

# LA-UR-12-24845

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Title: Long-term Environmental Stewardship and Sustainability Strategy

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Intended for: Report  
Environmental Programs

Issued: 2013-11-05 (rev.2)



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Los Alamos National Laboratory's mission is to develop and apply science and technology to

- ensure the safety, security, and reliability of the U.S. nuclear deterrent;
- reduce global threats; and
- solve other emerging national security and energy challenges.



# Long-Term Environmental Stewardship & Sustainability Strategy



## Environmental Governing Policy

"We are committed to act as stewards of our environment to achieve our mission in accordance with all applicable environmental requirements. We set continual improvement objectives and targets, measure and document our progress, and share our results with our workforce, sponsors, and public. We reduce our environmental risk through legacy cleanup, pollution prevention, and long-term sustainability programs."

January 3, 2012

**We want your feedback. Please contact us at:**

- Call the Environmental Outreach Office: 505-667-0216
- E-mail the Environmental Outreach Office: [envoutreach@lanl.gov](mailto:envoutreach@lanl.gov)
- Write us at: Environmental Outreach  
Los Alamos National Laboratory  
P.O. Box 1663, MS M996,  
Los Alamos, NM 87545



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## Community Collaboration

The Laboratory strives to be transparent in its stakeholder relationships. Stakeholders include the U.S. Environmental Protection Agency, the New Mexico Environment Department, nearby communities and governments, surrounding Pueblo governments, and citizens. The Laboratory supports DOE Northern New Mexico Citizen's Advisory Board (NNMCAB) to gain public input on its environmental remediation and waste management programs. Its public outreach program listens to public concerns and provides information of interest to the public through public meetings, information on the web, tours, and mailings.

The Laboratory works to increase public knowledge of environmental stewardship practices, to inform the public of the status of compliance, and to use stakeholder input to influence environmental stewardship decisions. To help accomplish this, the Laboratory publishes all its environmental sampling data for the public to access in the Intellus database.

Through government-to-government consultations and agreements, DOE and the Laboratory have well-established relationships with the Pueblos of northern New Mexico. The Laboratory works to augment these robust agreements through consultation on the activities that directly affect the tribes. The Laboratory meets regularly with the environment departments of pueblos and schedules periodic meetings with the Pueblo governments and their citizenry to discuss specific topics.

For more information and to provide feedback

- Visit LANL's environmental website: [www.lanl.gov/environment](http://www.lanl.gov/environment) and sign up for e-mail notification
- Visit the electronic Public Reading Room: <http://epr.lanl.gov>
- Visit the print Public Reading Room:  
97 Cities of Gold Road, Pojoaque, NM
- Call the Environmental Outreach Office: 505-667-0216
- E-mail the Environmental Outreach Office: [envoutreach@lanl.gov](mailto:envoutreach@lanl.gov)
- Write us at:  
Environmental Outreach  
Los Alamos National Laboratory  
P.O. Box 1663, MS M996,  
Los Alamos, NM 87545
- Visit [www.intellusNMdata.com](http://www.intellusNMdata.com) for all sampling data from LANL



Tour of Los Alamos Canyon weir



Tribal members on annual Nake'muu visit



NNMCAB tour of aboveground storage domes at Technical Area 54

*"Our stakeholders are committed, well-educated and knowledgeable. We work together as a community to make the best possible choices."*

Pete Maggiore, LASO Assistant Manager

## Intellus Contains 11 Million Environmental Sampling Records Open to the Public

**INTELLUS**  
is a publicly accessible database that provides access to over 11 million records collected by the Laboratory as part of environmental surveillance and compliance sampling activities.

**INTELLUS**  
provides transparency and accessibility to the environmental monitoring data from in and around Los Alamos National Laboratory

### Protections = Defenses in Depth for Protecting Human and Environmental Health

Protection #1

**Remove the source**

Protection #2

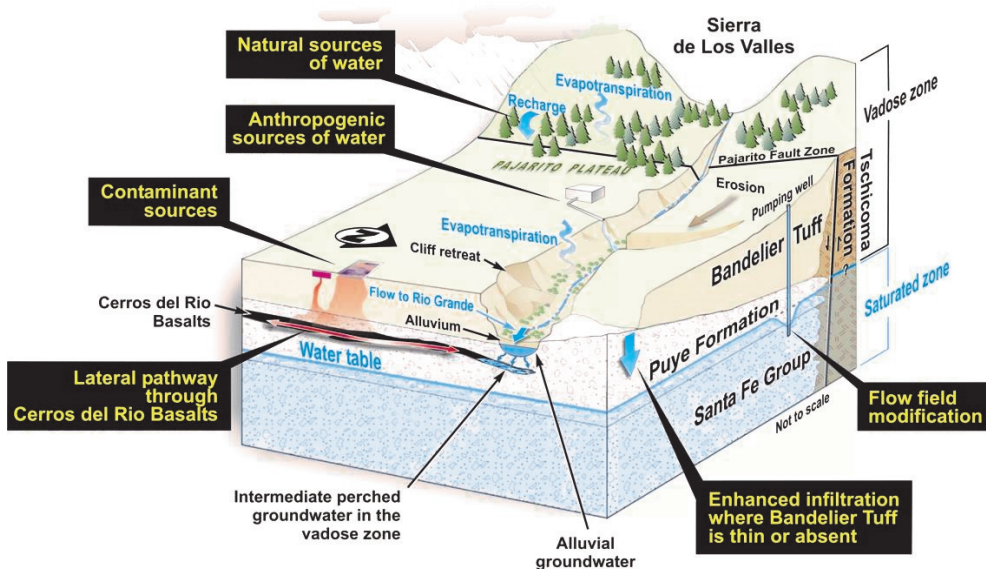
**Stabilize or remove sediments**

Protection #3

**Measure for known and unexpected contaminants**

A cornerstone of the long-term strategy is a “defenses-in-depth” approach. For a range of potential contaminants, the Laboratory measures levels at the room, facility, Laboratory, and sometimes regional level. Each contaminant has a regulatory value that, if approached or exceeded, triggers a series of corrective and preventive actions.

For example, contaminant concentrations in stormwater leaving the Laboratory are an issue of concern for all of us. The measurement and physical and administrative controls related to surface water management provide an excellent example of how the Laboratory proactively implements this strategy. A series of nested defenses, including an array of physical barriers located throughout drainages and at Laboratory boundaries, constitute a proactive approach to environmental protection. The Laboratory has installed grade-control structures in Pueblo and Los Alamos Canyons and upstream enhancements of riparian areas to reduce sediment transport at historical waste disposal areas. These efforts reduce erosion through runoff and runoff controls. Implementation of nested controls in the defenses-in-depth strategy helps to build public confidence in our commitment to public health and environmental protection.



*Anticipate, recognize, evaluate, control and mitigate emerging environmental challenges.*

# Long-Term Environmental Stewardship & Sustainability Strategy

## Los Alamos National Laboratory Los Alamos Site Manager’s Vision



**Kevin Smith, Site Manager**

The National Nuclear Security Administration is committed to stewardship of the Nation’s and New Mexico’s resources. I take that responsibility personally and I ensure that everything the Los Alamos Site Office does to support the Los Alamos National Laboratory’s mission has environmental protection and stewardship fully considered. As a result, I challenged LANL to integrate environmental protection activities into a comprehensive, long-term execution strategy that has a minimum of a 50-year horizon. The intent of this effort is to take control of LANL’s future

and set the standard for environmental stewardship for all of New Mexico. The mission performance of the Laboratory depends on many factors, including the best science and technology, working safely, producing quality products, and doing it securely. But without the health and long-term viability of the Los Alamos site, that mission could easily be jeopardized. The long-term environmental action plan is the blueprint for managing our environment, demonstrating responsible management to regulators and the public, and creating our

future rather than letting it happen to us. This includes cleaning up the legacy past, controlling and enhancing current operations, and transitioning to a long-term sustainable future.

### Advancing national security science while applying our full scientific capabilities to protecting and restoring the environment

- *The Laboratory’s commitment to excellence in science and technology is inseparable from our commitment to complete all work in an environmentally responsible manner*
- *The viability of the Laboratory depends on building public confidence in the fact that we are operating in a manner that protects human health and the environment*
- *As fellow community members we’re committed to conducting our business in a manner that ensures our impacts to the environment are as low as reasonably achievable*

## Laboratory Director’s Mission

With this strategy, we look to the future to challenge Laboratory managers to envision the long-range environmental issues that will face us. If the first nearly 70 years of the Lab are any indication, much can change in the coming decades. This strategy provides a framework for us to ask the right questions now, so that when new issues arise, we will be prepared. For example: we must seek the most effective ways to remediate the Lab’s remaining Cold War-era waste. We must devise ways to further reduce waste and environmental impacts on air, water, soil, and wildlife from current—and importantly *future*—national security missions. We must plan for the energy needs of tomorrow’s Lab facilities, including a generation

of supercomputers 1,000 times faster than those of today. From individual workers to facility planners, we must help create a sustainable Laboratory for the future. Today, the DOE/NNSA and the Laboratory manage environmental impacts through a variety of projects and programs that address specific requirements of federal and state regulations, DOE Orders, and permits. We understand that the health and viability of the Laboratory depend in part on a record of performance, building the confidence of our regulators and the public. To gain the right to do what we do, we must work safely, securely, ethically, and in a manner that protects the environment. This strategy integrates these various environmental



**Charlie McMillan, Director**

protection activities into a comprehensive environmental stewardship approach—a strategy to clean up the past, control current operations, and move toward a sustainable future where waste is minimized and other effects on the environment are reduced or eliminated.



### What is Los Alamos National Laboratory?

The mission of the Laboratory (also known as LANL) is to develop and apply science and technology to ensure the safety, security, and reliability of the U.S. nuclear deterrent; reduce global threats; and solve other emerging national security and energy challenges.

The Laboratory is located in Los Alamos County in north-central New Mexico. The 36-square-mile Laboratory is sited on the Pajarito Plateau, a series of mesas separated by deep east-to-west-oriented canyons cut by stream channels from the Jemez Mountains to the Rio Grande. With the exception of the towns of Los Alamos and White Rock, the surrounding land is largely undeveloped. Adjoining lands include the Santa Fe National Forest, Bandelier National Monument, Los Alamos County, and the Pueblo of San Ildefonso.

*"...to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans"*

National Environmental Policy Act Sec. 101

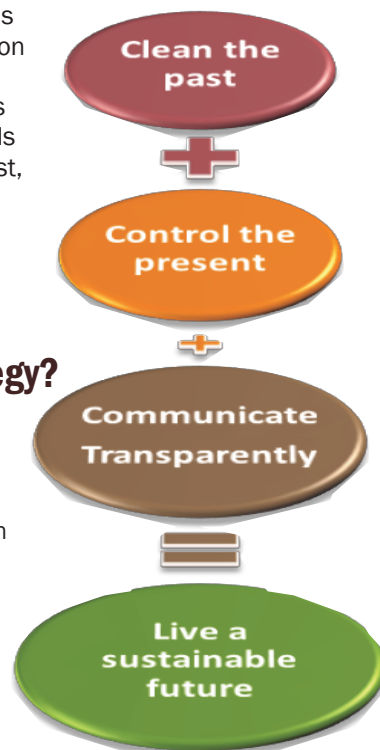
### Why a Long-Term Environmental Stewardship & Sustainability Strategy?

In the 1940s and 1950s, regulatory control did not exist. The end of the war and the start of the Cold War brought a new political climate, including the Atomic Energy Commission, but self-regulation continued.

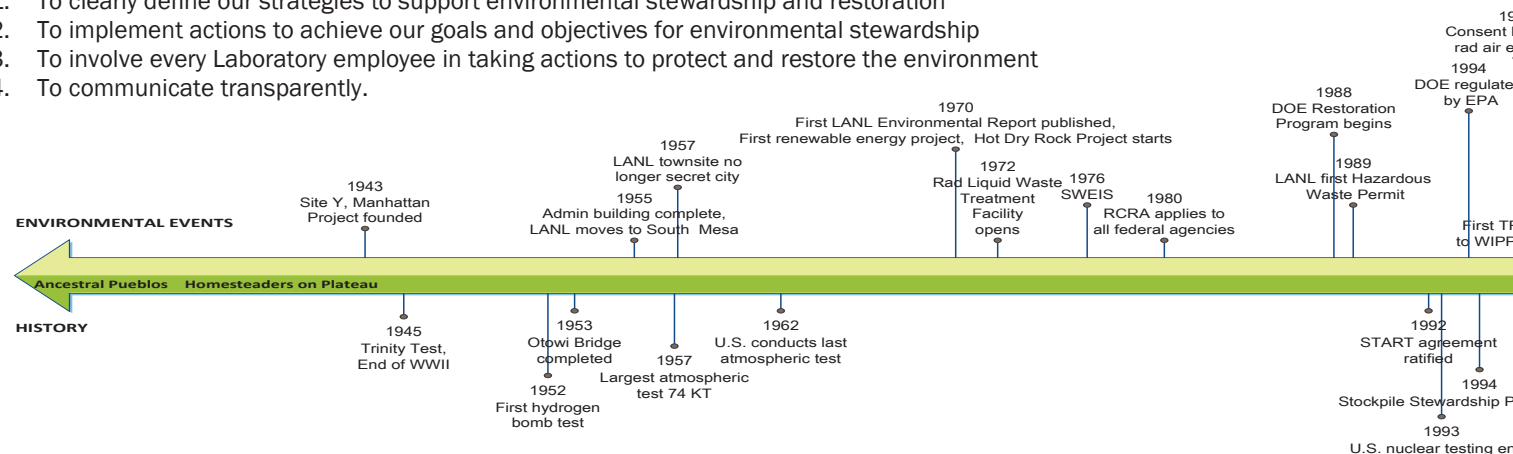
In the late 1960s and early 1970s, the rise of the nation's environmental movement focused attention on environmental management. The Clean Air Act and the Clean Water Act were passed. The U.S. Environmental Protection Agency (EPA) was established. The National Environmental Policy Act (NEPA) of 1969 included in its regulatory oversight the nuclear complex to regulatory scrutiny.

During the 1980s and 1990s, the U.S. Department of Energy (DOE) was required to comply with outside regulation such as the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). In the early 1990s, DOE performed comprehensive environment, safety, and health assessments, which drove a new culture of compliance and accountability.

Today, the Laboratory continues to comply with a complex set of regulations. As reflected by the nearly 70-year history of the Laboratory, the next 50 years will bring significant changes to the mission and operations of the Laboratory. Regardless of inevitable changes in mission and environmental requirements, the Laboratory is committed to operating the site sustainably. The foundation of the *Long-Term Environmental Stewardship & Sustainability Strategy* for Los Alamos National Laboratory is fourfold:



1. To clearly define our strategies to support environmental stewardship and restoration
2. To implement actions to achieve our goals and objectives for environmental stewardship
3. To involve every Laboratory employee in taking actions to protect and restore the environment
4. To communicate transparently.



### Shaping a Sustainable Future

A long-term horizon provides a framework for thinking about the end-states of current projects and programs and for envisioning what the Laboratory will look like in the long-term. Program and mission activities are dictated by Congress and the Executive Branch, and prediction about research and development in the distant future is uncertain. Because of the nature of the Laboratory's work, some radioactive and hazardous chemical waste will inevitably be produced. We continue to live in an unpredictable world, and the Laboratory is likely to continue in its role as the nation's premier national security research facility. However, if the last 50 years is any indication of future trends, some outcomes can be projected:

- Historical releases can be contaminants immobilized and cleaned up
- All waste can be disposed of off-site
- Excess lands can be transferred
- Environmental footprint can be reduced
- Operations can be consolidated and the facility footprint reduced
- Discharges and emissions can be reduced through environmental ALARA
- Site sustainability can be achieved
- Off-site contaminant transport can be eliminated
- The long-term strategy can be fully implemented



*"Ensuring that mission operations have the minimum possible effect on human and environmental health is my personal passion."*

**Michael Brandt**  
Associate Director for Environment, Safety and Health

### Trust but Verify: Environmental Sampling



LANL has installed hundreds of stormwater controls to clean up surface water.

Stormwater



LANL analyzes the air to ensure that emissions are as low as reasonably achievable.

Clean Air



LANL collects soils to verify that there are no new releases from LANL.

Soils



LANL tests food, plants and animals to make sure that contaminants are not moving off-site.

Foodstuffs & Biota

The Environmental Sampling Board, established by the long-term strategy, ensures that LANL collects relevant and appropriate data to answer questions about the protection of human and environmental health, and to satisfy regulatory requirements.

LANL must demonstrate the data are technically justified and of sufficient quality to characterize potential effects from LANL operations. Data collection procedures and results are transparent and readily available to the regulators and the public. An integrated strategy ensures a holistic, adaptable, and cost-effective environmental sampling program.



LANL takes thousands of samples from wells monthly show that drinking water is safe.

Groundwater

### Future State: Achieve a Sustainable Environment and Laboratory Mission

- The Laboratory of the future will not dispose of waste on-site. Waste will be consolidated, stored for less than 1 year, and shipped off-site to commercial and government disposal operations.
- The Laboratory boundary will change as lands are conveyed to others for economic development, thus realizing the long-term goal from the 1950s of having all technical facilities located south of Los Alamos Canyon.
- Within Laboratory boundaries, the total square footage of buildings will be reduced as specified in the Site Excess and Disposition Plan.
- The implementation of the Site Sustainability Plan will provide a measure of success in reduction in greenhouse gas emissions, energy consumption, water use, and solid waste, thus achieving DOE sustainability goals.
- Zero-waste initiatives to reduce or eliminate the production of waste and releases to the environment will ensure the Laboratory maintains a high level of environmental protection. This approach has the greatest potential for reducing the cost of compliance activities, while simultaneously improving and protecting environmental quality.
- Focus on sustainable initiatives and minimize our environmental footprint.



Low-flow power generation



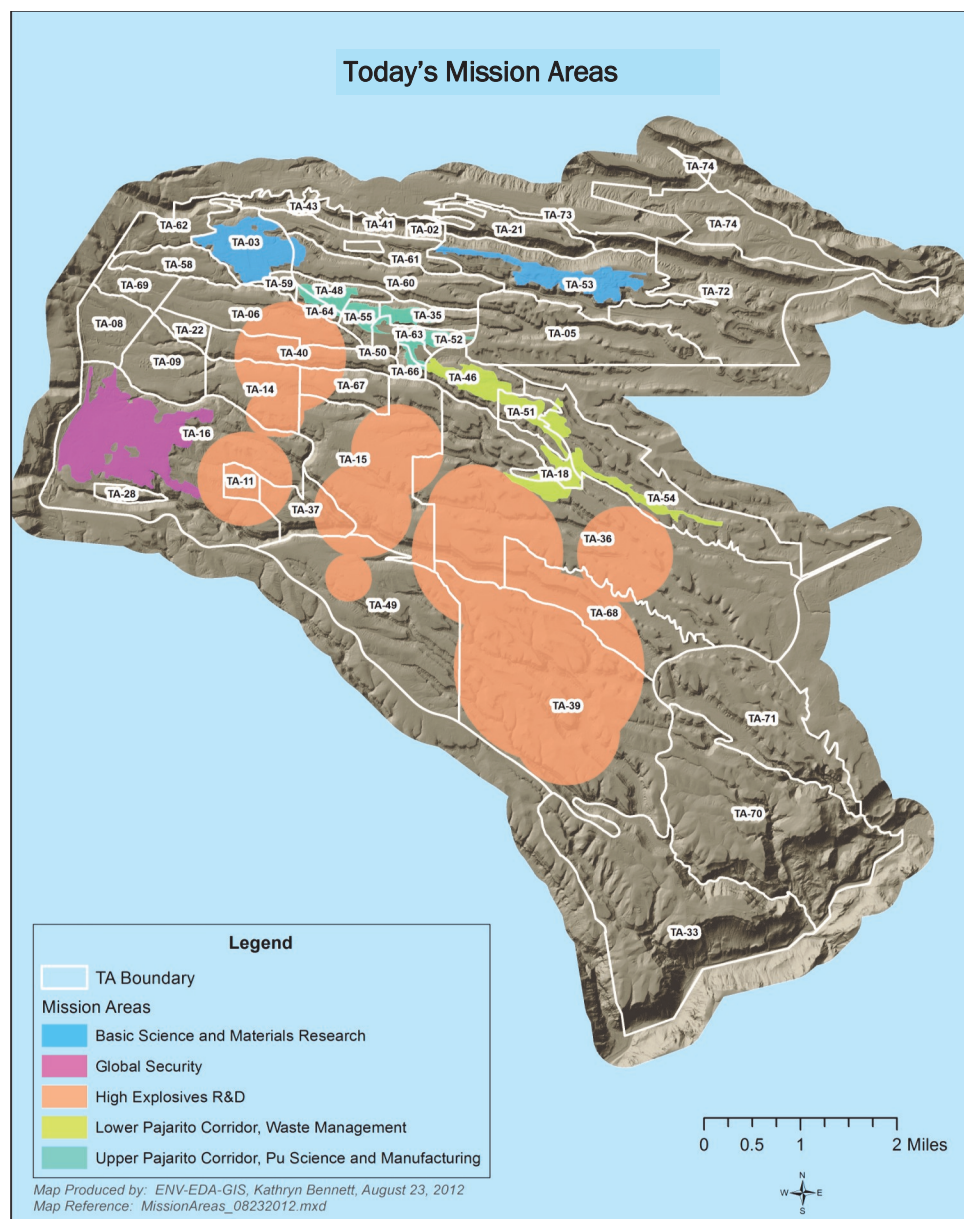
Bike to work



Recycle and reuse water



Celebrate green goals



### Environmental Grand Challenges—Our Goals to Live a Sustainable Future



Remove or stabilize pollutants from the Manhattan Project and Cold War eras.



Protect water resource quality and reduce water use.



Eliminate industrial emissions, discharges, and releases to the environment.



Protect human and environmental health by managing and restoring lands.

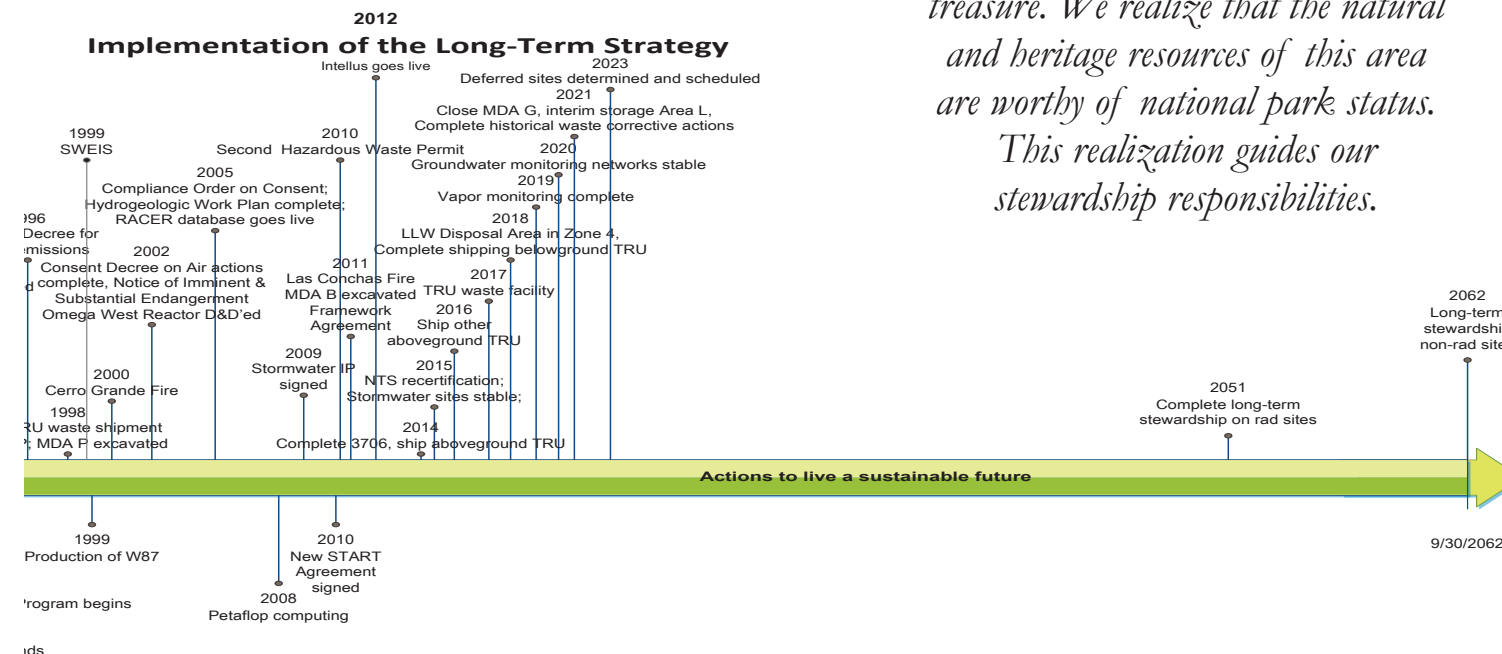


Produce zero radioactive, hazardous, liquid, or solid wastes.



Collaborate with our stakeholders and tribal governments to ensure that LANL's impact on the environment is as low as reasonably achievable.

*The Pajarito Plateau is a national treasure. We realize that the natural and heritage resources of this area are worthy of national park status. This realization guides our stewardship responsibilities.*



### We're Actively Solving Significant Environmental Challenges



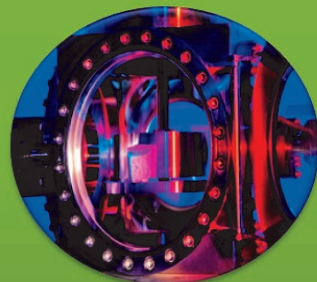
#### Clean Up the Past

- Remove transuranic (TRU) waste stored above ground
- Mitigate contamination in groundwater
- Protect groundwater from contamination
- Keep contaminants on-site
- Prevent contaminant transport to the Rio Grande
- Ensure regulatory compliance
- Remove and stabilize contaminants in soil



#### Control the Present

- Identify risks and take action
- Plan for future waste disposal options
- Implement pollution prevention solutions
- Manage risk using our ISO 14001 certified Environmental Management System (EMS)
- Operate in compliance with environmental laws, regulations & DOE orders
- The mission is inseparable from environmental stewardship



#### Live a Sustainable Future

- Conserve water and ensure adequate supply
- Conserve electricity and increase use of renewable energy
- Mitigate secondary impacts from climate change such as habitat degradation
- Protect environmental and human health

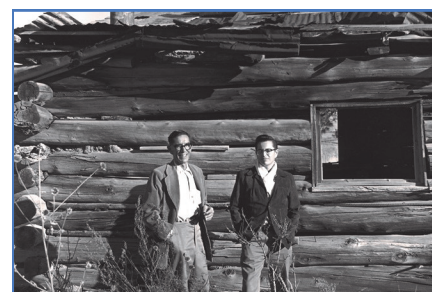


The Northern New Mexico Citizen's Advisory Board stop at a stormwater sampling station while touring Los Alamos Canyon

#### Homesteader Era



Bean harvest on the plateau



Romero relatives at Romero Cabin



Plowing on the plateau

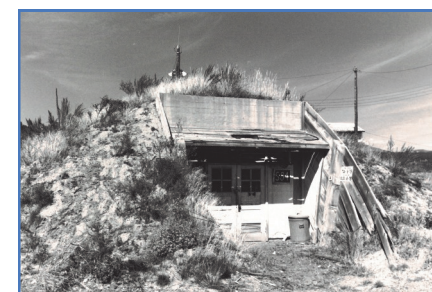
#### Manhattan Project Era



Trinity Test assembly building at V-Site



TA-01 @ Ashley Pond 1946



1940s era bunker at the Laboratory

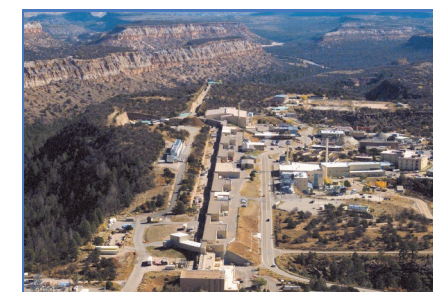
#### Today



TA-03 during summer monsoon



Radiological Laboratory Utility Office Building



Los Alamos Neutron Science Center linear accelerator

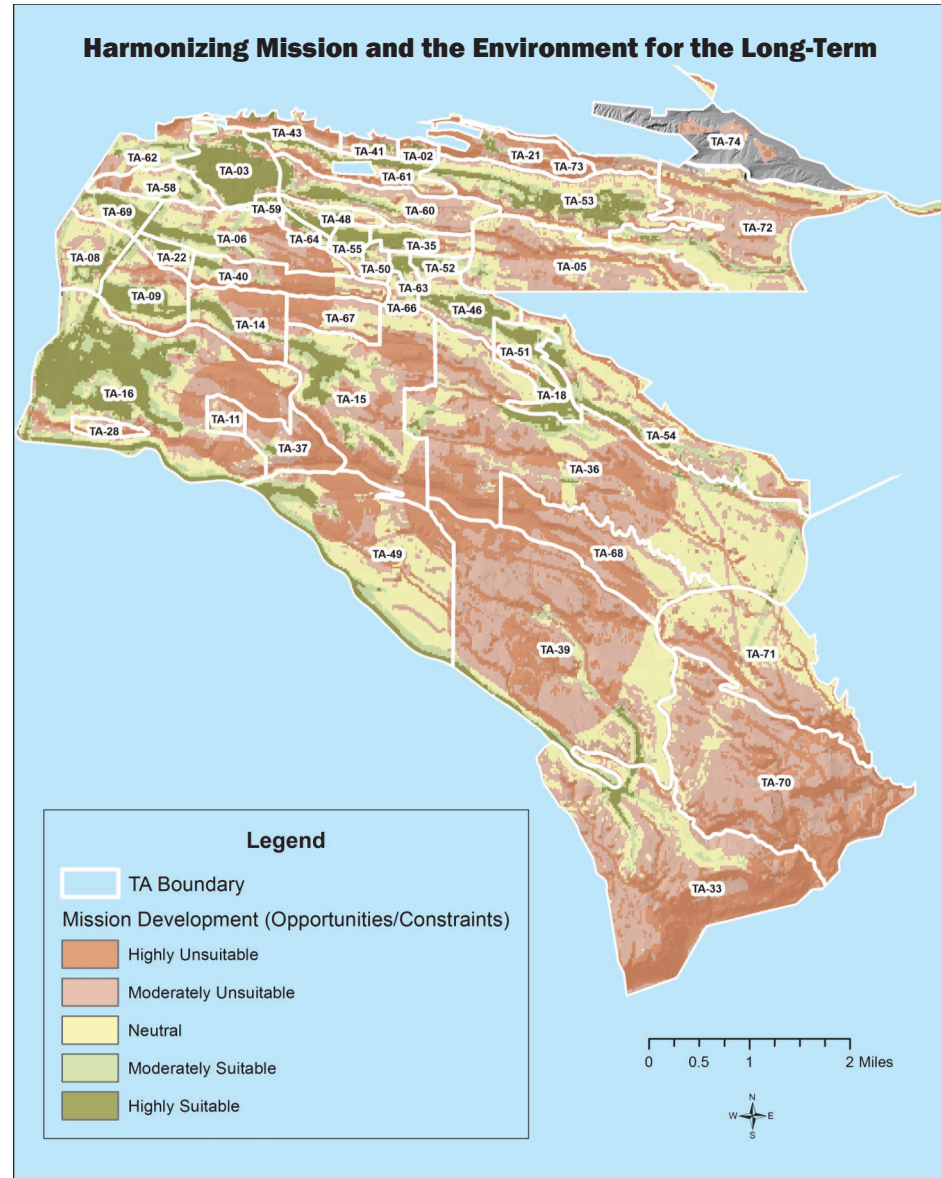
### Historical Properties Require Protections Today and into the Future

There are about 2000 known archeological sites at the Laboratory. These archeological sites represent the cultural history and traditional lifeways of Native American communities and Hispanic and Anglo homesteaders. The majority of these sites represent the villages, farmsteads, rock art panels, trails, and shrines of more than 10,000 years of Native American use of the Pajarito Plateau, knowledge of which is still actively preserved in the living memory of modern Puebloan neighbors and other nearby tribes. The Ancestral Puebloan remains are themselves of such cultural richness and significance that in the early 1900s the lands now occupied by the Laboratory were included in the then proposed "Pajarito Park," which was eventually scaled back to that of the present Bandelier National Monument.

The other archeological sites at the Laboratory represent the remains of homes, wagon roads, trails, trash scatters, fences, and fields of early 20th century homesteaders. In addition, the built environment includes hundreds of historical buildings and structures that represent locations where significant research and development activities took place—beginning with the Manhattan Project in 1943—that helped to define the recent history of the U.S. and many aspects of the modern technological world.

The remaining Manhattan Project buildings are considered some of the most significant historic properties of the 20th century. These properties are the cornerstone of the proposed Manhattan Project National Historical Park.

### Future State: Laboratory Endures in Harmony with Wildlands and Heritage



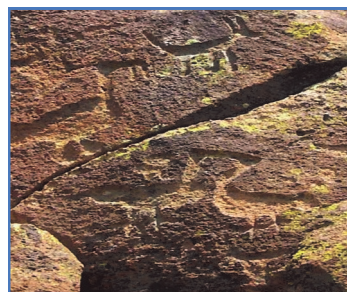
#### Ancestral Pueblo Era



Coalition pottery



Cavates with roof beam holes



Rock art

- A new TRU waste facility will be completed and operational, processing waste after the expected closure of Area G. TRU waste will be characterized, consolidated, and packaged at generator locations and then staged in the TRU waste facility for disposal off-site.
- The number of industrial waste outfalls permitted under the National Pollutant Discharge Elimination System (NPDES) Storm Water Individual Permit (IP) may be reduced to as few as two. Those remaining will have the potential to become no-flow outfalls but will remain in the NPDES permit to allow the capability to discharge, if necessary. A new Radioactive Liquid Waste Treatment Facility will be complete and will have achieved a zero-discharge capability.
- Through the pollution prevention process to make effects on environment as low as reasonably achievable (ALARA), discharges and emissions to the environment will be further reduced or eliminated.
- Forest restoration efforts will have achieved a low wildland fire risk to people, facilities, and infrastructure throughout the Laboratory and will also have created improved habitat for wildlife.

### Taking Action Today to Live a Sustainable Future

#### Clean Up the Past

- Measure changes to water and soil, and implement environmental cleanup solutions
- Protect surface water runoff through the use of engineered controls
- Ship transuranic (TRU) waste to permanent disposal at the Waste Isolation Pilot Plant
- Reduce on-site radioactive and hazardous waste volume
- Consolidate Laboratory operations and decontaminate and demolish excess facilities (reduce footprint)

#### Control the Present

- Protect human health and safeguard the environment
- Use our EMS to identify and control hazards
- Prevent spills and leaks
- Reduce waste streams through green purchasing
- Expand chemical re-use and recycling
- Prevent pollution and minimize waste through continuous improvement
- Eliminate nonpoint pollution of stormwater
- Improve fuel efficiency and right-size the government vehicle fleet

#### Live a Sustainable Future

In concert with the Site Sustainability Plan and Long-Range Development Plan, set specific future goals:

- Reduce and consolidate the Laboratory footprint
- Increase energy efficiency
- Protect green fields through sitewide planning
- Reduce water use
- Reduce greenhouse gases by 90% in 10 years
- Refit or build high-performance sustainable buildings
- Design an enhanced environmental strategy for keeping impact as low as reasonably achievable (ALARA)
- Manage energy use in data centers
- Engage stakeholders, tribal governments, and neighbors in regional and local planning for a sustainable future
- Develop new sustainable technologies for the environment

### Long-Term Environmental Stewardship & Sustainability Strategy





### Environmental Stewardship Framework



### Integrating Environmental Stewardship to Enable the National Security Mission

This strategy cannot be effective without systematic integration with other related Laboratory functions, such as site planning, project management, and facilities management. The process of integration will take time, but several steps have been identified during the initial development of the strategy and are now under way. Integrating actions are listed below.

- Focus environmental sampling through the use of a Laboratory-wide environmental surveillance sampling strategy.

- Centralize geographic information system (GIS) services to improve land-management decisions.
- Establish a comprehensive set of metrics to gauge progress on environmental stewardship.
- Improve the project review process for land-use planning and site selection.
- Integrate sitewide planning efforts, including the Site Sustainability Plan and the Long-Range Development Plan.

*“At LANL, our commitment to controlling impacts on the environment is done hand-in-hand with everyday operations. That’s the only way it can work.”*



Carl Beard, Principal Associate Director for Operations

### Management by Eco Region Builds Solutions for Specific Pollutants and Pathways

Eco Region	Management Concerns	Current Protections	Future Use and Disposition
All Eco Regions	<ul style="list-style-type: none"> <li>• Environmental Grand Challenges apply to entire Laboratory</li> </ul>	<ul style="list-style-type: none"> <li>• Consent Order process</li> <li>• National Environmental Protection Act</li> <li>• Defenses in Depth</li> <li>• Comprehensive sampling</li> <li>• Biological, Habitat &amp; Cultural Resource Management Plans (BRMP, HMP, and CRMP)</li> <li>• Environmental restoration activities</li> <li>• Pollution prevention and waste minimization</li> </ul>	<ul style="list-style-type: none"> <li>• Create a sustainable future by protecting environmental and human health</li> <li>• Sustainable mission national and global security activities with environmental impacts as low as reasonably achievable</li> <li>• Environmental buffers for climate change resilience, safety &amp; security</li> </ul>
Ancho	<ul style="list-style-type: none"> <li>• Explosives &amp; depleted uranium in soils</li> <li>• Recreation &amp; erosion impacts to heritage resources</li> <li>• Open detonation sites</li> </ul>	<ul style="list-style-type: none"> <li>• Erosion and access controls</li> <li>• Trails management program</li> <li>• Increased containment of contaminants</li> </ul>	<ul style="list-style-type: none"> <li>• Greenbelt habitat corridor</li> <li>• Environmental and human health protected</li> <li>• Rio Grande River protected</li> </ul>
Chaquehui	<ul style="list-style-type: none"> <li>• No special issues</li> </ul>	<ul style="list-style-type: none"> <li>• Access control</li> <li>• Environmental sampling</li> </ul>	<ul style="list-style-type: none"> <li>• Healthy ecosystem services in habitats</li> <li>• Climate change resilience buffers</li> </ul>
Frijoles	<ul style="list-style-type: none"> <li>• No special issues</li> </ul>	<ul style="list-style-type: none"> <li>• Not applicable</li> </ul>	<ul style="list-style-type: none"> <li>• Buffers for climate resilience, safety, security</li> </ul>
Los Alamos / Pueblo	<ul style="list-style-type: none"> <li>• Stormwater contaminant transport to Rio Grande</li> <li>• Post-fire flooding</li> <li>• MDAs A &amp; T</li> <li>• Discharges &amp; emissions</li> <li>• Heritage resource conservation</li> </ul>	<ul style="list-style-type: none"> <li>• Stormwater controls to protect Rio Grande</li> <li>• Defenses In Depth</li> <li>• Eliminate exposure pathways</li> <li>• Outfall reduction</li> <li>• CRMP</li> </ul>	<ul style="list-style-type: none"> <li>• Rio Grande River protected</li> <li>• Sustainable mission and facilities</li> <li>• Land transferred</li> <li>• Adequate and safe drinking water</li> </ul>
Mortadad	<ul style="list-style-type: none"> <li>• Chromium &amp; perchlorate in groundwater</li> <li>• Heritage resource conservation</li> <li>• Threatened &amp; endangered species habitat</li> <li>• Post-fire flooding</li> <li>• Outfall discharges</li> </ul>	<ul style="list-style-type: none"> <li>• Mitigate under Consent Order Process</li> <li>• CRMP</li> <li>• BRMP &amp; HMP</li> <li>• Defense in depth</li> <li>• Outfall reduction</li> </ul>	<ul style="list-style-type: none"> <li>• Historical waste removed or stabilized</li> <li>• Cultural resource preserved</li> <li>• Threatened &amp; endangered species protected</li> <li>• Groundwater protected</li> <li>• Zero waste</li> </ul>
Pajarito	<ul style="list-style-type: none"> <li>• Staging and waste removal</li> <li>• Groundwater protection at TA54</li> <li>• MDAs C, G, H, and L</li> <li>• Heritage resource conservation</li> <li>• Threatened &amp; endangered species</li> </ul>	<ul style="list-style-type: none"> <li>• Enduring waste strategy</li> <li>• Protect groundwater through Consent Order</li> <li>• Defenses in depth</li> <li>• CRMP &amp; creative mitigations</li> <li>• HMP</li> <li>• BRMP</li> </ul>	<ul style="list-style-type: none"> <li>• No contaminant transport</li> <li>• Groundwater protected</li> <li>• Cultural resource preserved</li> <li>• Threatened &amp; Endangered Species protected</li> <li>• Historical waste removed or stabilized</li> </ul>
Sandia	<ul style="list-style-type: none"> <li>• Contaminant migration from wetland &amp; shooting range</li> <li>• Cultural resources</li> <li>• Threatened &amp; endangered species habitat</li> </ul>	<ul style="list-style-type: none"> <li>• Wetland stabilization and management</li> <li>• Defense in depth</li> <li>• HMP</li> <li>• BRMP</li> </ul>	<ul style="list-style-type: none"> <li>• Improved environmental &amp; human health</li> <li>• Threatened &amp; endangered species protected</li> <li>• Climate change resilience</li> </ul>
Water	<ul style="list-style-type: none"> <li>• RDX in groundwater</li> <li>• Open detonation and firing sites</li> <li>• Cultural resources</li> <li>• Threatened &amp; endangered species habitat</li> <li>• Post-fire flooding</li> </ul>	<ul style="list-style-type: none"> <li>• Protect groundwater through Consent Order</li> <li>• Defenses in depth &amp; improved containment of sediments</li> <li>• CRMP &amp; archeological creative mitigations</li> <li>• BRMP/HMP</li> </ul>	<ul style="list-style-type: none"> <li>• Sustainable mission</li> <li>• Buffers for climate resilience, safety, security</li> <li>• Manhattan Project National Historical Park</li> </ul>

### Future State: Contaminants Immobilized and Cleaned Up

- The Laboratory will have completed the cleanup and mitigation of contaminants released during the Manhattan Project and Cold War eras in solid waste management units (SWMUs) and material disposal areas (MDAs) identified in the 2005 Compliance Order on Consent among the New Mexico Environment Department, the Department of Energy and the Laboratory. Some of the sites will be remediated, and sources removed and disposed of off-site, and others will be stabilized and monitored in long-term stewardship programs under the administrative control of DOE.
- The low-level radioactive waste disposal area, Area G, at Technical Area (TA)-54 will have ceased operations and will have been stabilized. The corrective measure evaluation process is in progress. The transuranic (TRU) waste inventory at TA-54 that meets the Waste Isolation Pilot Plant's acceptance criteria will have been shipped, the TRU waste domes removed, and the regulated units at Area G closed.
- Comprehensive stormwater improvements will have resulted in less erosion, less off-site sediment transport, and better water quality.



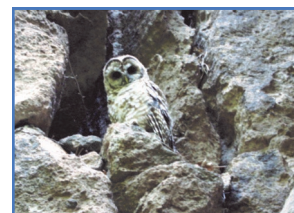
Bald eagle



Bobcat



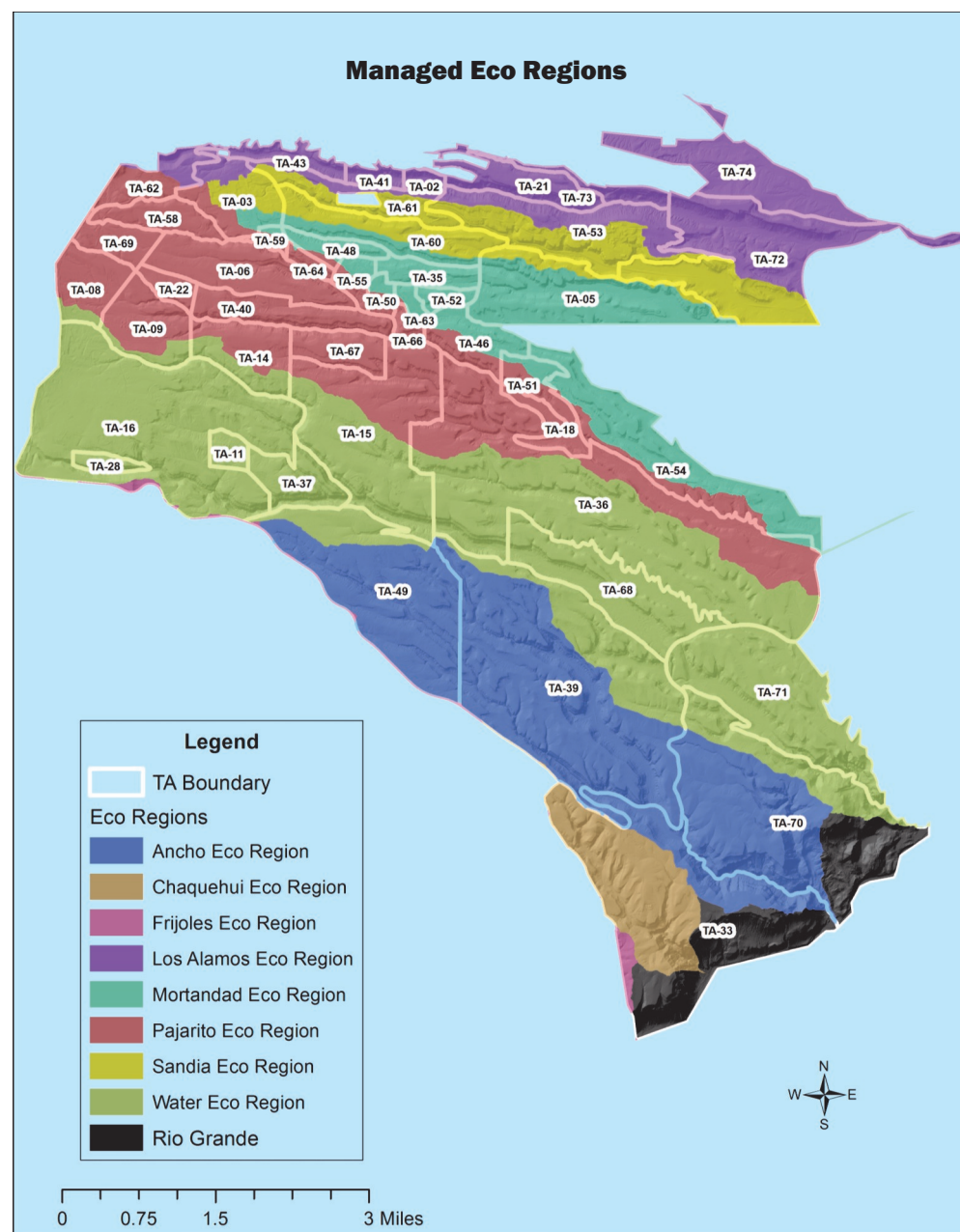
Mule deer



Mexican Spotted Owl



Paintbrush



### Active Environmental Management Integrated with and Driving Long-Term Planning

The Laboratory's Environmental Management System (EMS) brings together the Los Alamos National Security (LANS) senior executive team and Laboratory employees to systematically assess mission activities, determine the environmental impacts of those activities, prioritize improvements, and measure results. The Laboratory has been certified to the international standard (ISO 14001) since 2006. The most recent certification, which is performed by an independent third-party every 3 years, was in 2012.

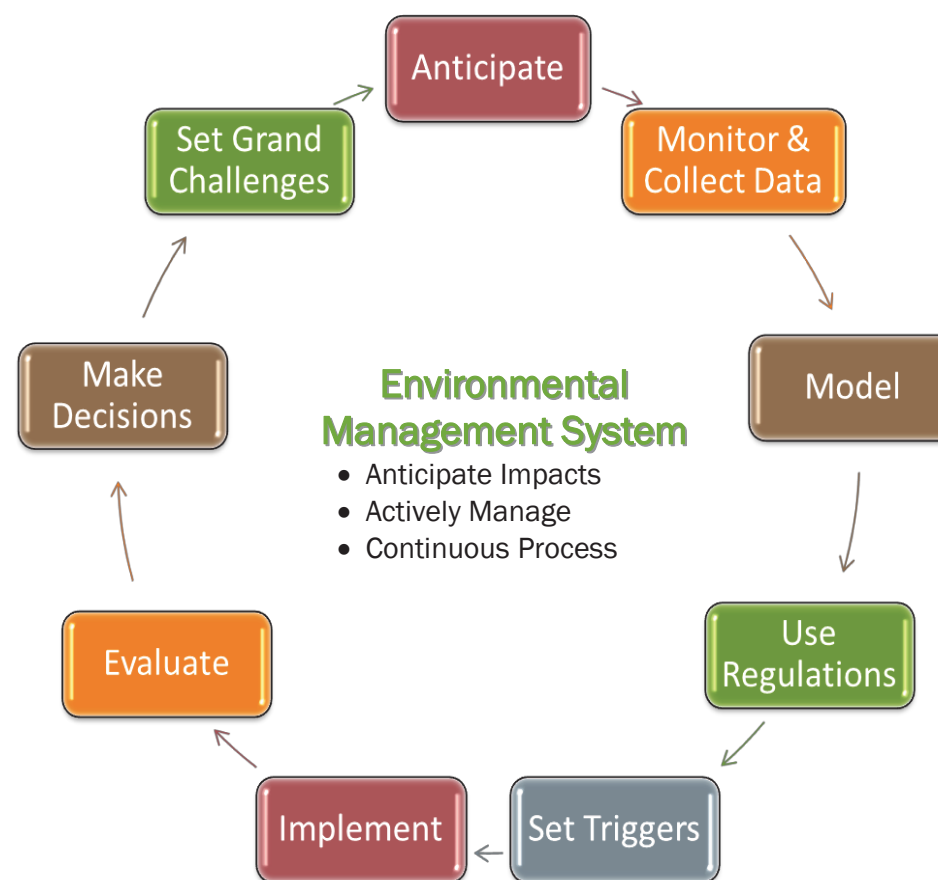
The Laboratory's environmental policy is as follows:

- We are committed to act as stewards of our environment to achieve our mission in accordance with all applicable environmental requirements.
- We set continual improvement objectives and targets, measure and document our progress, and share our results with our workforce, sponsors, and the public. We reduce our environmental risk through legacy cleanup, pollution prevention, and long-term sustainability programs.

We use the EMS to implement the strategy. Every year the goals and objectives of the strategy are used to develop EMS environmental action plans that are implemented and tracked to completion using the EMS. Given that the Laboratory mission and regulatory changes will occur over the next 50 years, the EMS is sufficiently robust to adapt to those changes.



George Rael, LASO Assistant Manager, and Beth Sellers, LANS Deputy Director deliver Pollution Prevention Awards to over 400 LANS employees.



*"The LANL EMS is exceptional in its methodical analysis of multiple regulatory requirements, and in integrating them into facility operations."*

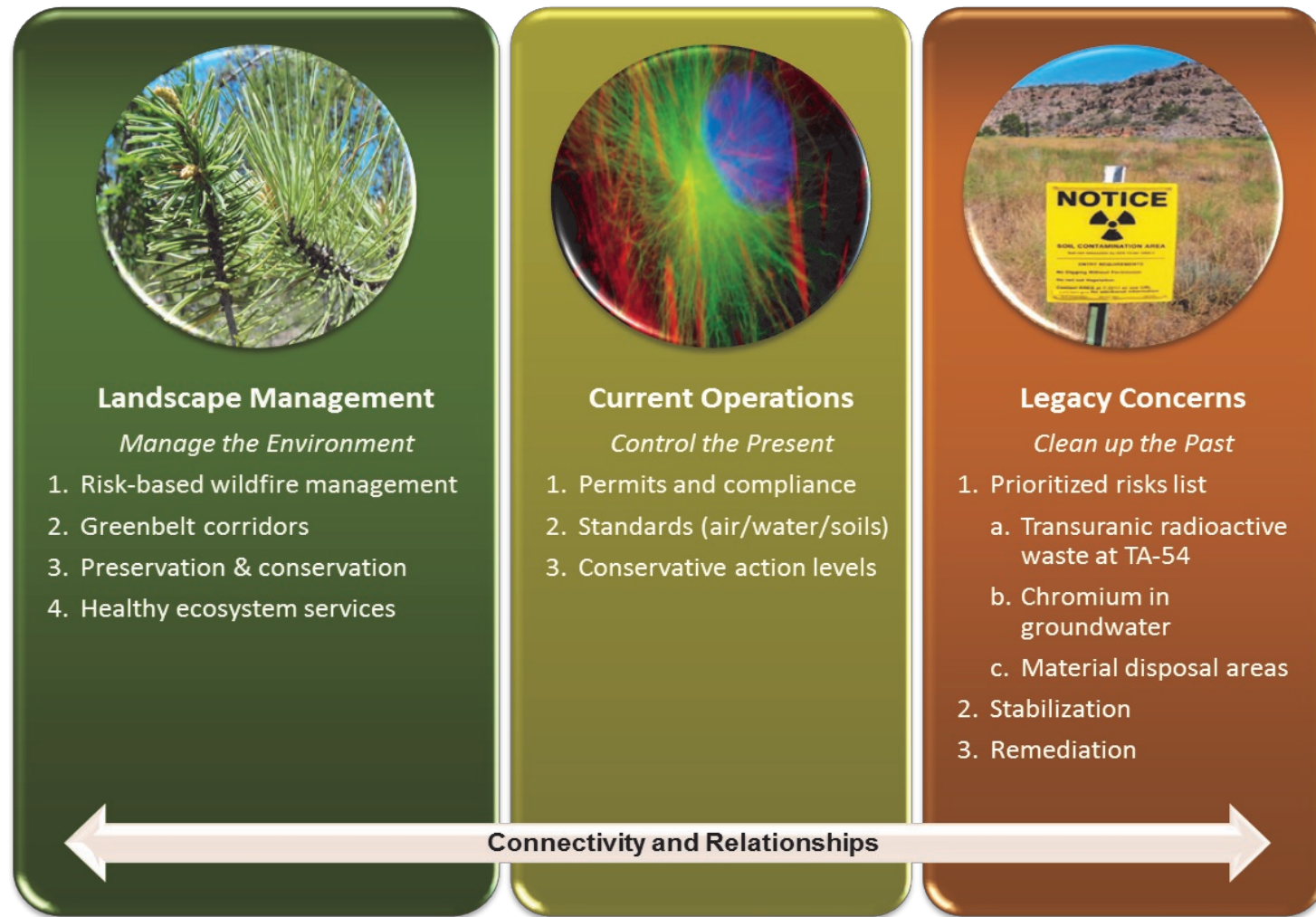
*"Exceptionally long-term thinking on land management and use of GIS optimizes resource use and control environmental impacts of development."*

*"A highly responsive corrective and preventive action process is very good at capturing operational experience here and elsewhere to integrate improvements into LANL programs."*

**Comments from the 2012 audit of the Environmental Management System performed by NSF-International Strategic Registration**

*The Los Alamos National Laboratory's world-class scientific capability will develop novel environmental and sustainability solutions.*

### Decision Support Application Implementation



The Decision Support Application is a land-use model for site planning to evaluate multiple environmental and operational opportunities and constraints to promote cost-effective mission development, minimize environmental impacts, and identify land potentially suitable for conveyance to others for economic development.

It provides access to an integrated environmental spatial database linked with analytical information on a wide range of environmental themes, including a high-resolution digital elevation model, orthographic photography, hydrology, sensitive habitat, cultural resources, solid waste management units, monitoring and sampling locations, flood-control features, infrastructure, facilities, utilities, and a host of other spatial environmental themes.



### Time Frames Dictate Stewardship Actions

Our approach to protecting the environment depends on whether we are cleaning up contamination from past activities, managing current operational impacts, or planning for a sustainable future.

When cleaning up past contamination, we focus on blocking or removing the pathways by which contaminants might move off-site. Our efforts center on measuring groundwater and surface water to determine if contaminants are moving into water sources. The natural boundaries of the watersheds crossing the site provide us with an ideal way to divide the landscape into work areas.

To ensure current operations result in the lowest reasonably achievable environmental impacts we practice pollution prevention, waste minimization, outfall reduction, and compliance with all state and federal regulations. To assist decision makers in making sound land-use decisions, Laboratory managers have access to more than 50 layers of environment-related information — including utility locations, building plans, and local ecosystem information — through the use of the Decision Support Application.

In planning for a sustainable future, the process includes examining potential future missions to determine how best to eliminate or avoid environmental impacts. This plan creates a sustainable future through our commitment to

- Conserve water and energy
- Increase reliance on renewable energy
- Reduce greenhouse-gas emissions
- Consolidate operations
- Reduce the facility footprint
- Practice brown-field redevelopment
- Maintain green-space buffers
- Mitigate secondary impacts from climate change



The Laboratory is located on a complex landscape of finger-shaped mesas on the slopes of an ancient caldera.

*Management and staff can use this application to efficiently evaluate the impacts to the environment for activities being considered long into the future.*

### Managing by Time Frame

