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ANNUAL SITE ENVIRONMENTAL REPORT SUMMARY PAMPHLET

FOR

Sandia National Laboratories,

Sandia National Laboratories

U.S. DEPARTMENT OF ENERGY

National Nuclear Security Administration

Sandia National Laboratories is a multi-mission laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000

INTRODUCTION

Sandia National Laboratories (SNL) is one of the nation's multiprogram national security laboratories. The U.S. Department of Energy (DOE)/ National Nuclear Security Administration (NNSA)/Sandia Field Office (SFO) oversees contractor operations at the SNL, New Mexico (SNL/NM) site.

Sandia Corporation's (Sandia's) enduring core mission is to provide science and engineering support for the nation's nuclear weapons stockpile. Today, the mission encompasses additional critical aspects of national security, including developing technologies and strategies for responding to emerging threats, protecting and preventing the disruption of critical infrastructures, and supporting the nonproliferation of weapons of mass destruction. Sandia also collaborates with representatives from other government agencies, the industrial sector, and universities to develop and commercialize new technologies. Information about recent technologies developed at SNL/NM can be found at:

http://www.sandia.gov/news/index.html

The DOE/NNSA/SFO and Sandia are committed to protecting the environment and preserving the health and safety of Sandia employees and the public. This Annual Site Environmental Report (ASER) Summary Pamphlet is published in response to the community's desire for a document that summarizes annual environmental activities at SNL/NM. For additional technical information and monitoring results at SNL/NM, we encourage you to view an online copy of the 2014 ASER at:

http://www.sandia.gov/news/publications/environmental_reports/

This ASER Summary Pamphlet presents the environmental protection, restoration, and monitoring programs in place at SNL/NM during calendar year 2014. It also discusses Sandia's compliance with environmental regulations, and it highlights significant environmental program efforts and accomplishments. The environmental programs and waste management activities at Sandia meet or exceed the requirements of federal, state, and local environmental regulations, as well as DOE directives in the Prime Contract between Sandia and DOE. This document, prepared in accordance with and as required by DOE Order 231.1B, Environment, Safety, and Health Reporting, is a key component of DOE's efforts to keep the public informed about environmental conditions throughout the DOE/NNSA nuclear weapons complex.

We hope that you will find the following material informative and interesting. We appreciate feedback from the community, and invite you to ask questions or offer suggestions about what you would like to see in next year's Summary Pamphlet by contacting:

U.S. Department of Energy
National Nuclear Security Administration
Sandia Field Office
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Albuquerque, NM 87185-5400
Attention: Karen Agogino

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Indian paintbrush

SNL/NM is located on Kirtland Air Force Base (KAFB) in Albuquerque, New Mexico (Figure 1). New Mexico is the fifth-largest state in the U.S., comprising approximately 121,000 square miles. Based on recent U.S. Census Bureau projections, New Mexico's estimated 2014 population was 2,085,572. Albuquerque is the largest city in the state, with approximately 556,495 residents. The estimated population within a 50-mile radius of SNL/NM's zip code is approximately 962,058 residents. Nine counties are contained or partially included in that radius (Figure 2).

KAFB is a military installation that spans 51,559 acres, including 20,486 acres that are withdrawn from the Cibola National Forest through an agreement with the U.S. Forest Service. Located at the foot of the Manzanita Mountains, KAFB has a mean elevation of 5,384 feet and a maximum elevation of 7,986 feet. KAFB is host to more than 450 federal government and private sector tenants and associate units. KAFB and SNL/NM are adjacent to Albuquerque, which borders KAFB on its north, northeast, west, and southwest boundaries. The Albuquerque International Sunport (airport) and Mesa del Sol—a 12,800-acre mixed-use urban area under development—are west of KAFB. Isleta Pueblo is located south of the KAFB boundary.

Operations

SNL operations are conducted on DOE-owned property assigned for operational use, non-DOE-owned property contracted from other federal agencies, and privately owned leased property. SNL sites located on DOE-owned property comprise 2,938 acres and include five technical areas (Figure 1). For non-DOE-owned property, Sandia conducted operations on 5,637 acres of land permitted from the U.S. Air Force, a portion of which are on land withdrawn from the U.S. Forest Service. DOE leases approximately 2,750 acres from the New Mexico State Land Office (La Semilla Buffer Zone) west of the KAFB boundary. This area serves as a margin of safety and a sound buffer for testing operations. In addition, Sandia conducts operations at off-site leased facilities.

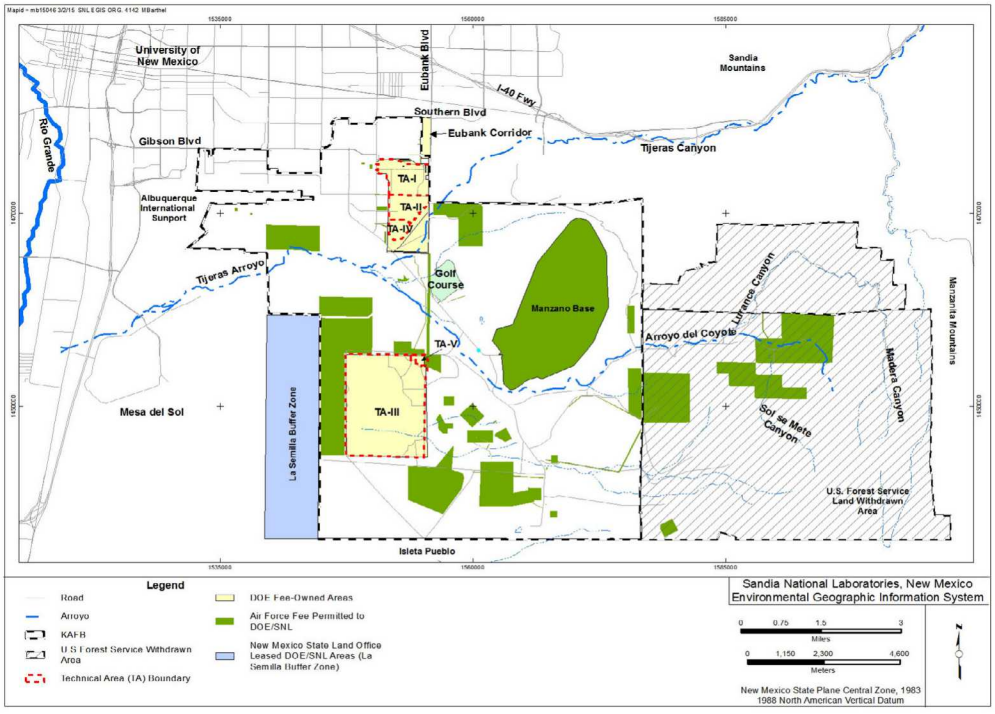


Figure 1. SNL/NM technical areas and the U.S. Forest Service land withdrawn area

SNL/NM consists of five DOE fee-owned secured technical areas; buildings and structures in non-secured leased areas; and several remote testing areas, which are also on leased land. These remote test areas are collectively known as the Coyote Test Field and are located in the canyons on the west side of the Manzano Mountains. In 2014, the total workforce at SNL/NM was approximately 10,536, and the New Mexico location has approximately 6.58 million gross square feet of existing facilities.

Environmental Setting

SNL/NM is set in the high desert region in central New Mexico. The mountains on the east and plains on the west create a diverse range of geological, hydrological, ecological, and climatic settings. The most prominent topographic feature in the Albuquerque region is the Sandia Mountains, which form an impressive backdrop to the east of Albuquerque and KAFB. The Sandia Mountains form a 13-mile-long escarpment distinguished by steep cliffs, pinnacles, and narrow canyons; the tallest point is Sandia Crest at 10,678 feet. At sunset, the Sandia Mountains are often bathed briefly in a pinkish glow, which is how they got their name (*sandia* is Spanish for "watermelon").

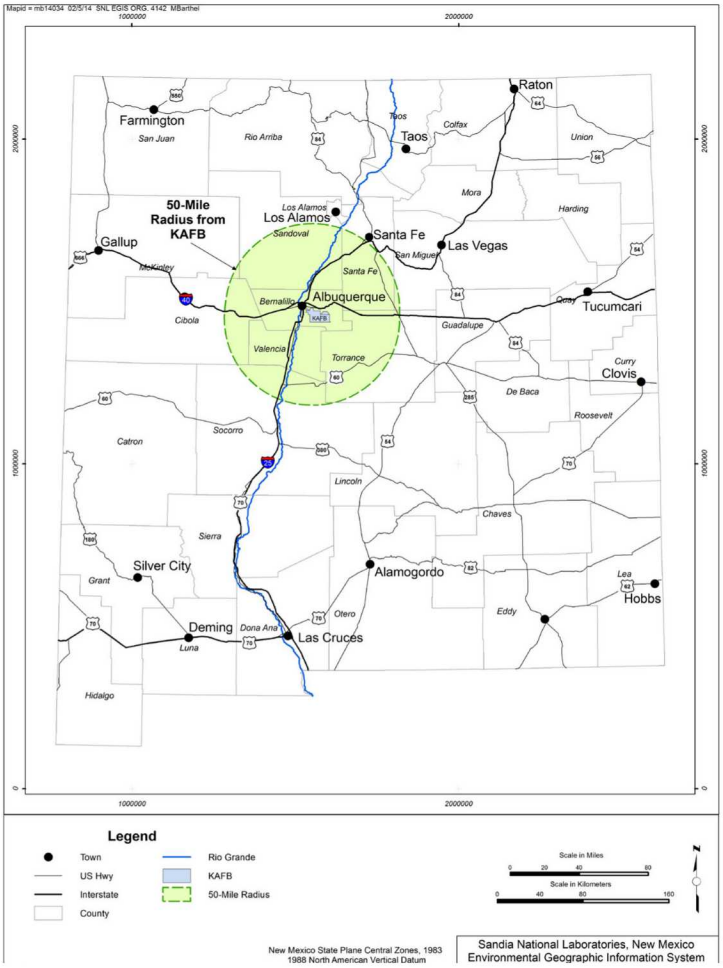
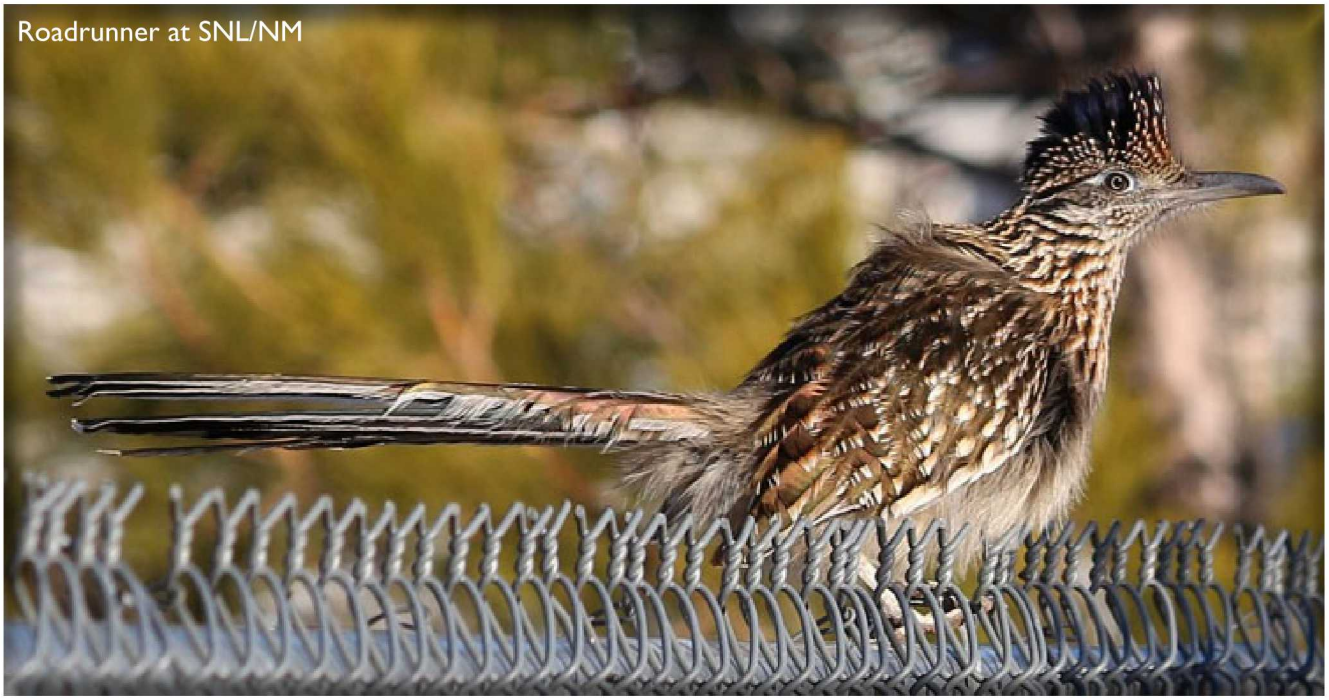


Figure 2. State of New Mexico


Roadrunner at SNL/NM

Environmental Programs

The environmental programs and waste management activities at Sandia meet or exceed the requirements of federal, state, and local environmental regulations, as well as DOE directives in the Prime Contract between Sandia and DOE. While all 2014 program activities were performed continuously, they are reported in this ASER on a calendar year basis unless noted otherwise (programs based on the fiscal year operate from October 1 through September 30, annually).

Environmental Management System Program

DOE Order 436.1, *Departmental Sustainability*, was established to ensure that the Environmental Management System (EMS) and site sustainability are at the forefront of environmental excellence. At Sandia, the intent of this order is implemented for an ISO 14001-certified EMS. SNL/NM and SNL, California received initial ISO 14001 certifications in June 2009 and September 2006, respectively, with recertification occurring every three years. These independent certifications will be combined in 2015 to streamline Sandia's processes and maximize the efficient use of corporate resources.

Sandia has multiple environmental aspects and impacts across its mission areas. An environmental *aspect* is defined as an element of Sandia's activities, products, or services that can interact with the environment. An environmental *impact* is defined as any change to the environment, whether adverse or beneficial, wholly or partially, resulting from Sandia's activities, products, or services.

Sandia's EMS has a process in place to evaluate what aspects and impacts relate to specific activities and how they may interact with the environment. The EMS coordination team and appropriate subject matter experts review these aspects and impacts annually. For fiscal year 2014, the top three significant aspects were natural resource use, hazardous materials, and hazardous waste.

When significant aspects and negative impacts have been identified, Sandia establishes objectives and measurable targets—at both the division and corporate levels—which helps efforts toward minimizing those aspects and impacts. Sandia's management tracks and reviews this progress. Additional information can be found on Sandia's external EMS website:

www.sandia.gov/about/environment/index.html

Site Sustainability Plan

Sandia defines its sustainability strategies and goals in its annual Site Sustainability Plan (SSP), and many of these efforts have been adopted as EMS corporate objectives and targets. Each DOE site is required to prepare an annual SSP that articulates the site's performance status and planned actions for meeting DOE's Strategic Sustainability Performance Plan goals and broader sustainability program. Sandia uses its EMS as a platform for SSP implementation, as well as for other programs with objectives and measurable targets that contribute to meeting sustainability goals. As of fiscal year 2014, Sandia is meeting or exceeding sustainability goals in several key areas, including the following:

- Reduce Scope 1 and Scope 2 greenhouse gas emissions.
- Reduce energy and potable water intensity.
- Improve Energy Independence and Security Act, Section 432, energy and water evaluations.
- Reduce fleet petroleum consumption.
- Purchase light-duty alternative fuel vehicles.
- Divert nonhazardous solid waste and construction and demolition debris.
- Purchase electronics that meet Electronic Product Environmental Assessment Tool standards.
- Use energy from renewable sources.

Sandia's Environmental Life-Cycle Management (ELM) Program provides environmental stewardship for past, present, and future activities. The ELM Program's purpose is to promote the long-term stewardship of a site's natural and cultural resources throughout its operational, closure, and post-closure life cycle.

The ELM Program's mission ensures long-term protection of human health and the environment, and proactive management toward sustainable use and protection of natural and cultural resources affected by Sandia's operations and operational legacies. This mission will be accomplished by identifying potential environmental impacts and applying environmental processes and guidance.

The ELM Program's objectives are to do the following:

- Protect human health and the environment from past, present, and future operations
- Preserve and protect natural and cultural resources
- Apply life-cycle cost principles to environmental impacts of SNL operations

Using Sandia's National Environmental Policy Act (NEPA) process, the ELM Program reviews all proposed projects and activities that have the potential to impact the environment.


Mule deer at SNL/NM

Sandia's Environmental Restorations (ER) 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 the Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments (HSWAs). HSWA requirements apply to ER Operations sites that include Solid Waste Management Units (SWMUs)or Areas of Concern (AOCs). Additional AOCs at SNL/NM that are not regulated as SWMUs have been investigated as part of ER Operations. These AOCs were not identified at the time of issuance of the HSWA Module of the RCRA Part B Operating Permit (Permit NM5890110518-1 [the Permit]); however, they were identified by the New Mexico Environment Department (NMED) as requiring investigation.

Sandia, DOE, and NMED signed a Compliance Order on Consent (the Order) in 2004. The Order governs corrective action for releases of hazardous waste or hazardous constituents at SNL/NM. The Order will terminate upon the completion of its requirements, and the Permit will remain as the enforceable document.

Waste Cleanup and Site Closures

The initial identification of ER sites at SNL/NM was completed in 1987. At that time, 117 sites were identified under Sandia's jurisdiction in the initial *Comprehensive Environmental Assessment and Response Program (CEARP) Phase I: Installation Assessment*; those sites at SNL/NM were also identified in subsequent years and were incorporated into the list of sites that were subject to the RCRA corrective action requirements in Module IV of the Permit.

Since then, approximately 500 individual sites, potential sites, or individual historical activities have been identified for investigation. Many of these sites were confirmed to contain little or no contaminants of concern. In 1992, the ER Project (now Operations) at SNL/NM was officially initiated to implement assessment and remediation activities for sites that had been contaminated or potentially contaminated because of past SNL/NM operations.

Corrective Action Complete Status

DOE and Sandia propose ER sites to NMED for Corrective Action Complete (CAC) status when they meet NMED criteria, either before or after remediation. The criteria include acceptable levels of risk to human health and the environment presented by the contaminants at the site.

After NMED grants CAC status to an ER site, DOE and Sandia submit a request for a Class III modification to Module IV of the Permit. The majority of ER sites are granted CAC status under a risk-based scenario. Risks to human health and the environment are calculated for sites with residual contamination according to Environmental Protection Agency (EPA) and NMED guidelines. The remaining level of contamination and the appropriate land-use category (i.e., industrial, residential, or recreational use) are combined with the available information and conceptual model for each site to determine the risk to human health and the environment.

The 2014 status of the ER Operations site closure is as follows:

- At the beginning of 2014, 278 SNL/NM SWMUs/AOCs no longer required corrective action, and 35 SWMUs/AOCs required corrective action.
- As stated in letters from the NMED in 2010 and 2012, 5 of the 35 remaining SWMUs/AOCs required groundwater monitoring as part of the corrective action. SWMUs 8, 58, 68, 149, and 154 required eight quarters of groundwater monitoring, and these requirements were met in 2014.
- Twenty-three SWMUs/AOCs were proposed for grant of CAC in conjunction with renewal of the Permit for SNL/NM. On December 19, 2014, NMED signed a Final Order issuing the Permit and granting CAC status at all 23 SWMUs/AOCs.

At the end of 2014, only 12 ER Operations sites require corrective action, including:

- Three groundwater AOCs: Technical Area (TA)-V Groundwater, Tijeras Arroyo Groundwater, and Burn Site Groundwater have final remedies pending.
- Three SWMUs at active test facilities: SWMU 83, 84, and 240 have potential soil contamination that will be evaluated at the end of their test operations.
- Five SWMUs suitable for CAC: SSWMUs 8, 58, 68, 149, and 154 have met NMED groundwater monitoring requirements and will now be proposed for CAC.
- The Mixed Waste Landfill: NMED issued a Certification of Completion verifying that corrective action is complete for this SWMU.

Mixed Waste Landfill Activities

Sandia's Mixed Waste Landfill (MWL) is a 2.6 acre SWMU located in the north-central part of TA-III, which is undergoing corrective action in accordance with Module IV of the Permit and the Order. From March 1959 through December 1988, the MWL received approximately 100,000 cubic feet of low-level radioactive waste and minor amounts of mixed waste generated at SNL/NM research facilities. Groundwater, which is approximately 500 feet below ground surface at the MWL, has been monitored since 1990. More than 20 years of data indicate that groundwater has not been contaminated by the MWL.

A Phase 2 RCRA Facility Investigation was conducted from 1992 to 1995 and confirmed that tritium was the primary contaminant of concern (COC) at the MWL. As directed by NMED, the MWL Corrective Measures Study Report was submitted to NMED in May 2003. Following a public comment period, on May 26, 2005, the Secretary of NMED issued a Final Order on the MWL, which included the requirement for a vegetative cover with a biointrusion barrier (i.e., an evapotranspirative cover). The MWL Evapotranspirative Cover construction was completed in 2009, and NMED approved the MWL Corrective Measures Implementation Plan on October 14, 2011.

MWL Evapotranspirative Cover

The Long-Term Stewardship (LTS) Program's mission is the long-term protection of human health and the environment from hazards associated with residual contamination at legacy sites, and minimization of Sandia's environmental liability by ensuring compliance with the environmental requirements provided in multiple NMED permits. Stewardship of legacy sites (former ER sites) is necessary to maintain long-term protection of human health, the environment, and natural and cultural resources from hazards associated with residual radioactivity and hazardous contamination. Sandia's LTS activities are increasing as remedial activities are completed. The LTS Program conducts compliance oversight, institutional control, and community liaison and stakeholder-involvement activities. LTS compliance oversight activities include groundwater monitoring and various types of monitoring at the Chemical Waste Landfill (CWL), the MWL, and the Corrective Action Management Unit (CAMU) to meet NMED regulatory requirements.

Groundwater Monitoring

Groundwater monitoring at SNL/NM consists of monitoring a network of approximately 78 groundwater-monitoring wells for the presence of constituents of concern at various intervals during the year. Sixty-six of these wells are associated with legacy sites and are monitored to meet NMED requirements. An additional 12 wells and a spring are sampled to assess SNL/NM operations impacts on groundwater. Water level measurements are obtained from 96 SNL/NM wells and approximately 80 additional wells owned by other agencies. Monitored wells are maintained or replaced as necessary.

Sandia personnel collect groundwater samples at six project areas: CWL, MWL, TA-V Groundwater, Tijeras Arroyo Groundwater, Burn Site Groundwater, and miscellaneous SWMUs. The 2014 water quality results for these six areas were consistent with results from past years. The LTS Program conducts long-term monitoring of the CAMU containment cell as required by NMED.

All 2014 groundwater monitoring activities, analytical results, hydrographs, and contour maps are provided in the *Annual Groundwater Monitoring Report, Calendar Year 2014*, available as an attachment in the 2014 ASER.

Corrective Action Management Unit

The CAMU is a containment cell located in TA-III and is permitted under RCRA. It was engineered to hold treated soil wastes generated from the excavation of the CWL. The CAMU containment cell consists of engineered barriers and a final cover system, and incorporates a bottom liner system with a leachate collection system and a vadose zone monitoring system.

In 2014, 336 gallons of leachate (a listed hazardous waste) were removed from the collection system. Leachate is pumped from the containment cell leachate collection system on a weekly basis, containerized, characterized, and then transported to the Hazardous Waste Handling Unit (HWHU) and subsequently shipped to an off-site hazardous waste facility for analysis and treatment.

The 2014 soil vapor monitoring results indicate an influence from the residual soil vapor plume emanating from the location of the former CWL. This is consistent with the conceptual model of the CWL residual soil vapor plume. Volatile organic compound (VOC) concentrations at monitoring locations continue to correlate with soil temperature variations, increasing when the soil temperature is warmer and decreasing when soil temperature is cooler. The VOC concentrations are not attributed to the material in the CAMU containment cell.

Chemical Waste Landfill

The CWL is a remediated, closed, regulated unit undergoing post-closure care in accordance with the CWL Post-Closure Care Permit (PCCP). The site is approximately two acres and is located in the southeast corner of TA-III. From 1962 through 1985, the CWL was used for disposal of hazardous wastes, chemicals, solid wastes, and minor amounts of radioactive wastes generated by SNL/NM research activities. Liquid waste disposal ended in 1982.

The groundwater monitoring network at the CWL consists of four wells. In 2014, CWL groundwater monitoring was performed in January and July (two semiannual sampling events) in accordance with CWL PCCP requirements. No analytes were detected at concentrations exceeding the EPA maximum contaminant levels.

The 2014 soil-gas monitoring results continue to indicate the residual VOC soil-gas plume beneath the CWL is slowly dissipating in the vadose zone. Evapotranspirative Cover maintenance activities (i.e., weed removal, seeding, discrete application of herbicides, and supplemental watering) were performed from April through October 2014.

The CWL Evapotranspirative Cover continues to meet PCCP-defined criteria for successful revegetation. Only minor repairs were required based upon inspections of the Evapotranspirative Cover, stormwater diversion structures, compliance monitoring system (groundwater and soil-gas monitoring wells and sampling equipment), and security fence. All PCCP-required monitoring, inspection, and maintenance and repair requirements were met for 2014.

Institutional Controls

Administrative and physical institutional controls are in place at SNL/NM to appropriately limit access to and use of legacy sites. Legacy sites are inspected periodically and are maintained when necessary. A total of 18 site inspections were conducted in 2014. Signs needed minor repairs at six SWMUs and AOCs; two repairs were completed in 2014, and the remaining four repairs will be completed in early 2015.

Community Liaison and Planning, and Stakeholder Involvement

It is important that the public be made aware of the work Sandia conducts to maintain long-term protection of human health, the environment, and natural and cultural resources from hazards associated with residual radioactive and hazardous contamination at legacy sites. Stakeholders participate in semiannual DOE/U.S. Department of Defense joint meetings on environmental activities. Regulatory decision documents for legacy sites are available to the public in the local federal repository (the University of New Mexico's Zimmerman Library) and in its electronic documents Lobo Vault collection:

http://repository.unm.edu/handle/1928/10963

Additional 2014 Long-Term Stewardship Activities

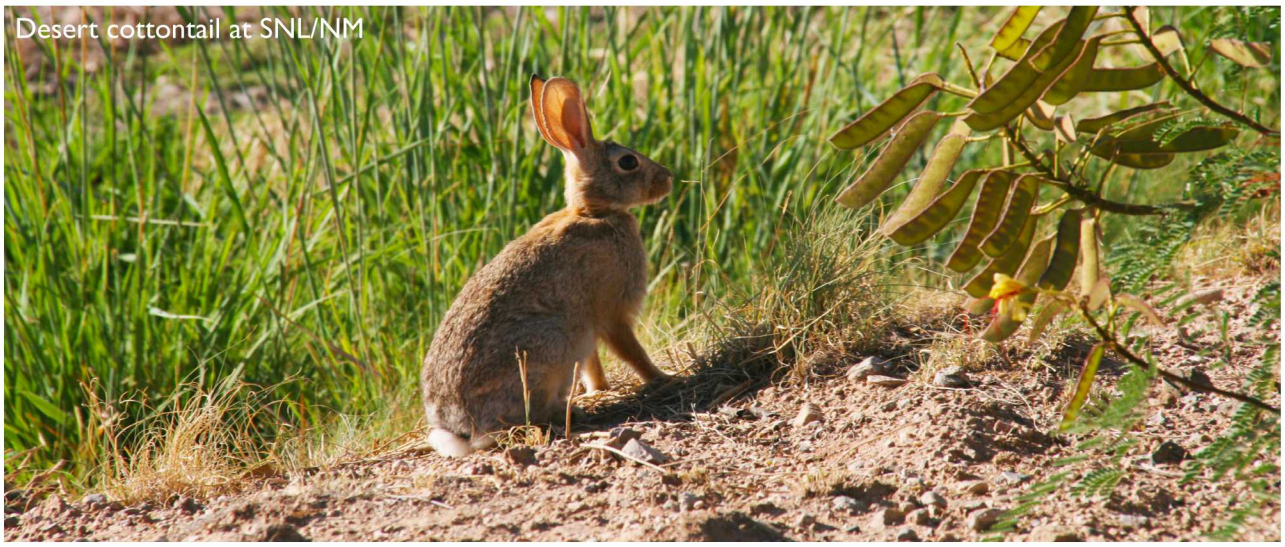
A Voluntary Corrective Action (VCA) was planned and conducted at SWMU 502 in 2013 to address a remediation initiative. The VCA included completion of a site assessment along with surface and subsurface soil sampling. Soil samples were analyzed for high-explosive compounds, perchlorate, Target Analyte List metals, VOCs, semivolatile organic compounds, and nitrite plus nitrate.

Based upon field investigation results, a determination of CAC without controls is recommended for SWMU 502 based on the following criteria:

- No COCs are present in the soil at levels considered hazardous to human health for either an industrial or residential land-use scenario.

- No COCs warrant ecological concern because ecological risks were acceptable per NMED guidance.

Details can be found in the *Investigation Report for VCA at SWMU 502 Building 9938 Surface Discharge Site* submitted to NMED in October 2013. Final determination by NMED is pending.


Desert cottontail at SNL/NM

Ecology Program

The Ecology Program monitors biota at SNL/NM as an element of the overall environmental monitoring process. Ecology Program personnel collect ecological resource data on plants and wildlife to support documentation, land use decisions, and ecological and wildlife awareness campaigns to ensure safe work environments and sustainable decision making-strategies. Table 1 lists the common animals found on KAFB. No data on wildlife has been collected with respect to contaminant radionuclides and metals since 2001, as no significantly elevated levels of radionuclides or metals have been observed in soil or vegetation samples taken by the Terrestrial Surveillance Program.

Table 1. Common bird, mammal, and reptile species found on KAFB

Birds	American Kestrel	House finch	Dark-eyed Junco	Killdeer	Mountain Bluebird	Spotted Towhee
	Black-chinned Hummingbird	Broad-tailed Hummingbird	Horned Lark	Loggerhead Shrike	Red-tailed Hawk	Ladder-backed Woodpecker
Mammals	Black bear	Banner-tailed kangaroo rat	Desert cottontail	Gunnison's prairie dog	Mule deer	
	Bobcat	Black-tailed jackrabbit	Deer mouse	Gray fox	Silky pocket mouse	
Reptiles	Collared lizard	Long-nosed snake	Gopher snake	New Mexico spadefoot toad	Side-blotched lizard	
	Chihuahuan spotted whiptail	New Mexico whiptail	Great Plains skink	Western diamondback rattlesnake	Short-horned lizard	

National Environmental Policy Act Program

The SNL/NM NEPA Program provides the DOE/NNSA/SFO with technical assistance in support of Sandia's compliance with NEPA and the National Historic Preservation Act at all of Sandia's locations. The Sandia NEPA team reviewed a total of 1,280 proposed projects in various corporate systems. To support mission activities, 88 DOE NEPA checklists were transmitted to the DOE/NNSA/SFO for review and determination.


Gray fox

Sandia undertook two archaeological assessments in 2014. One supported the installation of fiber-optic cable, and the second was the result of bar ditch damage near previously identified archaeological sites.

Also in 2014, Sandia personnel assisted the DOE in the continued development of a new Site-Wide Environmental Impact Statement. As needed, Environmental Programs personnel conferred with experts from various Sandia programmatic missions to review and clarify data on their current and anticipated future operations.

Environmental Education Outreach Program

Sandia's Environmental Education Outreach Program reaches out to the community through various events and provides environmental information to Sandia's personnel. Sandia recognizes that in addition to complying with requirements, it is important to communicate with personnel and the local community to help reduce environmental impacts at work and at home. Sandia has an integrated approach to communicating environmental awareness to its personnel via various newsletters, awareness campaigns, and outreach events. Sandia also collaborates with numerous external organizations, such as the City of Albuquerque (COA) and the Environmental Education Association of New Mexico.

Currently, Sandia participates in or holds several internal and external outreach and awareness events annually. Events conducted in 2014 included the Annual Youth Conference on the Environment and the annual EMS Excellence Awards Program. Sandia also coordinates the semiannual DOE Public Meeting. At these events, the outreach team distributes fact sheets and newsletters. When working with children, the team often demonstrates environmental education models on topics such as local air quality, landfills, groundwater, and watersheds. The outreach team encourages personnel and the community to provide feedback and to ask questions about Sandia's environmental programs.

Annual Youth Conference on the Environment

The Annual Youth Conference on the Environment is a free, one-day conference offered to high school students as a means to educate them on various environmental issues. In 2014, approximately 160 students attended the conference and learned about urban farming, water conservation, and composting. Sandia, the Environmental Education Association of New Mexico, and the COA sponsored the event.

Environmental Management System Excellence Awards Program

The annual EMS Excellence Awards Program recognizes personnel who demonstrate environmental excellence in areas such as energy and water conservation, environmental protection, waste minimization, and recycling. Since its inception in 2006, the EMS team has received 217 nominations for individuals and teams that are contributing to Sandia's vision of environmental excellence.

Gopher snake

Chemical Information System and Chemical Exchange Program

The Chemical Information System is a comprehensive chemical information management tool that tracks workplace chemical containers and provides an inventory control and safety management system. The information helps chemical users and their managers assess and manage workplace hazards. A Safety Data Sheet library currently contains over 110,000 Safety Data Sheets. ChemPro, an acquisition request module, was added to improve chemical management by requiring approval to purchase chemicals.

The Chemical Exchange Program (CEP) has been through multiple transformations since its inception, and in 2008 it was introduced as a module within the Chemical Information System. The CEP was developed to reduce the amount of usable chemicals disposed of as waste and instead make them available for reuse, lowering the cost for both new acquisitions and disposals. In 2014, the CEP delivered 54 pounds of excess chemicals to new users.

The Materials Sustainability and Pollution Prevention (MSP2) Program provides assessment, guidance, and assistance to the workforce at SNL/NM to implement measures that reduce resource use, reduce generated waste, and enhance the overall efficiency of processes and organizations within SNL/NM. Additionally, the MSP2 Program works with several facilities to investigate or initiate new recycling avenues for certain waste streams.

Waste Management Units

Waste at SNL/NM is managed at several units: the HWHU, the Radioactive and Mixed Waste Management Unit, the Auxiliary Hot Cell Unit, the Thermal Treatment Unit, five Manzano Storage Bunkers, and the Solid Waste Collection and Recycling Center (SWCRC). In addition, the SNL/NM Reapplication Yard recycles surplus material and equipment that cannot be reapplied, sent for auction, or donated to kindergarten through twelfth-grade schools. Table 2 provides a list of waste shipped by SNL/NM waste management facilities during 2014. Table 3 lists waste recycled by SNL/NM in 2014.

Table 2. Waste shipped by SNL/NM waste management facilities, 2014

Waste Categories	2014 Waste Shipped (kilograms)	2014 Waste Shipped (pounds)
Radioactive Waste		
Low-level radioactive waste	27,370	60,339
Transuranic waste	0	0
Subtotal	**27,370**	**60,339**
Mixed Radioactive and Hazardous Waste		
Mixed low-level waste	74,561	164,377
Mixed transuranic waste	0	0
Subtotal	**74,561**	**164,377**
Resource Conservation and Recovery Act		
Hazardous waste	60,816	134,074
Subtotal	**60,816**	**134,074**
Toxic Substances Control Act		
PCBs	899[a]	1,981
PCBs and hazardous waste mixture	0	0
Subtotal	**899**	**1,981**
Other Regulated Wastes		
Infectious waste	781	1,722
Asbestos	16,593	36,580
Chemical waste (includes special waste and industrial solid waste)	243,027	535,778
Used oil (not recycled)	9,666	21,309
Subtotal	**270,067**	**595,389**
Commercial Solid Waste		
Solid waste collection and recycling center dry waste	635,520	1,401,067
Off-site office waste (Sandia Science and Technology Park)	50,440	111,200
Cafeteria wet waste	19,940	43,960
Construction and demolition waste	510,000	1,124,346
Subtotal	**1,215,900**	**2,680,573**
2014 Total Waste Shipped	**1,649,613**	**3,636,733**

NOTES: All wastes were shipped off-site for treatment and/or disposal unless noted otherwise.
Wastes that were treated on-site and shipped off-site are included in the quantities of wastes shipped off-site. Waste treatment may increase waste quantity (e.g., adding inert material to treat the waste through macroencapsulation within an outer container).
Waste containers are included in the quantities of wastes shipped off-site, and some containers (e.g., containers with lead shielding for radiation protection) may significantly increase the quantity.
[a] The weight shown includes the weight of the PCB-containing equipment
PCB = polychlorinated biphenyl

Table 3. Waste recycled by SNL/NM, 2014

Recycle Categories	Waste Recycled	
	(kilograms)	(pounds)
Regulated or Chemical Waste Recycled		
Batteries	41,784	92,117
Capacitors	2,394	5,278
Computer electronics	236,691	521,808
Lead	1,332	2,937
Light ballasts (non-PCB)	4,776	10,529
Lightbulbs	10,718	23,630
Mercury-containing items	808	1,781
Oil, grease, and fuel	33,735	74,372
Refrigerant	17	37
Soil	426	939
Toner and ink cartridges	10,044	22,143
Subtotal	**342,725**	**755,571**
Commercial, Construction, and Demolition Solid Waste Recycled		
Asphalt	4,210,993	9,283,423
Batteries	1,234	2,720
Binder exchange program	484	1,067
Cardboard	171,124	377,260
Chairs	22,526	49,660
Compost (food, green, paper, plywood, and gypsum)	114,791	253,069
Concrete	2,382,461	5,252,374
Fencing	617	1,360
Food grease	2,359	5,200
Frito-Lay snack bags	22	49
Gravel	54,432	120,000
Metals	871,707	1,921,766
Paper (mixed and white)	123,573	272,428
Plastics	13,836	30,503
Solar panels	886	1,953
Tires	8,709	19,200
Wood	28,087	61,920
Subtotal	**8,007,841**	**17,653,952**
2014 Total Waste Recycled	**8,350,566**	**18,409,523**

NOTES: PCB = polychlorinated biphenyl

All low-level radioactive waste, mixed waste, transuranic waste, and mixed transuranic waste generators are instructed to contact the Radioactive Waste Program to obtain approval before generating waste; this promotes waste minimization and allows a pathway to be developed for waste treatment and disposal before the waste is generated. Radioactive wastes are typically shipped to off-site facilities within one year, but may remain on-site longer than one year if necessary to complete the process for acceptance at an off-site facility and/or to achieve full utilization of transport vehicles.

Hazardous waste generated at SNL/NM includes a wide variety of wastes from research and testing, together with larger quantities of wastes from decontamination and demolition, production, maintenance, and support operations, including waste management activities. Hazardous wastes that cannot be recycled or treated on-site are sent to off-site facilities for treatment, as needed, before disposal at permitted off-site facilities.

Solid Waste Collection and Recycling Center

The SWCRC collects and processes recyclable and nonrecyclable solid waste generated by SNL/NM operations in compliance with all applicable regulations. This has resulted in the facility being below the New Mexico threshold of commercial solid waste picked up on an average daily basis. The SWCRC does not accept hazardous, radioactive, residential, or food service wastes. Solid waste is disposed of locally at the COA Cerro Colorado landfill, and recyclables are either picked up by or delivered to vendors.

Another important function of the SWCRC is to collect, process (screen, bale, and track), market, and ship the following recyclable materials from SNL/NM: cardboard, white paper, mixed paper, aluminum cans, and numerous categories of plastics and other metals. Recyclables constitute over 50 percent of SNL/NM commercial solid waste, and diverting the recyclables significantly reduces the number of trips to the landfill. Proceeds from the sale of recyclable materials are reinvested in the recycling program. The SWCRC also provides some recycling support for the DOE/NNSA.

MSP2 Awareness and Outreach

MSP2 personnel conduct awareness programs and outreach activities that promote and teach MSP2 strategies and technologies to waste generators. MSP2 information and successes can be found at the following website:

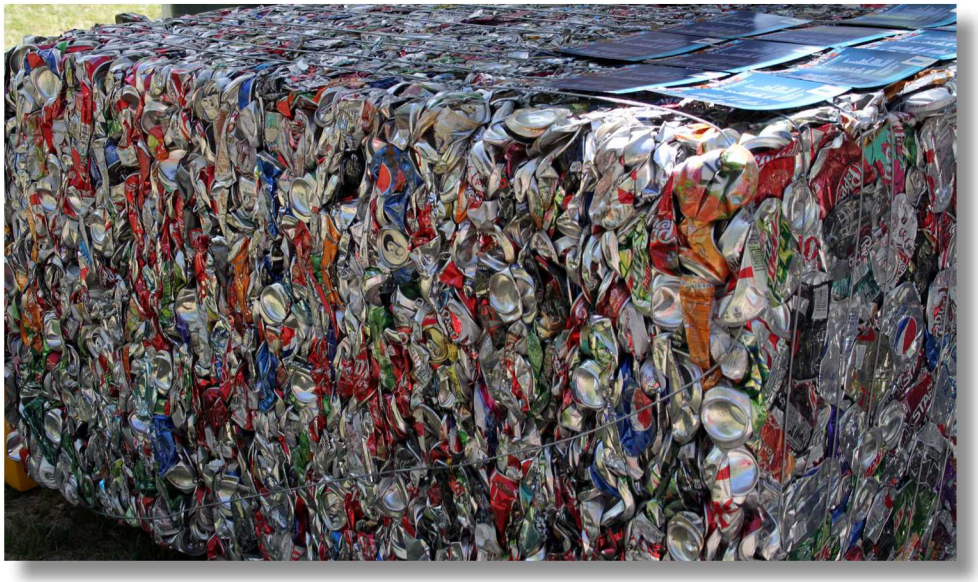
http://p2.sandia.gov

The MSP2 Program supports numerous environmental awareness events every year. Sandia's Earth Day event in April 2014 was combined with the Take Our Sons and Daughters to Work event. In addition, MSP2 personnel hosted 17 Zero Waste events with cooperation and support from catering contractors to teach participants that it is possible to eliminate waste. These Zero Waste evecnts were held in conjunction with non-environmentally oriented activities, such as the Hispanic Heritage and Diversity Awareness Event and Sandia's Family Day.

Waste Reduction

The MSP2 Program has continued its contract with a local composting company to divert food waste from on-site cafeterias that serve up to 1,200 customers per day and from catered events. During 2014, 41,359 pounds of food waste, approximately 55 percent of the total cafeteria solid waste, was diverted from the landfill. In addition, Sandia has joined TerraCycle and established a Brigade, coordinating with Frito-Lay to collect and recycle Frito-Lay brand chip and snack bags (the majority of the snack bags sold at SNL). In 2014, 49 pounds of Frito-Lay snack bags (4,619 bags) were diverted to recycling bins placed in each cafeteria. This serves as an example of the efforts to make recycling a part of daily work activities.

In other waste reduction efforts, 134,718 pounds of mixed paper was diverted and recycled in 2014, which was an increase from approximately 103,700 pounds in 2013. This significant increase was due to an expanding partnership with Custodial Services to support what was previously a volunteer-based effort.



Recycling at SNL/NM

Terrestrial Surveillance Program

The Terrestrial Surveillance Program conducts sampling activities to detect any potential releases or migration of radiological or nonradiological contaminated material to off-site locations (community locations outside KAFB boundaries). Soil, sediment, and vegetation are collected from on-site, perimeter, and off-site locations. In 2014, there was one soil sample with an elevated value for chromium. The location was resampled, and the results did not warrant further investigation. No vegetation samples were collected in 2014 due to ongoing drought conditions.

Meteorological Monitoring and Air Quality Compliance Programs

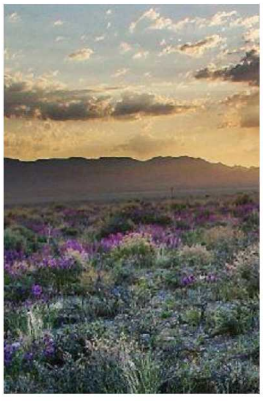
The Meteorological and Air Quality Compliance programs ensure compliance with air quality regulations, monitoring ambient air quality and radionuclide air emissions.

Meteorological Monitoring Program

In 2014, data were collected from eight meteorological towers located throughout KAFB. The data provided modeling information on the transport and air dispersion of pollutants. Table 4 shows some of the variations and extremes found in meteorological measurements across SNL/NM.

Table 4. Variations and extremes in meteorological measurements across the tower network, 2014

Wind Speed	Minimum (meters per second)	Maximum (meters per second)	Spread (meters per second)
Average annual wind speed	3.59 Tower KU1	3.98 Tower CW1	-0.39
Greatest difference in average wind speed over 24 hours	9.91 Tower SC1	15.00 Tower A13	5.09
Greatest difference in daily maximum wind gust	11.56 Tower A21	25.69 Tower MW1	14.13
Average difference in daily wind speed variations	0.99 all towers		



Temperature	Minimum (degrees Celsius)	Maximum (degrees Celsius)	Spread (degrees Celsius)
Average annual temperature	-14.06 Tower SC1	14.68 Tower A13	0.62
Network annual extremes	-13.63 Tower MW1	37.99 Tower CL1	51.62
Greatest difference in daily minimum temperature	1.50 Tower CW1	9.15 Tower SC1	7.65
Greatest difference in average daily temperature	-0.31 Tower SC1	1.53 Tower CW1	1.85
Greatest difference in daily maximum temperature	11.44 Tower A36	14.88 Tower CL1	3.44

Precipitation	Minimum (centimeters)	Maximum (centimeters)	Spread (centimeters)
Annual precipitation (extremes)	15.90 Tower A36	24.61 Tower A21	8.71
24-hour rainfall variation	0.41 Tower A36	3.09 Tower A36	2.68
Greatest monthly precipitation difference	4.42 Tower SC1	9.19 Tower A21	4.77
Greatest in monthly rainfall		9.19 Tower A21	

NOTE: Winter precipitation that falls as snow may be underestimated (mostly at the SC1 tower).

Ambient Air Monitoring

In support of the EPA requirement that the COA monitor ambient air in Bernalillo County, Sandia measures ambient air quality at six air-monitoring stations located on or near SNL/NM property. Currently, the network monitors VOCs, particulate matter that has a diameter equal to or less than 10 microns (PM_{10}), and particulate matter that has a diameter equal to or less than 2.5 microns ($PM_{2.5}$). Results of monitoring in 2014 indicate the following: PM_{10}, $PM_{2.5}$, and volatile organic compound concentrations are comparable to results from previous years.

Radiological National Emission Standards for Hazardous Air Pollutants Compliance

Radiological National Emission Standards for Hazardous Air Pollutants Compliance Subpart H regulates radionuclide air emissions from DOE/NNSA facilities, with the exception of naturally occurring radon. In 2014, the primary radionuclides released from SNL/NM facilities were tritium and argon 41. In 2014, the on-site maximally exposed individual was located on KAFB at the Kirtland Storage Facility. The on-site maximally exposed individual dose of 8.30E-04 millirems per year resulted primarily from tritium releases at the Neutron Generation Facility. The off-site maximally exposed individual was located at the KAFB Eubank Gate area. The off-site maximally exposed individual dose of 8.32E-04 millirems per year at the Eubank Gate area also primarily resulted from tritium releases at the Neutron Generation Facility. Both doses are well below the 10 millirems per year EPA standard. By comparison, the average person in the U.S. receives 311 millirems per year from natural background radiation.

Loggerhead Shrike

Air Quality Compliance

Air quality standards are implemented by regulations promulgated by local and federal governments in accordance with the Clean Air Act and the Clean Air Act Amendments of 1990. The Albuquerque Bernalillo County Air Quality Control Board, the State of New Mexico, and the EPA determine applicable air quality standards for nonradiological pollutants. Air Quality Compliance Program personnel currently maintain 13 Authority-to-Construct New Source Review permits and 29 issued New Source Review registrations from the COA.

Apache plume

Water Quality Program personnel conduct effluent monitoring through wastewater, surface water, and stormwater sampling and surveillance activities.

Wastewater Discharge Program

Wastewater from SNL/NM is discharged from six on-site outfalls permitted by the Albuquerque Bernalillo County Water Utility Authority (ABCWUA). Wastewater is monitored to ensure that all discharges meet the standards set by the ABCWUA's Publicly Owned Treatment Works. During 2014, there was one reportable sanitary sewer system release. On January 27, 2014, the ABCWUA issued a Notice of Violation for levels of zinc that were above the permitted limit of 2.2 milligrams per liter. The zinc level was 7.2 milligrams per liter from a sample collected by the ABCWUA at the Permit 2069I wastewater monitoring station on October 30, 2013. A review of the chemicals used by Custodial Services found the source of zinc to be in a commercial floor-care wax product that was being used in a building during the same time frame as sampling; use of the wax product was discontinued site-wide.

The ABCWUA presents Wastewater Compliance Awards, and Sandia received five Gold Pre-Treatment Awards and one Silver Pre-Treatment Award for the 2013 to 2014 reporting year (November 2013 through November 2014). A Gold Pre-Treatment Award is given based on a facility's 100 percent compliance (90 percent compliance for a silver award) with reporting requirements and discharge limits set in its permits or for exceptional source reduction and pollution prevention.

Surface Discharge Program

All water that will be released to the ground surface, either directly or to lined containments, is defined as surface discharge. These discharges must meet State of New Mexico surface discharge standards. All internal discharges approved by Sandia in 2014 met NMED New Mexico Water Quality Control Commission standards. Routine surface discharges are made to two evaporation lagoons that service the SNL/NM pulsed power facilities under an existing discharge permit. In 2014, a new discharge permit was used for the lagoons, and all permit requirements were met for both NMED-permitted lagoons. In 2014, 12 individual surface discharge requests were made; all NMED standards were met. Four accidental surface releases were reported to the NMED.

Stormwater Program

Black bears at SNL/NM

Sandia's Stormwater Program personnel ensured compliance with two EPA National Pollutant Discharge Elimination System permits, the Multi-Sector General Permit and the Construction General Permit. Coverage under a third permit, the Middle Rio Grande Watershed-Based Municipal Separate Storm Sewer System, is pending approval. Compliance with the permits in place in 2014 included the following activities: preparing Stormwater Pollution Prevention Plans, conducting site inspections, and collecting samples for laboratory analysis at the designated SNL/NM stormwater sampling points (including the environmental surveillance sample locations). In 2014, all National Pollutant Discharge Elimination System monitoring data was reviewed and submitted to the EPA. Stormwater sampling was performed from July 1 through October 31 when there was adequate runoff to collect required samples. There were notable exceedances of benchmark levels for cadmium, lead, and cyanide at five sampling points throughout the season. These exceedances are being reviewed as part of the selection, design, installation, and implementation of stormwater control measures and improvements. Stormwater exceedances for magnesium, aluminum, copper, iron, and zinc were consistent with natural background soil concentrations at SNL/NM.

Oil Storage and Spill Control

The Spill Prevention Control and Countermeasures Plan (required under the Clean Water Act) describes the oil storage facilities at SNL/NM and the mitigation controls in place to prevent inadvertent discharges of oil. Oil storage facilities subject to regulations include oil storage tanks (aboveground storage tanks, underground storage tanks, and transformers), bulk storage areas (multiple containers), and temporary or portable tanks. Sandia currently operates 47 aboveground storage tanks and 3 underground storage tanks at SNL/NM.

QUALITY ASSURANCE

All SNL/NM environmental monitoring (which includes sampling) is conducted in accordance with program-specific sampling and analysis plans, work plans, or quality assurance plans, which contain applicable quality assurance elements. These documents meet appropriate federal, state, and local regulatory guidelines for conducting sampling and analysis activities. Personnel in various programs collect environmental samples and analyze the samples for radiological and nonradiological constituents. Some sampling is specifically mandated by regulations to meet compliance, while other sampling activities are carried out in accordance with DOE directives.

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Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.