/22	Uranium-235	3.64	±	8.33	13.47	±	30.82	No
	12/31/22	Uranium-238	17.70	±	10.10	65.49	±	37.37	No

Table C-4. Tritium concentrations in atmospheric moisture.

Sampling Group and Location	Sampling Date	Result ± 1s Uncertainty ($\times 10^{-13}$ $\mu Ci/mL_{air}$)	Result ± 1s Uncertainty ($\times 10^{-9}$ Bq/mL_{air})	Result > 3s
BOUNDARY				
ATOMIC CITY	10/20/22	0.87 ± 1.31	3.21 ± 4.85	No
HOWE	11/16/22	0.66 ± 0.26	2.45 ± 0.95	No
OFFSITE				
CRATERS OF THE MOON	12/13/22	-21.50 ± 34.60	-79.55 ± 128.02	No
IDAHO FALLS	10/17/22	0.30 ± 33.80	1.09 ± 125.06	No
	11/14/22	1.47 ± 0.47	5.44 ± 1.73	**Yes**
ONSITE				
EFS	11/09/22	-104.00 ± 49.00	-384.80 ± 181.30	No
VAN BUREN	10/26/22	50.60 ± 31.90	187.22 ± 118.03	No

Table C-5. Monthly and weekly tritium concentrations in precipitation.

Location	Start Date	End Date	Result ± 1s Uncertainty (pCi/L)			Result ± 1s Uncertainty (Bq/L)			Result > 3s
BOUNDARY									
ATOMIC CITY	10/19/22	10/27/22	24.90	±	31.90	0.92	±	1.18	No
	11/02/22	11/09/22	-9.06	±	21.20	-0.34	±	0.78	No
	11/22/22	11/29/22	31.90	±	32.20	1.18	±	1.19	No
	12/06/22	12/14/22	34.80	±	32.80	1.29	±	1.21	No
	12/14/22	12/20/22	-38.20	±	20.20	-1.41	±	0.75	No
HOWE	10/19/22	10/26/22	18.00	±	31.80	0.67	±	1.18	No
	11/02/22	11/09/22	89.90	±	32.60	3.33	±	1.21	No
	11/09/22	11/16/22	-7.88	±	20.70	-0.29	±	0.77	No
	11/22/22	11/29/22	74.20	±	33.00	2.75	±	1.22	No
	11/29/22	12/06/22	48.60	±	32.90	1.80	±	1.22	No
	12/06/22	12/13/22	13.80	±	22.80	0.51	±	0.84	No
	12/13/22	12/20/22	67.70	±	35.40	2.50	±	1.31	No
OFFSITE									
IDAHO FALLS	10/01/22	10/31/22	66.10	±	32.10	2.45	±	1.19	No
	11/01/22	11/30/22	33.10	±	35.20	1.22	±	1.30	No
	12/01/22	12/31/22	104.00	±	35.70	3.85	±	1.32	No
ONSITE									
EFS	11/02/22	11/09/22	32.80	±	32.30	1.21	±	1.20	No
	11/09/22	11/16/22	-15.60	±	20.60	-0.58	±	0.76	No
	11/22/22	11/29/22	-42.50	±	21.90	-1.57	±	0.81	No
	12/06/22	12/13/22	-40.50	±	21.90	-1.50	±	0.81	No
	12/13/22	12/20/22	49.70	±	32.90	1.84	±	1.22	No

Table C-6. Gross alpha, gross beta, and tritium concentrations in surface and drinking water.

Location	Sampling Date	Analyte	Result ± 1s Uncertainty (pCi/L)			Result ± 1s Uncertainty (Bq/L)			Result > 3s
SURFACE WATER									
ALPHEUS SPRINGS	11/14/22	GROSS ALPHA	1.49	±	0.55	0.06	±	0.02	No
	11/14/22	GROSS BETA	4.87	±	0.64	0.18	±	0.02	**Yes**
	11/14/22	TRITIUM	-29.90	±	33.50	-1.11	±	1.24	No
ALPHEUS SPRINGS (QA)	11/14/22	GROSS ALPHA	0.85	±	0.39	0.03	±	0.01	No
	11/14/22	GROSS BETA	7.50	±	0.43	0.28	±	0.02	**Yes**
	11/14/22	TRITIUM	-13.40	±	33.60	-0.50	±	1.24	No
BILL JONES, JR. TROUT FARM	11/14/22	GROSS ALPHA	1.40	±	0.39	0.05	±	0.01	**Yes**
	11/14/22	GROSS BETA	2.25	±	0.45	0.08	±	0.02	**Yes**
	11/14/22	TRITIUM	-7.69	±	33.20	-0.28	±	1.23	No
CLEAR SPRINGS	11/14/22	GROSS ALPHA	1.62	±	0.67	0.06	±	0.02	No
	11/14/22	GROSS BETA	4.56	±	0.52	0.17	±	0.02	**Yes**
	11/14/22	TRITIUM	-29.50	±	33.50	-1.09	±	1.24	No
DRINKING WATER									
ATOMIC CITY	11/17/22	GROSS ALPHA	1.37	±	0.40	0.05	±	0.01	**Yes**
	11/17/22	GROSS BETA	3.23	±	0.48	0.12	±	0.02	**Yes**
	11/17/22	TRITIUM	-10.70	±	33.60	-0.40	±	1.24	No
CONTROL	11/17/22	GROSS ALPHA	0.12	±	0.12	0.00	±	0.00	No
	11/17/22	GROSS BETA	0.01	±	0.31	0.00	±	0.01	No
	11/17/22	TRITIUM	-19.40	±	22.20	-0.72	±	0.82	No
CRATERS OF THE MOON	11/17/22	GROSS ALPHA	3.01	±	0.51	0.11	±	0.02	**Yes**
	11/17/22	GROSS BETA	2.67	±	0.44	0.10	±	0.02	**Yes**
	11/17/22	TRITIUM	-4.94	±	21.80	-0.18	±	0.81	No
HOWE	01/11/23	GROSS ALPHA	1.60	±	0.38	0.06	±	0.01	**Yes**
	01/11/23	GROSS BETA	2.02	±	0.44	0.07	±	0.02	**Yes**
	01/11/23	TRITIUM	-15.20	±	23.00	-0.56	±	0.85	No
IDAHO FALLS	11/17/22	GROSS ALPHA	0.46	±	0.46	0.02	±	0.02	No
	11/17/22	GROSS BETA	3.43	±	0.50	0.13	±	0.02	**Yes**
	11/17/22	TRITIUM	-48.90	±	22.00	-1.81	±	0.81	No
MINIDOKA	11/14/22	GROSS ALPHA	1.51	±	0.58	0.06	±	0.02	No
	11/14/22	GROSS BETA	4.70	±	0.49	0.17	±	0.02	**Yes**
	11/14/22	TRITIUM	-52.90	±	21.10	-1.96	±	0.78	No
MUD LAKE	11/15/22	GROSS ALPHA	0.20	±	0.25	0.01	±	0.01	No
	11/15/22	GROSS BETA	4.59	±	0.43	0.17	±	0.02	**Yes**
	11/15/22	TRITIUM	-25.50	±	21.50	-0.94	±	0.80	No
REST AREA	11/16/22	GROSS ALPHA	1.38	±	0.42	0.05	±	0.02	**Yes**
	11/16/22	GROSS BETA	3.00	±	0.44	0.11	±	0.02	**Yes**
	11/16/22	TRITIUM	34.60	±	23.30	1.28	±	0.86	No
SHOSHONE	11/14/22	GROSS ALPHA	2.80	±	0.57	0.10	±	0.02	**Yes**
	11/14/22	GROSS BETA	4.23	±	0.48	0.16	±	0.02	**Yes**
	11/14/22	TRITIUM	-26.00	±	22.00	-0.96	±	0.81	No

Table C-7. Weekly and monthly iodine-131 and cesium-137 concentrations in milk.

		Iodine-131							Cesium-137						
	Sampling	Result ± 1s Uncertainty (pCi/L)			Result ± 1s Uncertainty (Bq/L)				Result ± 1s Uncertainty (pCi/L)			Result ± 1s Uncertainty (Bq/L)			
Location	Date							Result > 3s							Result > 3s
CONTROL	10/04/22	0.18	±	1.29	0.01	±	0.05	No	1.63	±	0.86	0.06	±	0.03	No
	11/01/22	-1.24	±	0.99	-0.05	±	0.04	No	1.66	±	0.96	0.06	±	0.04	No
	12/07/22	-0.25	±	0.77	-0.01	±	0.03	No	-0.56	±	2.04	-0.02	±	0.08	No
DIETRICH	10/05/22	-0.65	±	0.95	-0.02	±	0.04	No	0.47	±	0.56	0.02	±	0.02	No
	11/01/22	-1.76	±	1.54	-0.07	±	0.06	No	0.29	±	1.05	0.01	±	0.04	No
	12/06/22	0.48	±	1.43	0.02	±	0.05	No	1.03	±	1.09	0.04	±	0.04	No
(QA)	12/06/22	-1.85	±	1.36	-0.07	±	0.05	No	-2.07	±	1.23	-0.08	±	0.05	No
HOWE	10/04/22	0.79	±	0.70	0.03	±	0.03	No	0.46	±	0.78	0.02	±	0.03	No
	11/01/22	0.30	±	0.75	0.01	±	0.03	No	-0.76	±	0.80	-0.03	±	0.03	No
	12/06/22	-0.16	±	1.04	-0.01	±	0.04	No	0.24	±	0.49	0.01	±	0.02	No
MINIDOKA	10/05/22	0.85	±	0.99	0.03	±	0.04	No	-0.34	±	0.49	-0.01	±	0.02	No
	11/01/22	0.66	±	0.72	0.02	±	0.03	No	-0.40	±	0.52	-0.01	±	0.02	No
	12/06/22	0.07	±	1.16	0.00	±	0.04	No	-0.43	±	0.53	-0.02	±	0.02	No
MONTEVIEW	10/04/22	0.71	±	0.79	0.03	±	0.03	No	0.15	±	0.54	0.01	±	0.02	No
	11/01/22	-0.87	±	0.87	-0.03	±	0.03	No	2.17	±	1.18	0.08	±	0.04	No
	12/07/22	-0.55	±	0.66	-0.02	±	0.02	No	0.32	±	0.98	0.01	±	0.04	No
RIGBY	10/04/22	-0.62	±	1.02	-0.02	±	0.04	No	0.18	±	0.75	0.01	±	0.03	No
	10/11/22	-0.50	±	1.11	-0.02	±	0.04	No	0.27	±	0.48	0.01	±	0.02	No
	10/18/22	0.34	±	0.67	0.01	±	0.02	No	0.12	±	0.63	0.00	±	0.02	No
	10/25/22	1.17	±	1.08	0.04	±	0.04	No	0.72	±	2.15	0.03	±	0.08	No
	11/01/22	0.07	±	1.09	0.00	±	0.04	No	-1.84	±	2.13	-0.07	±	0.08	No
	11/08/22	1.00	±	0.80	0.04	±	0.03	No	0.92	±	0.82	0.03	±	0.03	No
	11/15/22	7.61	±	4.27	0.28	±	0.16	No	2.36	±	5.81	0.09	±	0.22	No
	11/23/22	-3.15	±	3.19	-0.12	±	0.12	No	-2.10	±	6.26	-0.08	±	0.23	No
	11/28/22	1.80	±	1.22	0.07	±	0.05	No	0.69	±	2.19	0.03	±	0.08	No
	12/07/22	0.37	±	0.91	0.01	±	0.03	No	0.42	±	0.57	0.02	±	0.02	No
	12/14/22	1.16	±	0.84	0.04	±	0.03	No	0.05	±	0.50	0.00	±	0.02	No
	12/19/22	-0.07	±	0.77	0.00	±	0.03	No	2.13	±	2.06	0.08	±	0.08	No
TERRETON	10/04/22	-0.58	±	0.58	-0.02	±	0.02	No	-0.22	±	0.48	-0.01	±	0.02	No
(QA)	10/04/22	0.18	±	1.02	-0.08	±	0.04	No	-0.01	±	0.97	-0.06	±	0.04	No
	10/12/22	-1.31	±	0.87	-0.05	±	0.03	No	0.68	±	0.57	0.03	±	0.02	No
	10/18/22	0.84	±	1.58	0.03	±	0.06	No	-0.87	±	1.13	-0.03	±	0.04	No
	10/24/22	0.03	±	0.89	0.00	±	0.03	No	1.44	±	0.72	0.05	±	0.03	No
	11/01/22	-0.64	±	0.67	-0.02	±	0.02	No	0.85	±	0.85	0.03	±	0.03	No
	11/07/22	-0.08	±	0.64	0.00	±	0.02	No	0.00	±	0.51	0.00	±	0.02	No
	11/15/22	-0.07	±	0.64	0.00	±	0.02	No	0.13	±	0.62	0.00	±	0.02	No
	11/23/22	0.61	±	0.86	0.02	±	0.03	No	-0.01	±	1.07	0.00	±	0.04	No
	11/29/22	0.16	±	0.79	0.01	±	0.03	No	-0.13	±	0.70	0.00	±	0.03	No
	12/07/22	-0.07	±	1.00	0.00	±	0.04	No	-0.19	±	0.73	-0.01	±	0.03	No
	12/13/22	-1.07	±	1.20	-0.04	±	0.04	No	-2.29	±	2.05	-0.08	±	0.08	No
	12/19/22	0.15	±	0.65	0.01	±	0.02	No	0.06	±	0.49	0.00	±	0.02	No

Table C-8. Strontium-90 and tritium concentrations in milk.

Location	Sampling Date	Result ± 1s Uncertainty (pCi/L)			Result ± 1s Uncertainty (Bq/L)			Result > 3s
STRONTIUM-90								
CONTROL	11/01/22	0.22	±	0.13	0.01	±	0.00	No
DIETRICH	11/01/22	0.06	±	0.11	0.00	±	0.00	No
HOWE	11/01/22	0.09	±	0.06	0.00	±	0.00	No
MINIDOKA	11/01/22	0.12	±	0.11	0.00	±	0.00	No
MONTEVIEW	11/01/22	0.19	±	0.08	0.01	±	0.00	No
RIGBY	11/01/22	0.08	±	0.08	0.00	±	0.00	No
TERRETON	11/01/22	0.35	±	0.12	0.01	±	0.00	No
TRITIUM								
CONTROL	11/01/22	-26.70	±	24.10	-0.99	±	0.89	No
DIETRICH	11/01/22	-12.50	±	24.80	-0.46	±	0.92	No
HOWE	11/01/22	15.90	±	26.00	0.59	±	0.96	No
MINIDOKA	11/01/22	-36.90	±	24.50	-1.37	±	0.91	No
MONTEVIEW	11/01/22	-72.00	±	23.50	-2.67	±	0.87	No
RIGBY	11/01/22	48.00	±	25.20	1.78	±	0.93	No
TERRETON	11/01/22	-25.10	±	24.10	-0.93	±	0.89	No

Table C-9. Cesium-137 and strontium-90 concentrations in potatoes.

Location	Sampling Date	Result ± 1s Uncertainty pCi/kg			Result ± 1s Uncertainty (x 10^{-2} Bq/kg)			Result > 3s
CESIUM-137								
ARCO	09/14/22	0.45	±	0.91	1.68	±	3.35	No
CINCINNATI, OH	09/27/22	-0.13	±	0.82	-0.49	±	3.04	No
IDAHO FALLS	10/13/22	-0.93	±	0.75	-3.44	±	2.76	No
MORELAND	09/28/22	0.84	±	0.88	3.10	±	3.27	No
MORELAND (QA)	09/28/22	0.29	±	0.87	1.07	±	3.21	No
PINGREE	09/12/22	0.17	±	0.91	0.62	±	3.38	No
POCATELLO	08/31/22	0.88	±	0.81	3.26	±	3.00	No
REXBURG	09/16/22	-0.15	±	0.90	-0.56	±	3.33	No
RUPERT	10/05/22	2.03	±	1.12	7.52	±	4.15	No
SUGAR CITY	09/16/22	1.78	±	0.85	6.59	±	3.15	No
TERRETON	10/04/22	0.69	±	1.22	2.54	±	4.52	No
STRONTIUM-90								
ARCO	09/14/22	1.55	±	9.46	5.74	±	35.04	No
CINCINNATI, OH	09/27/22	-5.30	±	6.61	-19.63	±	24.48	No
IDAHO FALLS	10/13/22	21.80	±	7.53	80.74	±	27.89	No
MORELAND	09/28/22	8.46	±	8.02	31.33	±	29.70	No
MORELAND (QA)	09/28/22	2.58	±	5.26	9.56	±	19.48	No
PINGREE	09/12/22	3.30	±	6.92	12.22	±	25.63	No
POCATELLO	08/31/22	-4.01	±	3.61	-14.85	±	13.37	No
REXBURG	09/16/22	-8.21	±	12.30	-30.41	±	45.56	No
RUPERT	10/05/22	5.09	±	5.26	18.85	±	19.48	No
SUGAR CITY	09/16/22	-11.10	±	5.87	-41.11	±	21.74	No
TERRETON	10/04/22	4.34	±	5.85	16.07	±	21.67	No

Table C-10. Actinide, Cesium-137, and Strontium-90 Concentrations in Soil.

LOCATIONS	Americium-241		Cesium-137		Plutonium-238		Plutonium-239/240		Strontium-90	
	RESULTS (pCi/kg)	BACKGROUND (pCi/kg)	RESULTS (pCi/kg)	BACKGROUND (pCi/kg)	RESULTS (pCi/kg)	BACKGROUND (pCi/kg)	RESULTS (pCi/kg)	BACKGROUND (pCi/kg)	RESULTS (pCi/kg)	BACKGROUND (pCi/kg)
BOUNDARY										
BUTTE CITY	1.11E+01	9.42E+01	**4.18E+02**	1.25E+03	3.83E+00	3.37E+01	**2.45E+01**	4.87E+01	**1.83E+02**	5.60E+02
FAA TOWER	9.09E+00	3.56E+01	**4.81E+02**	1.62E+03	3.63E+00	7.43E+01	**1.88E+01**	8.29E+01	**1.37E+02**	8.06E+02
FRENCHMANS CABIN	4.92E+00	–	**2.03E+02**	–	0.00E+00	–	**2.37E+01**	–	5.82E+01	–
MONTEVIEW	6.84E+00	1.94E+01	**2.93E+02**	1.11E+03	-8.91E-07	3.50E+01	**1.42E+01**	4.77E+01	4.29E+01	2.68E+02
MUD LAKE[a]	6.76E+00	8.75E+01	**1.36E+02**	6.24E+02	4.72E+00	5.14E+01	**1.35E+01**	8.92E+01	1.60E+00	3.35E+02
RECEPTOR 54	**2.06E+01**	–	**8.19E+02**	–	3.10E+00	–	**4.72E+01**	–	**1.38E+02**	–
OFFSITE										
BLACKFOOT	2.37E+00	4.05E+01	**1.43E+02**	2.70E+03	0.00E+00	1.54E+02	5.79E+00	2.39E+02	3.90E+01	3.98E+02
CAREY	1.57E+01	5.56E+01	**5.47E+02**	9.63E+02	5.90E+00	4.47E+01	**2.85E+01**	6.71E+01	**8.68E+01**	5.34E+02
ST. ANTHONY	8.98E+00	4.22E+01	**4.65E+02**	1.76E+03	3.68E+00	8.57E+01	**1.69E+01**	9.54E+01	**1.31E+02**	9.48E+02
ONSITE										
ATOMIC CITY	5.89E+00	2.78E+01	**2.90E+02**	1.01E+03	5.13E+00	2.27E+01	**2.05E+01**	5.73E+01	**7.63E+01**	7.34E+02
EFS	9.39E+00	–	**6.20E+02**	–	4.94E+00	–	**1.90E+01**	–	**2.11E+02**	–
HOWE	4.95E+00	1.00E+01	**3.37E+02**	7.00E+02	1.53E+00	1.19E+01	**1.91E+01**	3.53E+01	-1.06E+01	6.70E+02
RENO RANCH	8.89E+00	2.68E+01	**6.09E+02**	1.58E+03	6.36E+00	1.44E+01	**2.85E+01**	6.77E+01	9.37E+01	9.11E+02
HWY 26 REST AREA	**1.25E+01**	–	**3.34E+02**	–	4.45E+00	–	**2.03E+01**	–	**1.06E+02**	–
RWMC[a]	**1.53E+02**	8.40E+03	**3.72E+02**	3.54E+03	7.10E+00	5.80E+01	**1.51E+02**	2.57E+03	**9.69E+01**	2.47E+03

– Insufficient amount of data to calculate background values.

a. Average of all sample locations.

Table C-11. Gamma-emitting radionuclides in large game animals.

Species	Collection Date	Tissue	Analyte	Result ± 1s Uncertainty (pCi/kg wet weight)			Result ± 1s Uncertainty (x 10^{-2} Bq/kg wet weight)			Result > 3s
ELK	10/12/22	Liver	Cesium-137	2.54	±	1.15	9.40	±	4.26	No
			Iodine-131	2.71	±	5.81	10.03	±	21.50	No
ELK	10/18/22	Liver	Cesium-137	-1.04	±	3.29	-3.85	±	12.17	No
			Iodine-131	-2.63	±	3.84	-9.73	±	14.21	No
ELK	10/12/22	Muscle	Cesium-137	2.29	±	1.81	8.47	±	6.70	No
			Iodine-131	4.92	±	6.28	18.20	±	23.24	No
ELK	10/18/22	Muscle	Cesium-137	3.22	±	1.21	11.91	±	4.48	No
			Iodine-131	-1.11	±	3.24	-4.11	±	11.99	No
ELK	10/12/22	Thyroid	Cesium-137	2.36	±	10.20	8.73	±	37.74	No
			Iodine-131	7.31	±	7.01	27.05	±	25.94	No
ELK	10/18/22	Thyroid	Cesium-137	-2.89	±	4.61	-10.69	±	17.06	No
			Iodine-131	7.61	±	5.30	28.16	±	19.61	No

Table C-12. Actinide, gamma-emitting radionuclide, and strontium-90 concentrations in edible tissues of waterfowl.

Location	Sampling Date	Analyte	Result	± Uncertainty(1s)	pCi/kg	Result	± Uncertainty(1s)	(x 10^{-2}) Bq/kg	Result > 3s
ATR COMPLEX	10/07/22	AMERICIUM-241	0.38	±	0.56	1.41	±	2.07	No
		CESIUM-137	0.80	±	1.57	2.96	±	5.81	No
		CHROMIUM-51	68.00	±	135.00	251.85	±	500.00	No
		COBALT-60	3.15	±	1.27	11.67	±	4.70	No
		PLUTONIUM-238	0.91	±	0.69	3.35	±	2.55	No
		PLUTONIUM-239/240	0.26	±	0.50	0.95	±	1.86	No
		STRONTIUM-90	38.70	±	6.74	143.33	±	24.96	**Yes**
		ZINC-65	4.20	±	4.43	15.56	±	16.41	No
ATR COMPLEX	10/08/22	AMERICIUM-241	0.56	±	0.82	2.07	±	3.03	No
		CESIUM-137	0.19	±	1.80	0.70	±	6.67	No
		CHROMIUM-51	102.00	±	142.00	377.78	±	525.93	No
		COBALT-60	3.37	±	1.94	12.48	±	7.19	No
		PLUTONIUM-238	-0.15	±	0.51	-0.56	±	1.89	No
		PLUTONIUM-239/240	0.58	±	0.73	2.14	±	2.71	No
		STRONTIUM-90	-4.45	±	3.97	-16.48	±	14.70	No
		ZINC-65	-1.09	±	5.28	-4.04	±	19.56	No
ATR COMPLEX	10/08/22	AMERICIUM-241	-0.49	±	0.56	-1.83	±	2.09	No
		CESIUM-137	-9.75	±	13.80	-36.11	±	51.11	No
		CHROMIUM-51	59.10	±	450.00	218.89	±	1666.67	No
		COBALT-60	25.20	±	20.90	93.33	±	77.41	No
		PLUTONIUM-238	0.00	±	0.45	-0.02	±	1.68	No
		PLUTONIUM-239/240	0.21	±	0.63	0.78	±	2.33	No
		STRONTIUM-90	7.71	±	4.49	28.56	±	16.63	No
		ZINC-65	-3.66	±	16.00	-13.56	±	59.26	No
INTEC	08/25/22	AMERICIUM-241	-0.03	±	1.03	-0.10	±	3.81	No
		CESIUM-137	12.60	±	6.08	46.67	±	22.52	No
		CHROMIUM-51	-176.00	±	1260.00	-651.85	±	4666.67	No
		COBALT-60	-2.53	±	5.43	-9.37	±	20.11	No
		PLUTONIUM-238	0.36	±	0.94	1.32	±	3.49	No
		PLUTONIUM-239/240	-0.59	±	1.12	-2.19	±	4.15	No
		STRONTIUM-90	3.12	±	5.37	11.56	±	19.89	No
		ZINC-65	-2.98	±	14.00	-11.04	±	51.85	No
SMC FACILITY	11/08/22	AMERICIUM-241	0.00	±	0.41	-0.01	±	1.51	No
		CESIUM-137	-11.30	±	19.40	-41.85	±	71.85	No
		CHROMIUM-51	-4110.00	±	3120.00	-15222.22	±	11555.56	No
		COBALT-60	-16.00	±	12.70	-59.26	±	47.04	No
		PLUTONIUM-238	1.18	±	0.84	4.37	±	3.10	No
		PLUTONIUM-239/240	-0.42	±	0.61	-1.54	±	2.26	No

Table C-12. Actinide, gamma-emitting radionuclide, and strontium-90 concentrations in edible tissues of waterfowl.

Location	Sampling Date	Analyte	Result	± Uncertainty(1s)		Result	± Uncertainty(1s)		Result > 3s
			pCi/kg			(x 10^{-2}) Bq/kg			
		STRONTIUM-90	-13.80	±	10.70	-51.11	±	39.63	No
		ZINC-65	-6.90	±	55.50	-25.56	±	205.56	No
CONTROL	10/01/22	AMERICIUM-241	0.46	±	0.66	1.69	±	2.43	No
		CESIUM-137	-4.39	±	3.20	-16.26	±	11.85	No
		CHROMIUM-51	-85.20	±	127.00	-315.56	±	470.37	No
		COBALT-60	0.27	±	3.27	1.01	±	12.11	No
		PLUTONIUM-238	-0.12	±	0.93	-0.45	±	3.43	No
		PLUTONIUM-239/240	-0.14	±	0.64	-0.53	±	2.35	No
		STRONTIUM-90	7.40	±	5.08	27.41	±	18.81	No
		ZINC-65	-2.04	±	3.94	-7.56	±	14.59	No
CONTROL	10/01/22	AMERICIUM-241	0.10	±	0.33	0.39	±	1.23	No
		CESIUM-137	1.42	±	1.37	5.26	±	5.07	No
		CHROMIUM-51	-113.00	±	666.00	-418.52	±	2466.67	No
		COBALT-60	-0.16	±	1.84	-0.60	±	6.81	No
		PLUTONIUM-238	0.34	±	0.48	1.24	±	1.78	No
		PLUTONIUM-239/240	-0.02	±	0.41	-0.08	±	1.53	No
		STRONTIUM-90	-8.47	±	4.63	-31.37	±	17.15	No
		ZINC-65	-4.93	±	5.47	-18.26	±	20.26	No
CONTROL	12/02/22	AMERICIUM-241	0.72	±	1.02	2.67	±	3.78	No
		CESIUM-137	-2.38	±	1.14	-8.81	±	4.22	No
		CHROMIUM-51	-56.40	±	426.00	-208.89	±	1577.78	No
		COBALT-60	-2.74	±	1.50	-10.15	±	5.56	No
		PLUTONIUM-238	0.44	±	0.80	1.63	±	2.97	No
		PLUTONIUM-239/240	0.18	±	0.82	0.65	±	3.04	No
		STRONTIUM-90	-6.88	±	3.56	-25.48	±	13.19	No
		ZINC-65	-1.10	±	2.43	-4.07	±	9.00	No

Table C-13. External radiation measurements using OSLDs.

Location	Start Date	End Date	Radiation Measurement ± 1s Uncertainty Result		Sigma Uncertainty mrem	Dose mrem/day
BOUNDARY						
ARCO E-1	05/04/22	11/02/22	57.80	±	2.89	0.32
ARCO O-1	05/04/22	11/02/22	57.50	±	2.88	0.31
ATOMIC CITY E-1	05/02/22	11/02/22	67.40	±	3.37	0.37
ATOMIC CITY O-2	05/04/22	11/02/22	62.50	±	3.13	0.34
BLUE DOME E-1	05/03/22	11/01/22	47.00	±	2.35	0.26
HOWE E-1	05/03/22	11/01/22	58.60	±	2.93	0.32
HOWE O-3	05/03/22	11/01/22	50.70	±	2.54	0.28
MONTEVIEW E-1	05/03/22	11/01/22	63.30	±	3.17	0.35
MONTEVIEW O-4	05/03/22	11/01/22	66.50	±	3.33	0.36
MUD LAKE E-1	05/03/22	11/01/22	72.60	±	3.63	0.40
MUD LAKE O-5	05/03/22	11/01/22	73.70	±	3.69	0.40
RENO RANCH E-1	05/03/22	11/01/22	58.30	±	2.92	0.32
RENO RANCH O-6	05/03/22	11/01/22	54.70	±	2.74	0.30
RRL3 O-1	05/02/22	11/02/22	59.50	±	2.98	0.32
RRL5 O-1	05/02/22	11/01/22	77.70	±	3.89	0.42
RRL6 O-1	05/02/22	11/01/22	61.90	±	3.10	0.34
RRL17 O-1	05/03/22	11/01/22	58.90	±	2.95	0.32
RRL24 O-1	05/03/22	11/01/22	57.00	±	2.85	0.31
Boundary Average			**61.42**			**0.34**
OFFSITE						
ABERDEEN E-1	05/05/22	11/03/22	72.00	±	3.60	0.39
BLACKFOOT E-1 (MOUNTAIN VIEW)	05/04/22	11/02/22	57.80	±	2.89	0.32
BLACKFOOT O-9 (MOUNTAIN VIEW)	05/04/22	11/02/22	54.60	±	2.73	0.30
CRATERS OF THE MOON E-1	05/04/22	11/02/22	63.70	±	3.19	0.35
CRATERS OF THE MOON O-7	05/04/22	11/02/22	63.00	±	3.15	0.35
DUBIOS	05/03/22	11/01/22	50.40	±	2.52	0.28
IDAHO FALLS E-1	05/04/22	11/01/22	65.00	±	3.25	0.36
IDAHO FALLS O-10	05/03/22	11/01/22	55.90	±	2.80	0.31
JACKSON WY	05/05/22	11/07/22	58.00	±	2.90	0.31
MINIDOKA	05/05/22	11/03/22	56.30	±	2.82	0.31
ROBERTS	05/03/22	11/01/22	74.30	±	3.72	0.41
SUGAR CITY	05/03/22	11/01/22	63.70	±	3.19	0.35
Offsite Average			**61.23**			**0.34**
ONSITE						
ANL O-12	05/04/22	11/02/22	55.80	±	2.79	0.31
ANL O-14	05/04/22	11/02/22	71.10	±	3.56	0.39

Table C-13. External radiation measurements using OSLDs.

Location	Start Date	End Date	Radiation Measurement ± 1s Uncertainty			Dose
			Result		Sigma Uncertainty	
			mrem			mrem/day
ANL O-15	05/04/22	11/02/22	76.90	±	3.85	0.42
ANL O-16	05/04/22	11/02/22	62.30	±	3.12	0.34
ANL O-18	05/04/22	11/02/22	62.00	±	3.10	0.34
ANL O-19	05/04/22	11/02/22	55.10	±	2.76	0.30
ANL O-20	05/04/22	11/02/22	62.70	±	3.14	0.34
ANL O-21	05/04/22	11/02/22	87.50	±	4.38	0.48
ANL O-22	05/04/22	11/02/22	76.40	±	3.82	0.42
ANL O-23	05/04/22	11/02/22	68.50	±	3.43	0.38
ANL O-24	05/04/22	11/02/22	67.90	±	3.40	0.37
ANL O-25	05/04/22	11/02/22	67.80	±	3.39	0.37
ANL O-26	05/04/22	11/02/22	71.60	±	3.58	0.39
ANL O-7	05/04/22	11/02/22	64.00	±	3.20	0.35
ANL O-8	05/04/22	11/02/22	61.70	±	3.09	0.34
ARA I&II O-1	05/02/22	11/02/22	69.50	±	3.48	0.38
CFA O-1	05/02/22	11/02/22	73.20	±	3.66	0.40
EBR I O-1	05/02/22	11/02/22	56.30	±	2.82	0.31
EBR I O-2	05/02/22	11/02/22	87.10	±	4.36	0.47
EBR I O-3	05/02/22	11/02/22	235.00	±	11.75	1.28
EFS O-1	05/03/22	11/01/22	71.70	±	3.59	0.39
GATE4 O-1	05/03/22	11/01/22	63.10	±	3.16	0.35
HAUL E O-1	05/03/22	11/02/22	64.40	±	3.22	0.35
HAUL W O-2	05/03/22	11/02/22	65.10	±	3.26	0.36
HWY20 MILE O-266	05/03/22	11/01/22	64.20	±	3.21	0.35
HWY20 MILE O-270	05/03/22	11/01/22	59.00	±	2.95	0.32
HWY20 MILE O-276	05/03/22	11/02/22	67.80	±	3.39	0.37
HWY22 T28 O-1	05/03/22	11/01/22	77.80	±	3.89	0.43
HWY28 N2300 O-2	05/03/22	11/01/22	50.50	±	2.53	0.28
HWY33 T17 O-3	05/03/22	11/01/22	60.60	±	3.03	0.33
ICPP O-14	05/02/22	11/01/22	100.70	±	5.04	0.55
ICPP O-15	05/02/22	11/01/22	145.40	±	7.27	0.79
ICPP O-17	05/02/22	11/01/22	78.30	±	3.92	0.43
ICPP O-19	05/02/22	11/01/22	93.30	±	4.67	0.51
ICPP O-20	05/02/22	11/01/22	325.30	±	16.27	1.78
ICPP O-21	05/02/22	11/01/22	94.70	±	4.74	0.52
ICPP O-22	05/02/22	11/01/22	92.10	±	4.61	0.50
ICPP O-25	05/02/22	11/01/22	92.10	±	4.61	0.50
ICPP O-26	05/02/22	11/01/22	71.70	±	3.59	0.39

Table C-13. External radiation measurements using OSLDs.

Location	Start Date	End Date	Radiation Measurement ± 1s Uncertainty Result		Sigma Uncertainty	Dose
			mrem			mrem/day
ICPP O-27	05/02/22	11/01/22	232.90	±	11.65	1.27
ICPP O-28	05/02/22	11/01/22	183.30	±	9.17	1.00
ICPP O-30	05/02/22	11/01/22	205.50	±	10.28	1.12
ICPP O-9	05/02/22	11/01/22	85.50	±	4.28	0.47
ICPP TREEFARM O-1	05/02/22	11/01/22	138.10	±	6.91	0.76
ICPP TREEFARM O-2	05/02/22	11/01/22	91.20	±	4.56	0.50
ICPP TREEFARM O-3	05/02/22	11/01/22	98.30	±	4.92	0.54
ICPP TREEFARM O-4	05/02/22	11/01/22	139.50	±	6.98	0.76
IF-603E O-2	05/04/22	11/01/22	46.80	±	2.34	0.26
IF-603N O-1	05/04/22	11/01/22	56.30	±	2.82	0.31
IF-603S O-3	05/04/22	11/01/22	51.60	±	2.58	0.28
IF-603W O-4	05/04/22	11/01/22	55.60	±	2.78	0.31
IF-616N O-36	05/02/22	11/01/22	57.30	±	2.87	0.31
IF-627 O-30	05/04/22	11/01/22	52.10	±	2.61	0.29
IF-638E O-2	05/04/22	11/01/22	52.70	±	2.64	0.29
IF-638N O-1	05/04/22	11/01/22	58.60	±	2.93	0.32
IF-638S O-3	05/04/22	11/01/22	57.80	±	2.89	0.32
IF-638W O-4	05/04/22	11/01/22	56.80	±	2.84	0.31
IF-652A O-1	05/04/22	11/02/22	66.50	±	3.33	0.36
IF-652A O-2[a]	05/04/22	11/02/22	--	±	--	--
IF-652A O-3	05/04/22	11/01/22	66.50	±	3.33	0.37
IF-652A O-4	05/04/22	11/02/22	75.70	±	3.79	0.41
IF-665 O-1	05/02/22	11/02/22	46.60	±	2.33	0.25
IF-665 O-2	05/02/22	11/02/22	58.20	±	2.91	0.32
IF-665 O-3	05/02/22	11/02/22	53.50	±	2.68	0.29
IF-665 O-4	05/02/22	11/02/22	59.40	±	2.97	0.32
IF-665 O-5	05/02/22	11/02/22	56.20	±	2.81	0.31
IF-665W O-37	05/02/22	11/02/22	49.90	±	2.50	0.27
IF-670D O-34	05/02/22	11/01/22	53.00	±	2.65	0.29
IF-670E O-32	05/02/22	11/01/22	44.90	±	2.25	0.25
IF-670N O-31	05/02/22	11/01/22	53.30	±	2.67	0.29
IF-670S O-33	05/02/22	11/01/22	56.80	±	2.84	0.31
IF-670W O-35	05/02/22	11/01/22	62.70	±	3.14	0.34
IF-675D O-33	05/02/22	11/01/22	48.60	±	2.43	0.27
IF-675E O-31	05/02/22	11/01/22	54.60	±	2.73	0.30
IF-675S O-34	05/02/22	11/01/22	57.60	±	2.88	0.31
IF-675W O-35	05/02/22	11/01/22	54.00	±	2.70	0.29

Table C-13. External radiation measurements using OSLDs.

Location	Start Date	End Date	Radiation Measurement ± 1s Uncertainty			Dose
			Result		Sigma Uncertainty	
			mrem			mrem/day
IF-688B O-1	05/04/22	11/01/22	49.40	±	2.47	0.27
IF-688B O-2	05/04/22	11/01/22	49.80	±	2.49	0.27
IF-689 O-7	05/04/22	11/01/22	57.40	±	2.87	0.32
IF-689 O-8	05/04/22	11/01/22	53.30	±	2.67	0.29
IF-IDA O-38	05/04/22	11/01/22	51.70	±	2.59	0.29
IF-IRC O-39	05/04/22	11/01/22	59.30	±	2.97	0.33
LINCOLNBLVD O-1	05/02/22	11/02/22	62.70	±	3.14	0.34
LINCOLNBLVD O-15	05/03/22	11/01/22	77.60	±	3.88	0.43
LINCOLNBLVD O-25	05/03/22	11/01/22	68.40	±	3.42	0.38
LINCOLNBLVD O-3	05/03/22	11/01/22	62.00	±	3.10	0.34
LINCOLNBLVD O-5	05/03/22	11/01/22	68.60	±	3.43	0.38
LINCOLNBLVD O-9	05/03/22	11/01/22	73.50	±	3.68	0.40
MAIN GATE O-1	05/02/22	11/02/22	65.50	±	3.28	0.36
NRF O-11	05/03/22	11/02/22	63.90	±	3.20	0.35
NRF O-16	05/03/22	11/02/22	65.10	±	3.26	0.36
NRF O-18	05/03/22	11/02/22	71.70	±	3.59	0.39
NRF O-19	05/03/22	11/02/22	69.40	±	3.47	0.38
NRF O-20	05/03/22	11/02/22	64.30	±	3.22	0.35
NRF O-21	05/03/22	11/02/22	56.60	±	2.83	0.31
NRF O-22	05/03/22	11/02/22	60.00	±	3.00	0.33
NRF O-23	05/03/22	11/02/22	57.40	±	2.87	0.31
NRF O-24	05/03/22	11/02/22	65.10	±	3.26	0.36
PBF SPERT O-1	05/02/22	11/02/22	67.30	±	3.37	0.37
REST O-1	05/03/22	11/02/22	61.50	±	3.08	0.34
RHLLW O-1	05/03/22	11/01/22	79.50	±	3.98	0.44
RHLLW O-2	05/03/22	11/01/22	64.80	±	3.24	0.36
RHLLW O-3	05/03/22	11/01/22	62.50	±	3.13	0.34
RHLLW O-4	05/03/22	11/01/22	71.80	±	3.59	0.39
RHLLW O-5	05/03/22	11/01/22	74.00	±	3.70	0.41
RHLLW O-6	05/03/22	11/01/22	65.50	±	3.28	0.36
RobNOAA	05/03/22	11/01/22	63.00	±	3.15	0.35
RWMC O-11A	05/02/22	11/02/22	73.20	±	3.66	0.40
RWMC O-13A	05/02/22	11/02/22	90.60	±	4.53	0.49
RWMC O-19A	05/02/22	11/02/22	58.40	±	2.92	0.32
RWMC O-21A	05/02/22	11/02/22	61.30	±	3.07	0.33
RWMC O-23A	05/02/22	11/02/22	77.80	±	3.89	0.42
RWMC O-25A	05/02/22	11/02/22	67.20	±	3.36	0.37

Table C-13. External radiation measurements using OSLDs.

Location	Start Date	End Date	Radiation Measurement ± 1s Uncertainty			Dose
			Result		Sigma Uncertainty	
			mrem			mrem/day
RWMC O-27A	05/02/22	11/02/22	71.70	±	3.59	0.39
RWMC O-29A	05/02/22	11/02/22	70.80	±	3.54	0.38
RWMC O-39	05/02/22	11/02/22	71.80	±	3.59	0.39
RWMC O-3A	05/02/22	11/02/22	61.40	±	3.07	0.33
RWMC O-41	05/02/22	11/02/22	153.90	±	7.70	0.84
RWMC O-43	05/02/22	11/02/22	72.30	±	3.62	0.39
RWMC O-46	05/02/22	11/02/22	70.40	±	3.52	0.38
RWMC O-47	05/02/22	11/02/22	61.20	±	3.06	0.33
RWMC O-5A	05/02/22	11/02/22	63.10	±	3.16	0.34
RWMC O-7A	05/02/22	11/02/22	58.40	±	2.92	0.32
RWMC O-9A	05/02/22	11/02/22	93.50	±	4.68	0.51
TAN LOFT O-10	05/03/22	11/01/22	71.20	±	3.56	0.39
TAN LOFT O-11	05/03/22	11/01/22	67.50	±	3.38	0.37
TAN LOFT O-12	05/03/22	11/01/22	60.90	±	3.05	0.33
TAN LOFT O-13	05/03/22	11/01/22	62.10	±	3.11	0.34
TAN LOFT O-6	05/03/22	11/01/22	72.50	±	3.63	0.40
TAN LOFT O-7	05/03/22	11/01/22	69.00	±	3.45	0.38
TAN LOFT O-8	05/03/22	11/01/22	58.80	±	2.94	0.32
TAN LOFT O-9	05/03/22	11/01/22	60.40	±	3.02	0.33
TRA O-1	05/03/22	11/01/22	78.50	±	3.93	0.43
TRA O-10	05/04/22	11/01/22	115.50	±	5.78	0.64
TRA O-11	05/04/22	11/01/22	118.40	±	5.92	0.65
TRA O-12	05/04/22	11/01/22	82.00	±	4.10	0.45
TRA O-13	05/04/22	11/01/22	85.20	±	4.26	0.47
TRA O-14	05/03/22	11/01/22	69.00	±	3.45	0.38
TRA O-15	05/03/22	11/01/22	65.80	±	3.29	0.36
TRA O-16	05/04/22	11/01/22	68.70	±	3.44	0.38
TRA O-17	05/09/22	11/01/22	66.00	±	3.30	0.37
TRA O-18	05/09/22	11/01/22	73.70	±	3.69	0.42
TRA O-19	05/09/22	11/01/22	82.30	±	4.12	0.47
TRA O-20	05/09/22	11/01/22	67.30	±	3.37	0.38
TRA O-21	05/09/22	11/01/22	70.30	±	3.52	0.40
TRA O-22	05/09/22	11/01/22	71.10	±	3.56	0.40
TRA O-23	05/03/22	11/01/22	68.60	±	3.43	0.38
TRA O-24	05/04/22	11/01/22	75.40	±	3.77	0.42
TRA O-25	05/04/22	11/01/22	78.10	±	3.91	0.43
TRA O-26	05/04/22	11/01/22	77.40	±	3.87	0.43

Table C-13. External radiation measurements using OSLDs.

Location	Start Date	End Date	Radiation Measurement ± 1s Uncertainty			Dose
			Result		Sigma Uncertainty	
			mrem			mrem/day
TRA O-27	05/04/22	11/01/22	69.70	±	3.49	0.39
TRA O-28	05/04/22	11/01/22	65.80	±	3.29	0.36
TRA O-6	05/04/22	11/01/22	66.30	±	3.32	0.37
TRA O-7	05/04/22	11/01/22	77.50	±	3.88	0.43
TRA O-8	05/04/22	11/01/22	77.40	±	3.87	0.43
TRA O-9	05/04/22	11/01/22	80.80	±	4.04	0.45
TREAT O-1	05/03/22	11/02/22	62.20	±	3.11	0.34
TREAT O-2	05/03/22	11/02/22	68.30	±	3.42	0.37
TREAT O-3	05/03/22	11/02/22	71.20	±	3.56	0.39
TREAT O-4	05/03/22	11/02/22	71.00	±	3.55	0.39
TREAT O-5	05/03/22	11/02/22	68.20	±	3.41	0.37
TREAT O-6	05/03/22	11/02/22	63.20	±	3.16	0.35
TREAT O-7	05/03/22	11/02/22	70.90	±	3.55	0.39
TREAT O-8	05/03/22	11/02/22	66.20	±	3.31	0.36
VANB O-1	05/02/22	11/02/22	70.70	±	3.54	0.38
Onsite Average			**74.71**			**0.41**

a. Lost

Appendix D
Statistical Analysis Results

Table D-1. Results of the Kruskal-Wallace one-way analysis of variance by ranks between onsite, boundary, and offsite sample groups by quarter and by month.

GROSS ALPHA					
Quarter	**Valid N**	**Sum of Ranks**	**Mean Ranks**	**H[a]**	**P[b]**
Boundary	94	25165.00	267.7128		
Onsite	247	51471.00	208.3846	14.30245	0.0008
Offsite	107	23940.00	223.7383		
October	**Valid N**	**Sum of Ranks**	**Mean Ranks**	**H[a]**	**P[b]**
Boundary	31	2809.000	90.61290		
Onsite	80	5343.500	66.79375	7.069190	0.0292
Offsite	36	2725.500	75.70833		
November	**Valid N**	**Sum of Ranks**	**Mean Ranks**	**H[a]**	**P[b]**
Boundary	39	4526.500	116.0641		
Onsite	105	9199.000	87.6095	7.914748	0.0191
Offsite	44	4040.500	91.8295		
December	**Valid N**	**Sum of Ranks**	**Mean Ranks**	**H[a]**	**P[b]**
Boundary	24	1488.500	62.02083		
Onsite	62	3392.500	54.71774	0.8797255	0.6441
Offsite	27	1560.000	57.77778		
GROSS BETA					
Quarter	**Valid N**	**Sum of Ranks**	**Mean Ranks**	**H[a]**	**P[b]**
Boundary	94	25852.50	275.0266		
Onsite	247	51889.50	210.0789	18.16723	0.0001
Offsite	107	22834.00	213.4019		
October	**Valid N**	**Sum of Ranks**	**Mean Ranks**	**H[a]**	**P[b]**
Boundary	31	2906.000	93.74194		
Onsite	80	5477.000	68.46250	8.455655	0.0146
Offsite	36	2495.000	69.30556		
November	**Valid N**	**Sum of Ranks**	**Mean Ranks**	**H[a]**	**P[b]**
Boundary	39	4885.000	125.2564		
Onsite	105	8869.500	84.4714	16.19131	0.0003
Offsite	44	4011.500	91.1705		

Table D-1. continued.

December	Valid N	Sum of Ranks	Mean Ranks	H[a]	P[b]
Boundary	24	1701.500	70.89583		
Onsite	62	3324.000	53.61290	5.506232	0.0637
Offsite	27	1415.500	52.42593		

a. Kruskal Wallis test statistic calculated using mean ranks. This test assumes H is approximately distributed as χ^2.
b. A p-value (probability value) greater than 0.05 signifies no statistical difference between data groups. Any values below 0.05 are indicated in red.

Table D-2. Results of multiple comparisons of gross alpha results between locations during the fourth quarter. A 'p' value greater than 0.05 signifies no statistical difference between data groups. Any values below 0.05 are indicated in red. 'R' represents the average rank for each location.

Depend.: Coded result ($x10^{-15}$)	Multiple Comparisons p values (2-tailed); Coded Result (x10-15) (4th-Qtr-22-LVf in 4th-Qtr-22-LVf-Rev1) Independent (grouping) variable: GeographicName Kruskal-Wallis test: H (33, N= 400) =52.70814 p =.0161 Include condition: v8='gross alpha'																																
	Arco R:251.21	Atomic City R:251.33	ATR Complex R:218.25	Blackfoot R:175.00	Blue Dome R:242.32	CFA R:178.95	Craters of the Moon R:81.250	Dubois R:258.92	EBR 1 R:199.42	EFS R:195.20	FAA Tower R:204.42	Gate 4 R:203.33	Highway 26 Rest Area R:187.58	Howe R:260.64	Idaho Falls R:194.42	INTEC (NE corner) R:209.13	INTEC (westside) R:190.96	IRC R:221.29	IRC North R:172.38	Jackson WY R:228.21	Main Gate R:225.54	MFC North R:126.70	MFC South R:178.50	Monteview R:263.96	Mud Lake R:249.13	NRF R:220.67	PBF R:94.375	RHLLW R:187.04	RWMC R:222.58	RWMC South R:184.46	SMC R:191.88	Sugar City R:187.46	Terreton R:200.17	Van Buren R:151.75
Arco		1.000000	1.000000	1.000000	1.000000	1.000000	0.177929	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.499981	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
Atomic City	1.000000		1.000000	1.000000	1.000000	1.000000	0.176125	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.495255	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
ATR Complex	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
Blackfoot	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
Blue Dome	1.000000	1.000000	1.000000	1.000000		1.000000	0.474246	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
CFA	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
Craters of the Moon	0.177929	0.176125	1.000000	1.000000	0.474246	1.000000		0.093742	1.000000	1.000000	1.000000	1.000000	1.000000	0.113067	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.060808	0.210661	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
Dubois	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.093742		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.274955	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
EBR 1	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
EFS	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
FAA Tower	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
Gate 4	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
Highway 26 Rest Area	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
Howe	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.113067	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.320236	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
Idaho Falls	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
INTEC (NE corner)	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
INTEC (westside)	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
IRC	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
IRC North	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
Jackson WY	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
Main Gate	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
MFC North	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
MFC South	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
Monteview	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.060808	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	0.183445	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
Mud Lake	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.210661	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	0.585156	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
NRF	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
PBF	0.499981	0.495255	1.000000	1.000000	1.000000	1.000000	1.000000	0.274955	1.000000	1.000000	1.000000	1.000000	1.000000	0.320236	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.183445	0.585156	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
RHLLW	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
RWMC	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
RWMC South	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000
SMC	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000
Sugar City	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000
Terreton	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000
Van Buren	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	

Table D-3. Results of multiple comparisons of gross beta results between locations during the fourth quarter. A 'p' value greater than 0.05 signifies no statistical difference between data groups. Any values below 0.05 are indicated in red. 'R' represents the average rank for each location.

Multiple Comparisons p values (2-tailed); Coded Result (x10-15) (4th-Qtr-22-LVf in 4th-Qtr-22-LVf-Rev1)
Independent (grouping) variable: GeographicName
Kruskal-Wallis test: H (33, N= 400) =56.04266 p =.0074
Include condition: v8='gross beta'

Depend.: Coded result ($x10^{-15}$)	Arco R:254.46	Atomic City R:258.21	ATR Complex R:186.42	Blackfoot R:181.50	Blue Dome R:228.00	CFA R:199.32	Craters of the Moon R:54.458	Dubois R:225.33	EBR 1 R:200.21	EFS R:210.85	FAA Tower R:210.92	Gate 4 R:194.25	Highway 26 Rest Area R:190.63	Howe R:259.91	Idaho Falls R:194.13	INTEC (NE corner) R:181.92	INTEC (westside) R:186.88	IRC R:205.13	IRC North R:186.29	Jackson WY R:246.71	Main Gate R:233.83	MFC North R:147.10	MFC South R:169.46	Monteview R:265.21	Mud Lake R:284.96	NRF R:209.96	PBF R:103.92	RHLLW R:186.04	RWMC R:189.58	RWMC South R:196.83	SMC R:190.21	Sugar City R:178.71	Terreton R:216.13	Van Buren R:187.96
Arco		1.000000	1.000000	1.000000	1.000000	1.000000	0.012688	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.799569	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
Atomic City	1.000000		1.000000	1.000000	1.000000	1.000000	0.008881	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.605613	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
ATR Complex	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
Blackfoot	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
Blue Dome	1.000000	1.000000	1.000000	1.000000		1.000000	0.181311	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
CFA	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
Craters of the Moon	0.012688	0.008881	1.000000	1.000000	0.181311	1.000000		0.165091	1.000000	0.887425	0.514410	1.000000	1.000000	0.011615	1.000000	1.000000	1.000000	0.792274	1.000000	0.026020	0.081053	1.000000	1.000000	0.004490	0.000585	0.553055	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.344663	1.000000
Dubois	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.165091		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
EBR 1	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
EFS	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.887425	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
FAA Tower	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.514410	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
Gate 4	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
Highway 26 Rest Area	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
Howe	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.011615	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.688837	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
Idaho Falls	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
INTEC (NE corner)	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
INTEC (westside)	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
IRC	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.792274	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
IRC North	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
Jackson WY	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.026020	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
Main Gate	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.081053	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
MFC North	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
MFC South	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
Monteview	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.004490	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	0.354880	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
Mud Lake	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.000585	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	0.070246	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
NRF	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.553055	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
PBF	0.799569	0.605613	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.688837	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.354880	0.070246	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
RHLLW	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
RWMC	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
RWMC South	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000	1.000000
SMC	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000	1.000000
Sugar City	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000	1.000000	1.000000
Terreton	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.344663	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000		1.000000
Van Buren	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	

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