SANDIA NATIONAL LABORATORIES

## ANNUAL SITE SUMMARY REPORT

ΤΟΝΟΡΑΗ, ΝΕΥΑΟΑ

DOE 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 2022 SNL/TTR annual site environmental report.

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This report summarizes the environmental protection and monitoring programs in place at Sandia National Laboratories, Tonopah Test Range (SNL/TTR) during calendar year 2022.

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





Tonopah Test Range Area 3 Compound



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. SNL/TTR personnel follow the system's requirements, as verified by an external, third-party audit in 2020. This environmental management system is Sandia's primary platform for implementing the environmental management programs that help achieve annual site sustainability goals.

**For fiscal year 2022**, hazardous materials, hazardous waste, radiological waste, release of explosives and combustion byproducts, and release of radionuclides were identified as significant aspects for operations at SNL/TTR.

Sandia management takes environmental stewardship seriously.

## ENVIRONMENTAL MANAGEMENT SYSTEM





Great Basin fritillary (Speyeria egleis)

A site sustainability plan for all Sandia primary locations, including SNL/TTR, is prepared annually and identifies contributions toward meeting U.S. Department of Energy (DOE) sustainability goals and the broader sustainability program set forth in EO 14008, *Tackling the Climate Crisis at Home and Abroad*. Sandia's most recent plan, *Fiscal Year 2023 Site Sustainability Plan*, describes the performance status for fiscal year 2022.

**Highlights for SNL/TTR in 2022** include decreasing the year-over-year Scope 1 and Scope 2 greenhouse gas emissions relative to fiscal year 2021, completing a vulnerability assessment and resilience plan, decreasing potable water intensity by 44.2 percent relative to fiscal year 2021, and exceeding the goal for consumption of clean and renewable electric energy. Improvements to the ecomedes tool promoted sustainable acquisition and improvements to MAN-004, *Sandia National Laboratories/New Mexico Design Standards Manual*, promoted compliance with the *Guiding Principles for Sustainable Buildings*. In 2022, energy intensity increased by 4.9 percent relative to fiscal year 2021 at SNL/ TTR.

## SITE SUSTAINABILITY





Old car in Nevada field

## ENVIRONMENTAL PERFORMANCE

## During the most recent DOE evaluation, Sandia earned an overall rating of very good.

DOE assesses environmental performance through measures and indicators and then reports on this as part of an overall performance evaluation.

#### **2022** Program activities and results:

There was one DOE-reportable occurrence at SNL/TTR in 2022 related to a survey of the drinking water system. In October 2021, the Nevada Division of Environmental Protection conducted a sanitary survey of the SNL/ TTR public water system. On December 30, 2021, one significant deficiency related to corrosion on piping in the well pumphouse and five other deficiencies related to administrative or system design considerations were noted. In 2022, Sandia personnel actively worked with engineers as per the proposed path forward that the DOE National Nuclear Security Administration Sandia Field Office sent to the Nevada Division of Environmental Protection.

All environmental monitoring in 2022 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 personnel ensure that operations comply with federal and state air quality regulations promulgated in accordance with the Clean Air Act and the Clean Air Act Amendments of 1990. Program personnel also confirm that operations are compliant with the SNL/TTR Class II Air Quality Operating Permit issued by the State of Nevada. In Nye County, the Nevada Department of Environmental Protection implements air quality regulations and standards established by the Environmental Protection Agency and the State of Nevada.

#### **2022** Program activities and results:

Sandia has an air quality permit at SNL/TTR, and emissions from permitted sources complied with permitted limits in 2022. During 2022, emissions from permitted sources were 0.003 tons of hazardous air pollutants, 0.15 tons of volatile organic compounds, 0.59 tons of carbon monoxide, 0.98 tons of nitrogen oxide, 0.062 tons of particulate matter with a diameter ≤ 10 µm, and 0.00098 tons of sulfur dioxide. The permitted sources include a portable soil sorting system, facility maintenance shops, and generators.

## AIR QUALITY COMPLIANCE PROGRAM

Tonopah Test Range telemetry station



Bighorn sheep (Ovis canadensis)



The Chemical Information System for all Sandia locations 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 information system provides the chemical or product name, its location and quantity, and information about who is responsible for the chemical. Chemical hazards are reported on safety data sheets, and the Chemical Information System currently contains more than 127,000 safety data sheets in its library for use by any Sandia site. This electronic inventory helps chemical users and their managers assess and manage workplace hazards. Easy access to this inventory facilitates availability searches. It also improves the ability to share chemicals and thus reduces sources, which minimizes chemical purchases and waste disposal expenses.

#### **2022** Program activities and results:

In 2022, chemical containers at SNL/TTR were tracked along with information about any related chemical hazards.

## CHEMICAL INFORMATION SYSTEM





The Cultural Resource Management Program is focused 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. Cultural resources are places and physical evidence of past human activity: a site, an object, a landscape, a structure, or a natural feature of significance to a group of people traditionally associated with it.

#### **2022** Program activities and results:

Archaeological staff reviewed five outdoor projects at SNL/ TTR in 2022; no immediate archaeological concerns were found for any of the reviewed projects.

In 2022, DOE and Sandia hosted Nevada State Historic Preservation Division representatives at SNL/TTR to review and discuss archaeological and historic building questions related to a Programmatic Agreement. DOE and the Nevada State Historic Preservation Officer also completed a memorandum of agreement outlining mitigative actions for the demolition of Tower 02-00, which was part of the SNL/ TTR historic district. The required action to have the photos and drawings of Tower 02-00 reviewed prior to demolition was completed. DOE and Sandia personnel will proceed with developing a programmatic agreement in 2023.

### CULTURAL RESOURCE MANAGEMENT PROGRAM





Red-tailed hawk (Buteo jamaicensis)



Ecology Program personnel conduct project assessments to ensure compliance with wildlife regulations and laws and to support land use decisions. Ecological and wildlife awareness campaigns are conducted to ensure safe work environments and sustainable decision-making strategies.

#### **2022** Program activities and results:

Ecology Program personnel updated the avian survey protocol to better align with the North American Breeding Bird Survey and conducted a site visit to SNL/TTR. The avian surveys were conducted in June 2022. One hundred and nineteen birds from 13 species were recorded along the newly established survey routes. Horned larks *(Eremophila alpestris)* were the most recorded species during surveys. The second-most encountered species was the black throated sparrow *(Amphispiza bilineata)*. All other species encountered were at much lower numbers. Currently, no federally listed threatened or endangered species are known to be found at SNL/TTR.

## ECOLOGY PROGRAM





Pronghorn (Antilocapra americana)

## ENVIRONMENTAL RESTORATION OPERATIONS



Environmental restoration activities were initiated at SNL/ TTR and the Nevada Test and Training Range in 1980 to address contamination resulting primarily from nuclear weapons testing and related support activities. There are 70 Corrective Action Sites at SNL/TTR. A listing of Corrective Action Units/Corrective Action Sites is available in the Federal Facility Agreement and Consent Order. Active remediation is complete for all Corrective Action Sites at SNL/TTR.

#### **2022** Program activities and results:

The remaining Operation Roller Coaster monitoring equipment was removed in 2022. Operation Roller Coaster was conducted in May and June 1963 and subjected a series of four nuclear devices to chemical explosions, which resulted in plutonium dispersal in surrounding soils. The three Operation Roller Coaster test sites at SNL/TTR are referred to as Clean Slate I, Clean Slate II, and Clean Slate III. Post-closure monitoring at Tonopah Test Range Clean Slate I took place May 2011 through April 2017. The rest of the post-closure monitoring program was completed at the end of 2021, and the associated equipment was removed in January 2022.



Program personnel coordinate with DOE to ensure National Environmental Policy Act compliance and to provide technical assistance in project planning at SNL/TTR.

#### **2022** Program activities and results:

Program personnel reviewed six proposed projects and submitted two Request for Environmental Analysis (AF Form 813) forms on behalf of the DOE Sandia Field Office. Additionally, National Environmental Policy Act Program personnel prepared an environmental baseline survey to support a property transfer at SNL/TTR and partnered with SNL/TTR personnel and the Sandia Field Office to plan three coordination meetings with U.S. Air Force Nevada Test and Training Range personnel. This coordination resulted in improved alignment of environmental support activities and appropriate dual-agency oversight over the site's Coordinated Use Area.

## NATIONAL ENVIRONMENTAL POLICY ACT PROGRAM

Tonopah Test Range sunrise



Joshua tree (Yucca brevifolia)



The Oil Storage Program supports management, operation, and maintenance of oil storage containers and equipment at SNL/TTR to prevent spills or releases of oil that could potentially damage water resources, impact soil, or otherwise adversely affect the environment.

It was determined in 2019 that SNL/TTR oil storage facilities are not subject to regulation under 40 CFR 112, *Oil Pollution Prevention* (40 CFR 112 2011), because the location of all oil storage containers and equipment is within a hydrologically closed basin with no potential to impact waters of the United States. However, as a best management practice, SNL/ TTR personnel continue to inspect oil storage containers and equipment monthly to ensure functional operating conditions and to monitor for potential spills or releases to the environment.

### **2022** Program activities and results:

There were no reportable oil spills in 2022.

## OIL STORAGE PROGRAM





Historic missile launch at Tonopah Test Range

RADIONUCLIDE NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS



The Environmental Protection Agency tracks 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 set a maximally exposed individual radiological dose limit of 10 mrem/year resulting from all radiological air emissions produced from any DOE facility. Operations at SNL/TTR do not involve activities that release radioactive emissions from point sources (stacks and vents). However, diffuse radiological emissions historically were produced from the resuspension of americium, plutonium, and other radionuclides from the Clean Slate environmental restoration sites.

#### **2022** Program activities and results:

Active remediation is complete on the Clean Slate environmental restoration sites, and no activities that would produce radionuclide air emissions were undertaken in 2022. In September 2020, transfer of SNL/TTR environmental restoration sites from DOE Office of Environmental Management to DOE Office of Legacy Management was completed. The Office of Legacy Management assumed responsibility for the long-term surveillance and maintenance of these sites on September 30, 2020.



![](_page_13_Picture_0.jpeg)

Wild horse (Equus ferus)

### TERRESTRIAL SURVEILLANCE PROGRAM

![](_page_13_Picture_4.jpeg)

Terrestrial Surveillance Program personnel collect environmental media (soil) samples annually, which are analyzed for radiological constituents, as required. As a best management practice, samples are also collected to analyze metals. Terrestrial surveillance began at SNL/TTR in 1992.

In addition to the environmental media samples collected, ambient external gamma radiation levels are measured using environmental dosimeters. These surveillance activities are conducted at designated locations that are on-site, off-site, and around the perimeter of SNL/TTR. Dosimeters are exchanged quarterly.

#### **2022** Program activities and results:

Analyses of the 2022 results for the selected radionuclides revealed no statistically significant population differences nor any increasing trends in the on-site location sample results. The analysis for metals identified one instance of statistical significance (population difference and increasing trend) for beryllium at on-site location S-10. The result is below the U.S. Environmental Protection Agency regional screening level for residential use and is within Nevada regional soil concentrations for beryllium.

In 2022, dosimeter data indicated that average annual dose rates were higher than the established non-urban Nevada value of 71 mrem/year. The difference may be attributed to a variety of elevations, proximity to bedrock, and the spontaneous nature of radioactivity.

![](_page_13_Picture_10.jpeg)

Navarro Research and Engineering manages all waste generated at SNL/TTR—which excludes any waste generated by environmental restoration activities—under the Waste Management Program. Waste categories include radioactive waste, Resource Conservation and Recovery Act hazardous waste, other chemical waste, and nonhazardous solid waste. Waste minimization and recycling efforts are integrated into Waste Management Program activities.

#### **2022** Program activities and results:

In 2022, the following waste was generated: regulated waste not regulated by the Resource Conservation and Recovery Act (643 kg), recycled materials (319,973 kg), hazardous waste regulated by the Resource Conservation and Recovery Act (91 kg), asbestos waste (1,836 kg), and polychlorinated biphenyl waste (32 kg). Site personnel shipped hazardous waste and other regulated waste off-site to permitted facilities. Waste shipped in 2022 included 67,668 kg of construction debris sent to the U.S. Air Force Construction Landfill, 12,773 kg of sanitary landfill waste sent to the U.S. Air Force Sanitary Landfill, and 14,282 kg of tires sent to Lunas Tire Recycling. Recyclables and used oil are sent for recycling or are disposed of through a waste disposal contractor. In total, 319,973 kg of material was recycled or energy-recovered and shipped off-site in 2022. There were no radioactive waste shipments in 2022.

WASTE MANAGEMENT PROGRAM

Western fence lizard (Sceloporus occidentalis)

![](_page_15_Picture_0.jpeg)

![](_page_15_Picture_1.jpeg)

Historic Property at TTR by Craig Fritz

The Water Quality Program includes drinking water, release reporting, septic tank systems, stormwater, wastewater, and water conservation. The current SNL/TTR water conservation plan was revised in November 2020 and was approved by the State of Nevada Department of Conservation and Natural Resources, Division of Water Resources on February 17, 2021. The SNL/TTR water conservation plan provides education, conservation measures, and supply management guidance. The next plan revision is due by February 17, 2026.

#### **2022** Program activities and results:

In 2022, no releases to the environment occurred that required reporting to the Nevada Department of Environmental Protection or any outside agency.

Site personnel routinely sample the public water system and analyze it to demonstrate conformance with primary drinking water standards. There were no exceedances of water quality standards in 2022. Four arsenic compliance samples were collected from the Area 3 distribution system for analysis in 2022. The maximum contaminant level for arsenic in drinking water is 10 parts per billion as a running annual average. The running annual average for arsenic in the drinking water at SNL/TTR during the fourth quarter of 2022 was 4.55 parts per billion. There were two precautionary Boil Water Notices issued for the SNL/TTR public water system in 2022.

In October 2021, the Nevada Division of Environmental Protection conducted a sanitary survey of the SNL/TTR public water system. On December 30, 2021, one significant deficiency related to corrosion on piping in the well pumphouse and five other deficiencies related to administrative or system design considerations were noted. In 2022, Sandia personnel actively worked with engineers as per the proposed path forward that the DOE Sandia Field Office sent to the Nevada Division of Environmental Protection.

![](_page_15_Picture_8.jpeg)

## WATER QUALITY PROGRAM

![](_page_16_Picture_0.jpeg)

![](_page_16_Picture_1.jpeg)

Blacktop installation

Sandia currently controls two septic tanks; the septic tank at Station 24 has been out of service for several years, and the septic tank located at 09-52 was never placed in service. On October 6, 2022, Nevada Division of Environmental Protection Bureau of Water Pollution Control personnel inspected the 09-52 septic tank and verified that it was in an inactive state.

The State of Nevada has determined that there are no industrial activities at SNL/TTR that require stormwater permitting. New construction activities that exceed one acre of soil disturbance and lie outside the boundaries of the closed basin require permitting under the construction general permit. During 2022, no construction projects required Construction General Permit coverage at SNL/TTR.

As a best management practice, Sandia personnel sample Area 3 wastewater annually at the point where wastewater leaves SNL/TTR property and enters the U.S. Air Force system. Twenty-four-hour composite wastewater samples are collected annually; during 2022, there were no excursions or violations of concentration limits.

# WATER QUALITY PROGRAM (CONTINUED)

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![](_page_17_Picture_0.jpeg)

![](_page_17_Picture_1.jpeg)

![](_page_17_Picture_2.jpeg)

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