



**Sandia
National
Laboratories**

**ANNUAL SITE
ENVIRONMENTAL
SUMMARY REPORT**

2023

ALBUQUERQUE

NEW MEXICO

Bobcat (*Lynx rufus*) near the
Solar Tower by Steven Allen



DOE/NNSA and Sandia are committed to ***safeguarding the environment, assessing sustainability practices, and ensuring the validity and accuracy of the monitoring data*** presented in this summary of the 2023 SNL/NM annual site environmental report.

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This report summarizes the environmental protection and monitoring programs in place at Sandia National Laboratories, New Mexico (SNL/NM) during calendar year 2023. While most 2023 program activities were performed continuously, they are reported on a calendar year basis unless otherwise noted. Programs based on the fiscal year operate from October 1 through September 30, annually.

Detailed information on these programs can be found in the full annual site environmental report, accessed via the QR code.





Technical Area I

ENVIRONMENTAL MANAGEMENT SYSTEM

The environmental management system is Sandia's primary platform for implementing the environmental management programs that help achieve annual site sustainability goals. A robust environmental management system ensures a structured approach to identifying environmental aspects, setting environmental objectives, and monitoring environmental performance. Sandia's Environmental Management System is ISO 14001:2015 certified. Personnel at SNL/NM follow the system's requirements, as verified by an annual external, third-party audit.

For fiscal year 2023, the significant aspects for Sandia operations were: greenhouse gas air emissions, hazardous materials and waste, and water use.

Sandia has established environmental programs at SNL/NM, presented in the following pages, that are instrumental in implementing, maintaining, and continually improving the Environmental Management System at this site.





A harvester ant (*Pogonomyrmex species*) making its way up the summer grasses near Technical Area I

Sandia sustainability practices and goals are defined in a site sustainability plan. An annual plan provides a roll-up of sustainability data from all primary Sandia sites including SNL/NM.

Highlights for SNL/NM in 2023 include (1) decreasing the year-over-year greenhouse gas emissions relative to fiscal year 2022, (2) updating the implementation status of the vulnerability assessment and resilience plan solutions, (3) decreasing potable water intensity by 35.9 percent relative to a fiscal year 2021 baseline, and (4) meeting sustainable building standards, with 33.3 percent of the building count complying with the *Guiding Principles for Sustainable Federal Buildings*. In contrast, energy intensity increased by 19.1 percent relative to baseline year, fiscal year 2015.

Additionally, personnel at SNL/NM diverted 75.2 percent of nonhazardous solid waste from treatment and disposal facilities and diverted 83.8 percent of construction and demolition waste from treatment and disposal facilities.

As a result of electronics stewardship best practices, 93.7 percent of acquisitions met environmentally sustainable electronics standards, 100 percent of operations used power management features during computer and monitor use, and 100 percent of end-of-life equipment was disposed of through government programs or certified recyclers.

SITE SUSTAINABILITY





Greater short-horned lizard (*Phrynosoma hernandesi*)

Occurrences are defined as “events or conditions that adversely affect, or may adversely affect, DOE (including the National Nuclear Security Administration) or contractor personnel, the public, property, the environment, or the DOE mission.”

ENVIRONMENTAL PERFORMANCE

DOE/NNSA assesses environmental performance through data measures and indicators and then reports on this as part of an annual performance evaluation. The performance evaluation is the DOE/NNSA report card that ascribes a rating for five key performance goals and an overall rating. During the most recent evaluation, Sandia earned a rating of very good for the Mission Enablement performance goal, which includes the objective of delivering effective, efficient, and responsive Environment, Safety, and Health quality. By exceeding almost all the objectives and key outcomes under the performance goals, Sandia received an overall rating of excellent for fiscal year 2023.

For the annual site environmental report, the Occurrence Reporting and Processing System database was queried for occurrences related to environmental programs and compliance. During 2023, four occurrences met the criteria for reporting in the annual site environmental report.

Additionally, all environmental monitoring was conducted in accordance with program-specific plans that contain applicable quality assurance elements and meet appropriate federal, state, and local requirements for conducting sampling and analysis activities.



AIR QUALITY COMPLIANCE PROGRAM

Air Quality Compliance Program personnel support compliance with air quality regulations, permits, and other requirements. In Bernalillo County, New Mexico, the City of Albuquerque Air Quality Program implements air quality regulations and standards established by the U.S. Environmental Protection Agency (EPA) and the Albuquerque Bernalillo County Air Quality Control Board.

2023 Program activities and results:

During 2023, emissions from permitted and registered stationary sources were: 8.9 tons of combined hazardous air pollutants, 26.21 tons of volatile organic compounds, 11 tons of carbon monoxide, 1.79 tons of nitrogen oxides, 8.7 tons of particulate matter with a diameter $\leq 10 \mu\text{m}$, and 0.09 tons of sulfur dioxide. These emissions were within permitted limits.

During fiscal year 2023, operations at SNL/NM directly emitted a total of 87,058 tons of carbon dioxide-equivalent emissions.

Sandia Solar Tower at sunset



PM_{2.5} monitor

AMBIENT AIR SURVEILLANCE PROGRAM

Ambient air quality is monitored for particulate matter and analyzed for metals and radiological constituents. Particulate matter that has a diameter equal to or less than 2.5 μm , or PM_{2.5} was measured at two monitoring locations (CPMSTEOM and A3BAM).

2023 Program activities and results:

The 2023 annual average for one-hour PM_{2.5} measurements was 3.19 $\mu\text{g}/\text{m}^3$ at A3BAM and 5.75 $\mu\text{g}/\text{m}^3$ at CPMSTEOM. The highest monthly average PM₁₀ (particulate matter that has a diameter equal to or less than 10 μm) concentration in fiscal year 2023 was 63.49 $\mu\text{g}/\text{m}^3$, which occurred in the first quarter of fiscal year 2023.

The PM₁₀ samples are also analyzed for metals and radiological constituents, and the majority of the fiscal year 2023 averages were well below threshold limit values. The average result for gross alpha was measured, but the data was excluded due to quality assurance procedures; the average result for gross beta was measured at 9.51E-03 pCi/m³. Both of these radiological constituents have a threshold limit value of zero.





Meteorology Tower at SNL/NM

Meteorology Program personnel provide forecasts (e.g., wind speeds, precipitation percentages, and lightning possibilities) and analyses of past weather conditions (including wind gusts, average wind speed, and total precipitation values) to inform go/no go decisions for future tests for all Sandia programs and operations that require atmospheric information. Such parties include health and safety operations personnel, emergency management response personnel, regulatory permitting and reporting programs personnel, and general research and development groups.

Meteorological monitoring is conducted through a network of meteorological observation towers located across Kirtland Air Force Base.

2023 Program activities and results:

Meteorology Program personnel provided services, data, and analyses to support project planning decisions in 2023. Routine instrument calibrations and a preventive maintenance field program ensured data quality.

In 2023, local conditions across SNL/NM were generally in line with the statewide pattern, observing warmer and drier conditions than average and ending the year in severe drought.

METEOROLOGY PROGRAM





Redbud (*Cercis* species) in spring in Technical Area I

CHEMICAL INFORMATION SYSTEM AND CHEMICAL EXCHANGE PROGRAM

The Chemical Information System is a comprehensive chemical information tool used to track workplace chemical and biological containers by location. The primary drivers for the Chemical Information System are state and federal regulations, including the Emergency Planning and Community Right-to-Know Act.

The Chemical Exchange Program at SNL/NM was developed in 1989 as a hazardous waste management waste minimization program. The goal is to reduce the amount of usable chemicals disposed of as waste and instead make them available for reuse, thereby lowering the cost for both new acquisitions and disposal.

2023 Program activities and results:

In 2023, chemical containers at SNL/NM were tracked along with information about any related chemical hazards. Three hundred and two chemicals were submitted to the Chemical Exchange Program in 2023; 252 chemicals were accepted, and 56 chemicals were reapplied.





Historic Building 6501, the Non-Hazardous Assembly Facility
(photograph by Norman Johnson, October 25, 2011)

Cultural Resources Program personnel focus primarily on long-term preservation and protection of cultural resources and cultural resource compliance to ensure that the heritage of Sandia operating areas and their landscapes are maintained. Long-term preservation and protection also ensure that data are available to make proper land use decisions and to assist with environmental planning. The program is centered on two main cultural resource categories: archaeological resources and historic buildings.

2023 Program activities and results:

In 2023, 12 archaeological surveys were conducted; no cultural resources were affected by ongoing or proposed activities.

The Sandia historian completed historic building assessments in response to new proposed actions at 32 properties that required consultation in 2023. Consultation between DOE/NNSA and the State Historic Preservation Officer is complete on 28 of the actions. Consultation is ongoing for four projects at three buildings begun in 2023; the projects are expected to be completed in 2024. In accordance with the memorandum of agreement between DOE/NNSA and the New Mexico State Historic Preservation Officer, Building 862 was demolished in 2023. The consultation on demolishing Structure S6624 and Building 6625, begun in 2021, was completed in 2023, and a signed memorandum of agreement is in place between DOE/NNSA and the New Mexico State Historic Preservation Officer.

CULTURAL RESOURCES PROGRAM





ECOLOGY PROGRAM

Ecology Program personnel perform several monitoring, compliance, and staff support activities throughout each year, including vegetation monitoring and surveillance; ecological restoration and revegetation; reptile and amphibian, bird, and wildlife surveillance; passive bat monitoring using bioacoustic recordings; and Eco Ticket responses.

Vegetation

In 2023, the Assessment, Inventory, and Monitoring vegetation monitoring strategy was used to assess three new plots quantitatively. In addition, the revegetation subject matter expert supported three ecological restoration projects, participated in 17 Facilities Conceptual Location Analysis planning processes, reviewed 50 National Environmental Policy Act (NEPA) checklists, and provided monitoring for ongoing restoration projects.

Greater roadrunner (*Geococcyx californianus*)



Elk (*Cervus canadensis*) documented at the Madera Guzzler for the first time in 2023

ECOLOGY PROGRAM
(CONTINUED)

Reptiles and Amphibians

During 2023 reptile and amphibian field monitoring, 107 individuals representing 14 species were recorded using drift fence arrays with funnel traps: 7 snake species, 6 lizard species, and 1 amphibian species. Species diversity was slightly lower compared to average at the monitoring sites in 2023.

Birds

In 2023, a breeding bird survey was conducted in June. Fifty-one species and 519 individuals were detected across the transect. The 2023 winter bird survey was completed in February. Forty-one species and 364 individuals were detected. Monitoring Avian Productivity and Survivorship protocol banding sessions were run from May through July. Nineteen species were captured, and 90 individuals were newly banded. Six fall migration banding sessions were run from September to October 2023. Seventeen species and 56 individuals were newly banded.

Wildlife

Ecology Program personnel maintain two wildlife water guzzlers: the Madera Canyon Guzzler and the Range Guzzler. Since June 2005, 71 species have been recorded and identified at the Madera Canyon Guzzler. Six of these species have been documented each year since monitoring began, including the American black bear (*Ursus americanus*), common raven (*Corvus corax*), coyote (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*), mourning dove (*Zenaida macroura*), and mule deer (*Odocoileus hemionus*).



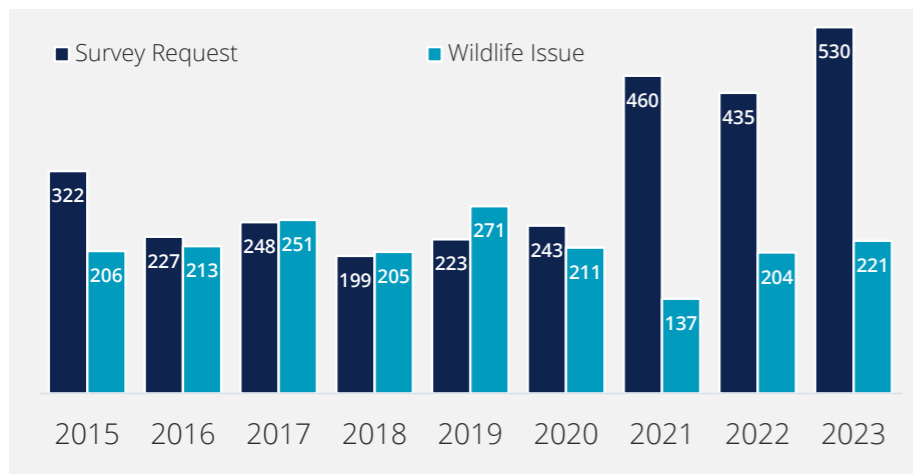


Biologists checking reptile traps

In 2023, 20 different species were observed at the Madera Canyon Guzzler, including 7 mammal species and 13 bird species. Since monitoring began, 73 species have been recorded and identified at the Range Guzzler. Two species have been observed in images at the Range Guzzler every year of monitoring: gray fox and mule deer. In 2023, 24 different species were observed at the Range Guzzler, including 8 mammal species and 16 bird species.

Eco Ticket Response

Sandia personnel use Eco Ticket, a web-based ticketing system, to report wildlife issues or concerns and request biological surveys. In 2023, 221 wildlife issues or requests were received through Eco Ticket. There were 50 snake removal tickets in 2023, an increase from 2022. Of the 50 tickets, 23 were for venomous snakes. Ecology Program personnel received 530 Eco Ticket requests for biological surveys in 2023. The majority of these tickets were part of “Facilities Work Orders.” These are routine, small-scope requests; campus maintenance activities are included in this work order category. The remaining 135 requests were for projects that did not fall under routine maintenance activities. Outdoor testing and large-scale construction activities made up the majority of these requests.



Eco Ticket requests by major category, 2015-2023

ECOLOGY PROGRAM (CONTINUED)





Local students interacting with the watershed model

ENVIRONMENTAL EDUCATION OUTREACH

Environmental Education Outreach personnel connect with the local community and Sandia personnel through organized events. In addition to complying with requirements, it is recognized that education about reducing environmental impacts at work and at home is important. An integrated approach is employed to communicate environmental awareness to personnel via newsletters, annual campaigns, and outreach events.

2023 Program activities and results:

Events conducted in 2023 included a virtual Earth Day and a virtual presentation of the annual Environmental Excellence Awards. The annual Environmental Excellence Awards are presented in recognition of Sandia personnel who demonstrate environmental excellence in areas such as energy and water conservation, environmental protection, waste minimization, and recycling. Since the inception of the awards in 2006, there have been 298 nominations for contributions to the vision of environmental excellence across all of Sandia's sites.

Additionally, environmental professionals visited 40 public school classrooms in the Albuquerque area to complete a watershed model activity with students in support of the RiverXchange education program.





Prickly pear cactus (*Opuntia*)

ENVIRONMENTAL RELEASE, RESPONSE, AND REPORTING TEAM

Environmental Release, Response, and Reporting Team personnel are contacted in the event of any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of material into the environment, which may include, but is not limited to soil, water, air, and drain systems.

2023 Program activities and results:

In 2023, no releases met the criteria for reporting to the EPA. The chemical inventory report for 2023 was submitted to support compliance with the Emergency Planning and Community Right-to-Know Act. The chemical inventory report documents toxic chemicals in use and all chemical purchases.

Chemical use at SNL/NM did not meet the reporting threshold for submitting a toxic release inventory report for any chemicals in 2023.

In 2023, there was one release to the environment that required reporting to the New Mexico Environment Department. In August, approximately 10 gallons of vanadium electrolyte were released from a commercial flow battery system. The batteries were drained and removed, and the contaminated asphalt, concrete, and soil were also removed. Final soil samples confirmed that all contaminated material had been removed.





ENVIRONMENTAL RESTORATION OPERATIONS

The Environmental Restoration Project (now Environmental Restoration Operations) was created under the DOE Office of Environmental Management to identify, assess, and remediate sites potentially contaminated by past spill, release, or disposal activities in accordance with Resource Conservation and Recovery Act, as amended by the Hazardous and Solid Waste Amendments of 1984.

2023 Program activities and results:

In 2023, six sites remained in corrective action status, including three groundwater areas of concern and three active test facilities. In 2023, routine samples were collected for the three groundwater areas of concern: Technical Area V Groundwater, Tijeras Arroyo Groundwater, and Burn Site Groundwater. For the Technical Area V Groundwater area of concern, 17 monitoring wells were sampled in 2023. Several results exceeded the maximum contaminant levels (MCLs) for trichloroethene (six wells) and nitrate plus nitrite (two wells). For the Tijeras Arroyo Groundwater area of concern, 21 monitoring wells were sampled. In the perched groundwater system, the nitrate plus nitrite concentration exceeded the nitrate MCL at five wells, tetrachloroethene exceeded the MCL at one well, and trichloroethene exceeded the MCL at two wells. For the Burn Site Groundwater area of concern, 13 wells were sampled in 2023. Nitrate plus nitrite exceeded the MCLs in five wells. For the Burn Site Groundwater area of concern, 13 wells were sampled in 2023. Nitrate plus nitrite exceeded the MCLs in five wells.

Black swallowtail (*Papilio polyxenes*)





Northern mockingbird (*Mimus polyglottos*)

LONG-TERM STEWARDSHIP PROGRAM

The Long-Term Stewardship Program is designed to protect human health and the environment from hazards associated with residual contamination at legacy sites and to minimize environmental liability by ensuring compliance with environmental requirements in multiple permits.

2023 Program activities and results:

In 2023, post-closure care activities were conducted at two permitted units, and long-term monitoring and maintenance activities were conducted at numerous solid waste management units. All Resource Conservation and Recovery Act Facility Operating Permit-required physical inspections were completed in 2023. The need to replace weathered signs was observed and resolved in 2023.

The 2023 Corrective Action Management Unit soil vapor monitoring results continue to show the edge of the residual soil vapor plume emanating from the nearby former Chemical Waste Landfill. The 2023 soil moisture monitoring results remained consistent with the baseline data for the primary subliner and vertical sensor array monitoring subsystems with no trigger levels exceeded. In 2023, 200 gallons of leachate were removed from the leachate collection system compared to 218 gallons in 2022. The evapotranspirative cover continues to meet revegetation criteria and is in excellent condition with even coverage of native perennial grasses.





Dark monsoon clouds over a test article

Groundwater Monitoring

At the Chemical Waste Landfill, semiannual groundwater monitoring was performed in accordance with post-closure care permit requirements. Groundwater samples were analyzed for volatile organic compounds (including trichloroethene), nickel, and chromium. The results were consistent with previous years; trichloroethene was the only volatile organic compound detected. No analytes were detected at concentrations exceeding EPA MCLs or post-closure care permit-defined hazardous concentration limits.

Semiannual groundwater monitoring was also performed at the Mixed Waste Landfill. All groundwater samples were analyzed for volatile organic compounds; metals including cadmium chromium, nickel, and uranium; specific radionuclides by gamma spectroscopy; gross alpha and gross beta; tritium; and radon-222. Results were consistent with previous years, and no analytes were detected at concentrations exceeding EPA MCLs or Long-Term Monitoring and Maintenance Plan-defined trigger levels. Additional groundwater samples were collected in April to analyze for perfluorohexane sulfonic acid, perfluorooctane sulfonic acid, and perfluorooctanoic acid in accordance with a New Mexico Environment Department request. There were no detections above laboratory method detection limits in any groundwater sample for those polyfluoroalkyl substances (PFAS).

LONG-TERM STEWARDSHIP
PROGRAM
(CONTINUED)





Broad-tailed hummingbird (*Selasphorus platycercus*) on Russian Sage (*Salvia yangii*)

LONG-TERM STEWARDSHIP PROGRAM
(CONTINUED)

Groundwater Monitoring Program personnel also sampled 16 wells and one spring in 2023. Groundwater samples were analyzed for the following parameters: Safe Water Drinking Act list volatile organic compounds, total organic halogens, total phenols, total alkalinity, nitrate plus nitrite, total cyanide, major anions, Target Analyte List metals, mercury, gamma spectroscopy, gross alpha and beta, radium-226, and radium-228. A subset of the locations were sampled for high explosive compounds, dissolved uranium (as mass), and isotopic uranium. Fluoride was detected above the maximum allowable concentration at Coyote Springs and five groundwater wells. Beryllium concentrations at Coyote Springs exceeded EPA MCLs. The exceedance for each of these elements is attributable to the elevated natural concentrations.

Field quality control samples associated with these groundwater sampling programs included duplicate environmental, equipment blank, field blank, and trip blank samples.





Redbud (*Cercis spp.*)

MATERIALS SUSTAINABILITY AND POLLUTION PREVENTION PROGRAMS

Materials sustainability and pollution prevention programs help reduce the amount and toxicity of waste streams generated throughout SNL/NM.

Materials Sustainability Program

Materials Sustainability Program personnel educate, influence, and track compliance with federal regulations, including procuring products that meet environmental specifications, such as biobased and recycled content standards and energy and water efficiency standards.

Pollution Prevention Program

Pollution Prevention Program personnel provide educational materials and recycling receptacles and also conduct outreach and promotion to ensure that personnel can participate in recycling efforts, which are necessary to meet Sandia's Zero Waste goal. Sandia has changed its Zero Waste by 2025 initiative to Zero Waste Every Day. The goal will be accomplished when operations meet the internationally accepted definition of "Zero Waste," which means reducing waste by 90 percent from the baseline year (2008).

2023 Program activities and results:

Materials Sustainability Program personnel successfully led an interdepartmental working group that deployed the Sustainable Facilities Tool (SFTool+) in 2023 to track compliance with new DOE sustainability requirements. In addition, program personnel ensured that the 350APR "green language" clause continued to be





Golden hour at Coyote Test Field

populated in applicable contract categories valued over \$250,000. The 350APR clause states that a subcontractor shall “provide its services in a manner that promotes the expanded use of green products, reduces greenhouse gas emissions and protects the health and wellbeing of building occupants, service providers and visitors in the facility.” The addition of this clause in subcontractor contracts and the requirement to use SFTool+ for reporting generated data for over \$38,000,000 spent in fiscal year 2023. This data captured purchases that were compliant and noncompliant with environmental specifications in seven federal programs that outline product parameters. Data collected on biobased product purchases increased by 114 percent from 2022, which provides evidence that implementation of the SFTool+ has helped to improve compliance with the governing Federal Acquisition Regulations.

Since establishing the goal of Zero Waste by 2025, the rate of diverting waste at SNL/NM from the landfill went from 47 percent in the baseline year of 2008 to 64 percent in 2022. Under the new Zero Waste Every Day initiative, 75 percent of waste at SNL/NM was diverted from the landfill in 2023.

MATERIALS
SUSTAINABILITY AND
POLLUTION PREVENTION
PROGRAMS
(CONTINUED)





NATIONAL
ENVIRONMENTAL POLICY
ACT PROGRAM

NEPA Program personnel provide technical assistance to ensure that Sandia operations and activities are reviewed for NEPA compliance at all Sandia sites. For all proposed projects and activities, project owners must complete a NEPA checklist using the online NEPA Module application. After reviewing a NEPA checklist, NEPA Program personnel determine whether proposed activities have been evaluated in existing NEPA documentation. The checklist is forwarded to the Sandia Field Office if the proposal is not covered by existing NEPA documentation. In addition, relevant environmental program subject matter experts review NEPA checklists to identify any applicable environmental permitting or other requirements.

2023 Program activities and results:

In 2023, NEPA Program personnel reviewed 323 proposed projects through the NEPA module, and an additional 326 routine maintenance activities were reviewed through the Routine Maintenance Criteria SharePoint site. Program personnel submitted 23 Air Force 813 forms on behalf of the DOE/NNSA Sandia Field Office. In addition, NEPA Program personnel developed a corrective action plan in 2023 to create efficiencies and ensure that deliverables are comprehensive and actionable and meet statutory and regulatory requirements. The goal of the corrective action plan is to better facilitate DOE/NNSA decision-making to effect efficient mission execution at SNL/NM. NEPA Program personnel continued to support DOE/NNSA in the preparation of a new site-wide environmental impact statement for SNL/NM.

Desert Tarantula (*Aphonopelma chalcodes*)





Super moon above the Solar Tower

TERRESTRIAL SURVEILLANCE PROGRAM

Terrestrial Surveillance Program personnel collect various environmental sample media, including surface soil, arroyo sediment, and river sediment samples at on site, off-site, and perimeter locations.

2023 Program activities and results:

Soil and sediment samples are analyzed for the presence of radiological and nonradiological (metals) hazards.

Analysis of 2023 results for selected radionuclides revealed no statistically significant population differences or any increasing trends in the on-site location sample results. Analysis results for metals identified 12 instances of statistical significance for the following metals: aluminum, arsenic, beryllium, chromium (total), copper, iron, nickel, selenium, and thallium. The results from this group of metals were compared to reference values and to results from previous years. No results met or exceeded New Mexico Environment Department soil screening levels for residential use.

Three on-site locations were analyzed for high explosive compounds; there were no detections above the method detection limit. One on-site location was analyzed for perchlorate. The estimated perchlorate result was below the New Mexico Environment Department soil screening level for residential use.

Environmental dosimeters used to measure the dose from ambient gamma radiation indicated levels within natural background values in 2023.





WASTE MANAGEMENT PROGRAM

Paintbrush (*Castilleja species*)

Wastes (including solid wastes, hazardous wastes, and radioactive wastes) are generated during ongoing operations. The wastes are collected and managed (i.e., stored, treated, and packaged) at SNL/NM before shipment to off-site permitted facilities.

2023 Program activities and results:

In 2023, the following types of waste were handled and shipped: low-level radioactive waste, mixed low-level radioactive waste, hazardous waste, polychlorinated biphenyl waste, other regulated waste (asbestos-containing wastes, chemical waste, and infectious waste), and solid waste. Recycled commercial, construction, and demolition solid waste were also managed as were regulated or chemical wastes. The quantities of each type of waste vary from year to year, and the 2023 quantities were similar to quantities generated and managed in previous years.

During 2023, DOE/NNSA and Sandia personnel met all regulatory deadlines, shipped no mixed transuranic waste to the Waste Isolation Pilot Plant for disposal, and provided an annual update of mixed waste activities during the previous year. In addition, Sandia personnel managed 1.76 cubic meters of mixed transuranic waste and 0.10 cubic meters of mixed waste that was subject to the Federal Facility Compliance Order.

New Mexico Environment Department Hazardous Waste Bureau representatives performed a no-notice hazardous waste compliance evaluation inspection of the entire SNL/NM site from April 3 to 5, 2023. The New Mexico Environment Department issued a final notice of violation on December 1, 2023. The notice of violation included two findings related to container labels and one finding related to emergency equipment. All findings were corrected during the inspection, and no further action was required.



Apache plume (*Fallugia paradoxa*)

Oil Storage Program activities support regulatory compliance associated with managing, operating, and maintaining oil storage containers and equipment. As required by 40 CFR 112, Oil Pollution Prevention, Oil Storage Program personnel maintain and implement the site-wide Sandia National Laboratories Spill Prevention, Control, and Countermeasure Plan, which describes the oil storage facilities at SNL/NM and the mitigation controls in place to prevent inadvertent discharges of oil.

2023 Program activities and results:

In 2023, the inventory of oil storage containers operating under the Sandia National Laboratories Spill Prevention, Control, and Countermeasure Plan included 47 stationary aboveground storage tanks. Additional oil storage capacity in 55-gallon drums, mobile and portable containers, mobile refuelers, and oil-filled operational equipment exists throughout the site. There were no reportable oil spills in 2023.

OIL STORAGE PROGRAM





Albuquerque sunset

RADIONUCLIDE NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS PROGRAM

EPA regulates radionuclide air emissions in accordance with 40 CFR 61, Subpart H, “National Emission Standards for Emissions of Radionuclides Other than Radon from Department of Energy Facilities,” and has established an effective dose equivalent limit of 10 mrem/year to any member of the public resulting from all radionuclide air emissions from a DOE facility. An annual Radionuclide National Emission Standards for Hazardous Air Pollutants (NESHAP) report summarizes radionuclide air emission releases from Sandia facilities and presents the results of the annual dose assessment. DOE/NNSA submits the annual report to EPA and the City of Albuquerque Environmental Health Department. The radionuclide air emission data provided in the annual site environmental report is pulled from the 2023 NESHAP report.

2023 Program activities and results:

In 2023, the primary radionuclides released from Sandia facilities were argon-41 and tritium. Calculated doses were well below the 10 mrem/year dose limit set by the EPA and DOE. A summary of radionuclide releases and public doses resulting from operations at SNL/NM in 2023 can be found in the full annual site environmental report and the *Radionuclide NESHAP Annual Report CY 2023, SNL/NM*.





Coyote Springs

SAFE DRINKING WATER PROTECTION PROGRAM

Safe Drinking Water Protection Program activities ensure the availability of safe drinking water for all people at Sandia-operated facilities. Program personnel work in conjunction with Infrastructure Operations personnel to maintain compliance with applicable federal, state, and local requirements. Program personnel also coordinate operations that maintain, test, and inspect appropriate backflow prevention activities, and submit the Annual Sandia Field Office Backflow/Cross Connection Certification to Kirtland Air Force Base.

Drinking water at SNL/NM is supplied by the Kirtland Air Force Base-owned system. Sandia personnel adhere to New Mexico Environment Department regulations when operating and maintaining the drinking water system.

2023 Program activities and results:

In 2023, Safe Drinking Water Protection Program personnel coordinated with Kirtland Air Force Base to support compliance activities such as sampling, inspections, and access to Sandia-controlled premises. Kirtland Air Force Base publishes an annual summary of drinking water quality on their website.





Great horned owl (*Bubo virginianus*) at the Robotic Vehicle Range

Stormwater Program personnel maintain regulatory compliance with federal, state, tribal, and local stormwater requirements via National Pollutant Discharge Elimination System permit coverage consisting of the Construction General Permit, the Middle Rio Grande Municipal Separate Storm Sewer System Permit, and the Multi-Sector General Permit.

2023 Program activities and results:

All required compliance activities were conducted in 2023. Monthly compliance inspections were conducted at 16 construction sites under the Construction General Permit and at 18 sites under the Multi-Sector General Permit. Water quality sampling was conducted at 16 locations under the Multi-Sector General Permit and at five locations under the Municipal Separate Storm Sewer System Permit. The water quality sampling results for 2023 can be found in the full annual site environmental report.

STORMWATER PROGRAM





Groundwater sampling under a double rainbow at the newly drilled monitoring well just north of Technical Area V.

SURFACE DISCHARGE PROGRAM

Surface Discharge Program personnel evaluate all water and water-based compounds that discharge to the ground surface at SNL/NM for compliance with New Mexico Water Quality Control Commission regulations as implemented by the Ground Water Quality Bureau.

2023 Program activities and results:

In 2023, 19 individual discharge requests at SNL/NM met applicable standards and were approved. Approved releases complied with New Mexico Environment Department-applicable requirements. Sandia personnel continue to operate two evaporative lagoons through Discharge Permit 530 issued by the New Mexico Environment Department Ground Water Quality Bureau. Samples were collected from Lagoon 1 on August 17, 2023, and from Lagoon 2 on August 28, 2023. Sample fractions were collected for major ions, total dissolved solids, and purgeable and extractable organics as specified in DP-530. Laboratory analysis results indicated that all detected constituents met the state standards, with the exception of fluoride at Lagoon 1. This is suspected to be due to a slightly higher concentration of anions in the sediment from evaporation.



The Albuquerque Bernalillo County Water Utility Authority presented DOE/NNSA and Sandia with six Pretreatment Gold Awards in 2023. Gold awards are given for 100 percent compliance with wastewater discharge permit reporting requirements, zero notices of violation, and an exceptional level of permit compliance



Red yucca (*Hesperaloe parviflora*) summer seed pods

WASTEWATER DISCHARGE PROGRAM

All wastewater discharges are monitored to meet regulatory compliance. Toxic discharges are further reduced by implementing toxic organic management plans, general good housekeeping, and engineering practices.

2023 Program activities and results:

In 2023, wastewater was monitored and three permit-mandated split samplings were conducted with the Albuquerque Bernalillo County Water Utility Authority. All routine monitoring and split sampling events met the standards set by the Albuquerque Bernalillo County Water Utility Authority Sewer Use and Wastewater Control Ordinance requirements.

In January and June 2023, the Albuquerque Bernalillo County Water Utility Authority performed annual inspections of facilities that discharge within permitted flow basins. No issues or findings were identified during any of these inspections.





Sandia National Laboratories



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