Closure for the Seventh Generation

A report from the State and Tribal Government Working Group's Long-Term Stewardship Committee | 2017 Edition

Stewardship of the U.S. Department of Energy Nuclear Weapons Complex and Legacy Waste Sites

STGWG
State and Tribal Government Working Group

NCSL

Closure for the Seventh Generation | 2017 Edition

ABOUT THE STATE AND TRIBAL GOVERNMENT WORKING GROUP (STGWG)

STGWG provides a unique forum for states and tribes affected by U.S. Department of Energy (DOE) sites and activities associated with the production and cleanup of the nuclear weapons complex. Native American tribes and states engage with DOE officials on pressing issues, lessons learned, best practices and decisions faced by DOE headquarters and field offices. This engagement with state regulators, tribal nations and other stakeholders ensures that DOE facilities and sites are operated and cleaned up in compliance with all applicable federal and state laws and regulations. It also ensures compliance with tribal rights, including those retained by treaty, and federal moral and legal obligations known as trust responsibility.

(Refer to page six for a map of member states and tribes impacted by the DOE complex.)

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ABOUT THE NATIONAL CONFERENCE OF STATE LEGISLATURES (NCSL)

Since 1989, NCSL has worked closely with DOE through a long-term cooperative agreement, the objective of which is to help states and Native American tribes understand and participate in the policies, programs and activities undertaken by the department.

NCSL is a key intergovernmental partner in advancing tribal and state priorities, especially pertaining to the cleanup, management and disposition of nuclear waste. NCSL's institutional dedication to improving intergovernmental relations across all levels of government is strong and long-standing and is proudly reflected in this report. NCSL supports additional efforts and working groups through cooperative agreements with the DOE Office of Indian Energy and Office of Nuclear Energy.

The National Conference of State Legislatures is the bipartisan organization that provides research, technical assistance and opportunities for policymakers to exchange ideas on the most pressing policy issues.

The Conference operates from offices in Denver, Colorado, and Washington, D.C.

On the cover: Fernald Preserve, 2013. Photo by Ken Niles.

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Common acronyms

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOE	U.S. Department of Energy
DOE-EM	U.S. Department of Energy Office of Environmental Management
ECs	Engineered Controls
DOE-LM	U.S. Department of Energy Office of Legacy Management
EPA	U.S. Environmental Protection Agency
FUSRAP	Formerly Utilized Sites Remedial Action Program
ICs	Institutional Controls
LTS	Long-Term Stewardship
LTS&M	Long-Term Surveillance and Maintenance
LUC	Land Use Control
NNSA	National Nuclear Security Administration
NPL	National Priorities List
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision

Acknowledgements

The State and Tribal Government Working Group (STGWG) Long-Term Stewardship (LTS) Committee appreciates the cooperation of staff at the U.S. Department of Energy (DOE), and the states and Native American tribes involved with STGWG in producing this report. We acknowledge and appreciate the efforts by DOE and emphasize the importance of continuing to provide resources to maintain adequate protections for all human health and the environment for many generations to come.

STGWG appreciates the active engagement from DOE officials at headquarters and sites across the complex for their contributions to the survey process. The commitment and support from DOE senior leadership to the 2017 edition was invaluable to the effort.

While many states and tribes and DOE assisted in this effort, we want to specifically appreciate the efforts of the writing group for this report consisting of Ken Niles of Oregon, Peter Chestnut for Pueblo de San Ildefonso, Branden Doster of Missouri and Matt Johnson of the Confederated Tribes of the Umatilla Indian Reservation, plus Mindy Bridges and Brooke Oleen of NCSL. We also thank Letitia O'Conor of DOE for her contributions including the "1999-2016 Chronology of DOE LTS related National Primary Actions" (Appendix C), and Albert Brandt Petrasek for his long-standing efforts to facilitate the dialogue among DOE and STGWG tribes and states for the benefit of our nation and future generations.

STGWG's LTS Committee looks at this 2017 edition of "Closure for the Seventh Generation" as a status report one generation after STGWG's 1999 report. The need to continue with a vision to protect seven generations into the future is ongoing. We appreciate with humility the efforts by tribes, states and DOE on their behalf.

—STGWG's Long-Term Stewardship Committee

Executive Summary

Beginning with the Manhattan Project during World War II, the federal government, through the U.S. Department of Energy (DOE) and its predecessor agencies, has been responsible for the development, production and testing of nuclear weapons at 16 major facilities and more than 100 additional sites. Once production came to an end, the work of environmental cleanup began and continues at many sites.

The selection of cleanup remedies often results in waste being left in place and a need for ongoing surveillance and maintenance to ensure the effectiveness of the remedies over time. This responsibility falls to DOE's Office of Legacy Management (DOE-LM). Today, DOE-LM has responsibility for the long-term stewardship (LTS) activities at 92 sites. Other DOE sites remain active with diverse and new missions such as national security and research.

DOE's LTS responsibilities require actions to continue protecting human health and the environment once a site is cleaned up and transitioned to a closed site or another mission. LTS activities can include protection of natural, cultural and historical resources, facilities management, maintenance of land use controls, data and record-keeping, site access considerations, and other surveillance activities. The involvement of states, Native American tribes and stakeholders does not end at site closure but must continue through stewardship.

The State and Tribal Government Working Group (STGWG), made up of states and Native American tribes, engages directly with DOE on issues related to the cleanup of the nuclear weapons complex. STGWG considers stewardship a priority issue and a key responsibility to future generations. The working group published the original edition of this report —"Closure for the Seventh Generation"—in 1999. DOE has made progress on many fronts related to LTS, most notably the establishment of DOE-LM in 2003.

This 2017 edition summarizes the progress made, including creation of this new office charged with stewardship as a core mission and several policies to protect human health and the environment. STGWG's LTS Committee, with coordination from the National Conference of State Legislatures, developed the report.

The report shares findings and conclusions from 15 DOE site surveys including successes and shortcomings in selected remedies. The recommendations presented in this report draw on progress and conclusions highlighted in site surveys completed with DOE field offices. The report serves as a framework for further discussions and continued work on these complex issues.

Key topics discussed include:

- DOE's commitment to fulfill its stewardship responsibilities across DOE offices and programs, especially for sites with new or ongoing missions that will not transition to DOE-LM.
- Involvement of states, tribes and stakeholders in the development of long-term surveillance and maintenance plans prior to transition to LTS status.
- Land use decision-making, including considerations for tribal access for traditional use and input from regulators and other stakeholders.
- Monitoring and effectiveness of land use controls, such as institutional controls (ICs) and engineered controls (ECs), including remedies to address groundwater contamination.
- Public education and awareness about site remedies, monitoring and other stewardship activities.

DOE continues its work to clean up the 16 remaining sites. Some sites may transition to other roles such as research laboratories and national security missions rather than full closure. Lessons learned from long-term stewardship progress can inform activities and decisions across the DOE complex. STGWG places emphasis on the need to develop ways to communicate knowledge and understanding to future generations. Visitor centers at Fernald Preserve and the Weldon Spring Site are good examples of facilitating transmission of knowledge and engaging with the public.

STGWG offers these recommendations for DOE's consideration to address unresolved issues facing the successful implementation of LTS. Many of the recommendations presented build upon key issues identified in 1999. Others emerged from lessons learned from closed sites and reflect a deeper understanding one generation later. The intent of this report is to provide the basis for ongoing dialogue and cooperative action on LTS among DOE, states, Native American tribes and stakeholders to protect human health and the environment for future generations.

Introduction

*"We give thanks to the Creator for these fruits of the Sea.
We ask his blessings on the food that we eat and on all generations that follow
us down to the Seventh Generation. May the world we leave them
be a better one than was left to us."*

—Harriet Starleaf Gumbs
Shinnecock

*"In our way of life, in our government, with every decision we make, we always
keep in mind the Seventh Generation to come. It's our job to see that the people
coming ahead, the generations still unborn, have a world no worse than ours
and hopefully better. When we walk upon Mother Earth we always plant our
feet carefully because we know the faces of our future generations are looking
up at us from beneath the ground. We never forget them."*

—Oren Lyons
Onondaga
*(From Wisdomkeepers: Meetings with Native American Spiritual Elders
by Steve Wall and Harvey Arden)*

For more than 45 years, the U.S. Department of Energy and its predecessor agencies developed, produced and tested nuclear weapons. At its peak, 16 major facilities and more than 100 other sites spread across the nation were involved to some degree with America's nuclear weapons program.

Four sites—Los Alamos in New Mexico, Oak Ridge in Tennessee, Hanford in Washington, and Mallinckrodt Chemical Works in Missouri—date back to the Manhattan Project in World War II. Most others became involved in the years following the end of the war as the United States greatly expanded its weapons production capability and developed an enormous nuclear arsenal during the Cold War. These sites and their diverse missions ranged from weapons research and design at national laboratories at Los Alamos and Lawrence Livermore in California; plutonium production at Hanford and the Savannah River Site in South Carolina; uranium refinement at Mallinckrodt Chemical Works and Fernald in Ohio; uranium enrichment at Oak Ridge, Portsmouth in Ohio and Paducah in Kentucky; and weapons testing in Nevada.

By the late 1980s, as the Soviet Union dissolved and the Cold War ended, various nuclear arms reduction agreements shrank both nation's nuclear arsenals, and America's nuclear weapon production facilities shut down. Because the processes used to refine and enrich uranium, produce plutonium and shape the plutonium triggers all created tremendous amounts of radioactive and hazardous wastes, the shutdown of production also prompted the start of environmental cleanup at most of these sites.

In the past nearly 30 years, cleanup has been completed at 104 of the 120 DOE sites. DOE expects cleanup at several of the remaining sites to continue until 2070 or beyond. The 16 sites still undergoing cleanup activities include Hanford, and operating sites with multiple, ongoing missions including national security and research, such as the national laboratories in Idaho Falls, Idaho, Los Alamos, Oak Ridge and Savannah River. The Nevada National Security Site (NNSS), in addition to having an ongoing mission, currently functions as a national low-level waste disposal facility for both on-site and off-site generated defense low-level waste, mixed low-level waste and classified waste.

In most cases, at least some radioactive and chemical waste remains at these sites—in engineered landfills, buried deep in the soil or in the groundwater. At some sites, extensive amounts of contaminants remain or will remain once the cleanup is completed.

Some cleaned up sites have been turned over to local control for economic development or other pur-

poses. Some sites will remain under DOE control in perpetuity. Regardless, DOE is obligated to ensure that these remaining contaminants do not harm people or the environment now or in the future. This represents DOE's responsibilities of long-term stewardship.

Overview of the 2017 Edition

The State and Tribal Government Working Group (STGWG) Stewardship Committee first published "Closure for the Seventh Generation" in 1999. This 2017 edition continues the framework of the original report and assesses progress made by DOE in addressing LTS at sites controlled by DOE that contain radioactive and chemically hazardous waste and contaminants in the soil and water.

This edition summarizes the original report's findings, conclusions and recommendations and provides updates to each of those sections based on knowledge acquired from work done from 1999 to 2017. This edition includes:

- **Progress Since the 1999 Recommendations:** This section reiterates the recommendations made by STGWG and summarizes the progress made by DOE to mitigate or address these recommendations.
- **Overview of Site Summaries:** Fifteen sites were selected to be studied by STGWG for the 2017 edition, including 10 sites from the 1999 report. The site summaries are a survey of how each site's personnel or responsible party is planning and implementing a stewardship program.
- **Findings and Conclusions:** STGWG provides findings and policy-oriented conclusions based on the new site surveys and a review of findings and conclusions from 1999.
- **Recommendations:** STGWG updates several recommendations and offers additional recommendations to mitigate the identified LTS deficiencies.
- **Appendices:** The report includes a list of acronyms, the survey form and other additional resources such as a chronology of DOE's national actions related to LTS and an overview of the history of STGWG. Site survey responses are not included in the print version of this report and can be found online.

Stewardship defined

As stated in the 1999 report, in the context of environmental management, stewardship can be defined as:

Activities necessary to maintain long-term protection of human health and the environment from hazards posed by residual radioactivity and chemically hazardous materials. Similar definitions apply to facilities that are undergoing worker transition or operating sites under routine facility management.

TERMINOLOGY

The 1999 report references long-term institutional controls (ICs) as a common remedial element at DOE sites. ICs are administrative or legal mechanisms designed to control future use by limiting development and/or restricting public access to a site where there is residual contamination. For this edition, STGWG considers land use controls (LUCs) to be those elements needed for a site to remain protective into the future. Consistent with current terminology, LUCs include both engineering controls or ECs (fences, barriers, disposal cover systems, etc.) and ICs (environmental covenants, deed restrictions, federal ownership, etc.). LTS is those actions that survey/monitor and maintain these LUCs and ensure that protection of human health and the environment is accomplished in perpetuity.

NATIONAL ACADEMY OF SCIENCES GUIDANCE

STGWG has not been alone in its efforts to study the issues of legacy waste and DOE's cleanup work. The National Academy of Sciences (NAS) produced several reports addressing DOE's management and stewardship of legacy waste sites and related activities. (See the Appendix B: Resources.)

These reports further examine critical issues also supported by STGWG, including effective long-term institutional management systems, the fallibility and uncertainty of ICs and engineered barriers, and the fact that LTS must be taken into account during each phase of environmental management cleanup activities including early LTS planning processes. A recent report from 2013—"Sustainability for the Nation: Resource Connections and Governance Linkages"—puts forward advice on issues applicable to government

Report: "Long-Term Management of U.S. DOE Legacy Waste Sites" (2000)

NAS identifies three complementary elements of waste disposition—reduction, isolation and stewardship—and that no single element can be relied upon. Long-term stewardship, broadly and systematically conceived, is essential to site disposition of waste. It requires an integrated systems approach tailored to conditions of each site and revisited over time. It requires effective organizational, financial and legal support.

NAS also concludes that effective long-term institutional management systems require:

- Accountability: The ability to be monitored and enforced.
- Transparency/visibility: Actions taken must be clearly articulated and readily accessible to public scrutiny.
- Feasibility: Avoid unwarranted institutional expectations mainly due to infeasible assumptions about site management.
- Iteration: Site disposition decisions will need revisiting in the future.[1]

This report finds almost all sites will require future oversight:

- Engineered barriers have limited lives.
- Institutional controls will fail.
- Institutional performance assessments need to be developed.
- Remediation efforts do not always account for long-term institutional needs.
- Present remediation should aim to facilitate possible future re-remediation.[2]

NAS recommends that DOE must plan for fallibility and uncertainty. Contaminant reduction and removal are preferred over isolation—a position that has long been endorsed by STGWG. Either is preferable to imposing stewardship measures that have high risks of failure. Far greater efforts are needed to ensure information about contaminated sites is preserved and communicated for future site users and visitors. Stable long-term funding mechanisms and access to other needed resources are required.

Report: "Long-Term Stewardship of DOE Legacy Waste Sites: Status Report" (2003)

NAS identifies several roles and tasks for stewardship of long-lived hazards:

- A guardian to stop activities that could be dangerous.
- A watchman to identify problems as they arise.
- A land manager to facilitate ecological processes and human use.
- A repairer of engineered and ecological structures.
- An archivist of knowledge and data to inform the future.
- An educator for affected communities to renew memory of the site's history, hazards and burdens.
- A trustee assuring financial resources to accomplish all the other functions.[3]

The report recommends incorporating LTS into each phase of environmental management cleanup activities. This involves recognizing that both natural and social environments will change at legacy sites. Involving stakeholders from the earliest phases of decisions that involve risk management and planning for fallibility—because of unforeseen events and some failures of remedies over the long-term—provides protections for future generations. Monitoring should be tailored to specific risks and circumstances of each site, while providing national-level guidance for reporting formats and record preservation protocols. Both are important for providing reliable knowledge of legacy sites, so problems can be detected and protection ensured in the long-term.

The chief recommendation is that DOE should explicitly plan for its stewardship responsibilities when making cleanup decisions and considering stewardship capabilities. DOE bears an enduring responsibility, and a corresponding liability, for problems that may arise at its legacy waste sites.

processes including LTS. The NAS discusses the development of a decision framework, which focuses on the need for an ongoing process that allows for adaptive management and improved decision-making in the longer term.

NAS and STGWG agree that DOE should select remedies recognizing that cleanup and LTS are complementary stages in long-term management of hazards that cannot be eliminated completely. Allocating risks and costs over time in ways that will protect human health and the environment over decades and centuries to come keeps focus on the distant goal of implementing LTS in ways that ensure future generations have what they need to carry out stewardship responsibilities at DOE legacy waste sites.

DOE PROGRESS

DOE has relied on physical barriers and ICs to greatly limit public access to sites with radioactive hazards. DOE continues to promote a path toward maintaining ICs and developing land use plans. Many ICs may be required for hundreds to thousands of years, necessitating a significant commitment by the federal government. These long-term ICs are important but not exclusive elements of LTS.

DOE has made significant progress in reducing the "footprint" of real estate contaminated with radioactive and hazardous waste. This footprint has been reduced from 120 sites to the remaining 16 sites with active cleanup missions under the responsibility of the DOE Office of Environmental Management (DOE-EM). Surface acreage requiring cleanup has been reduced by over 90 percent, though extensive groundwater contamination still exists beneath some closed sites. The DOE Office of Legacy Management (DOE-LM) has responsibility for sites which have been cleaned up to meet current safety standards for human health and the environment, and remain in DOE control.

Major cleanup accomplishments and progress since 1999 is summarized in the individual site summaries included in this report. DOE developed a chronology of relevant departmental actions in response to the ongoing dialogue with STGWG members on LTS. The document "1999-2016 Chronology of Department of Energy Long-Term Stewardship Related National Primary Actions" can be found in Appendix C of this report.

EM Historical Cleanup Sites

Remaining Cleanup Sites

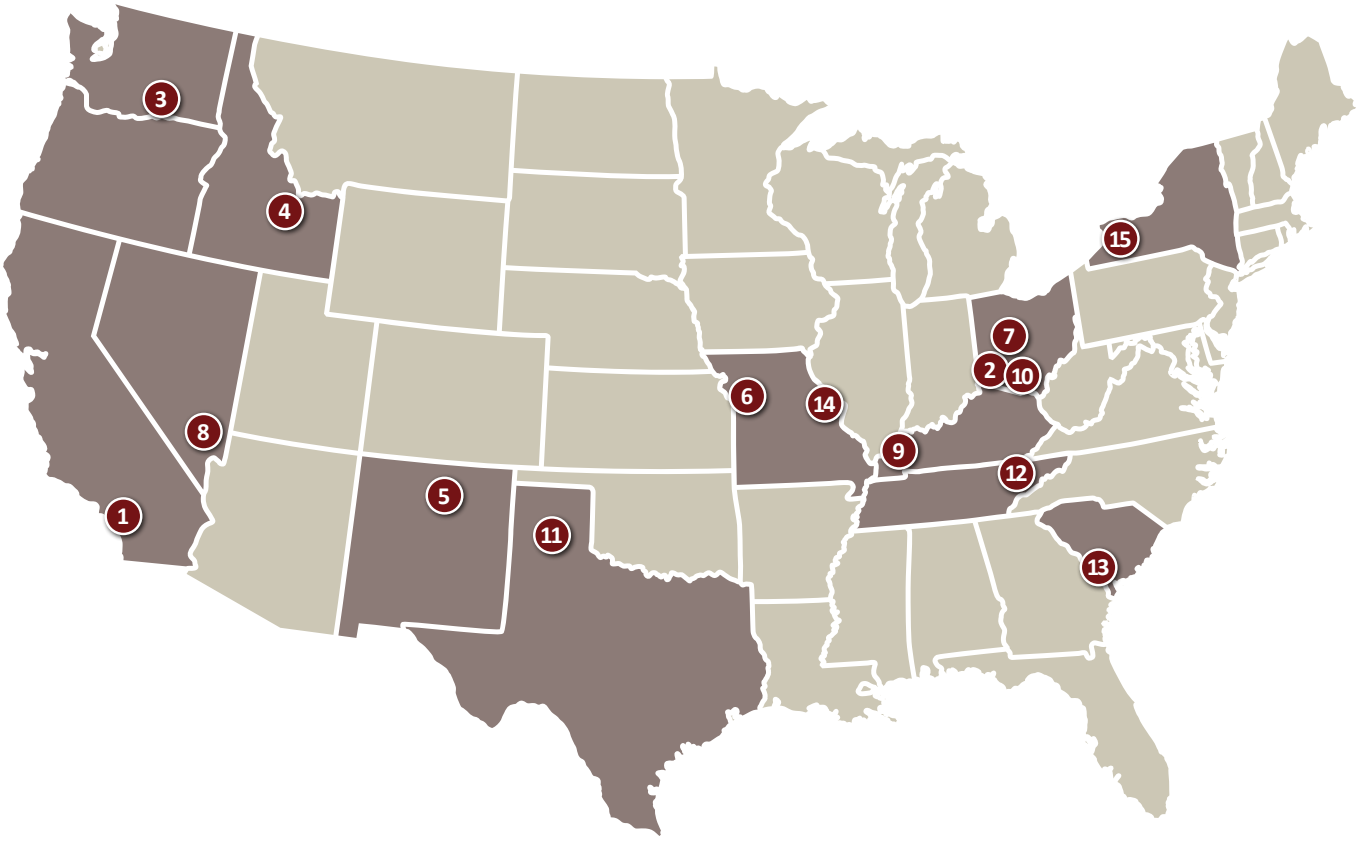
SOURCE: U.S. DEPARTMENT OF ENERGY

A notable organizational change at DOE was the establishment of DOE-LM. The office has LTS responsibility for 92 sites in 28 states and Puerto Rico, including at least eight sites that have transitioned from DOE-EM. Five sites are projected to transition from DOE-EM to DOE-LM between 2025 and 2050. Prominent among LTS sites are Rocky Flats in Colorado, Fernald in Ohio and Weldon Spring in Missouri. Fernald Preserve and the Weldon Spring Site have visitor centers to educate the public about site history as part of LTS activities.

STGWG ROLE AND VISION FOR LTS

States and tribes have worked together with DOE for over 25 years on nuclear waste cleanup. STGWG provides a forum for enhanced communication at all levels among DOE and states and tribes affected by DOE sites and activities. STGWG representatives provide recommendations to ensure that operation and cleanup activities are in compliance with all applicable federal and state laws and regulations, and tribal rights, including those retained by treaty, conferred by statute, and protected by the federal trust responsibility. Recommendations aim to protect human health and safety and environmental health.

As cleanup has progressed, the focus has shifted. STGWG created a stewardship committee in 1998



STGWG Member States and Tribes Impacted by the DOE Complex

Site		State/s	Tribes
1	Energy Technology Engineering Center	California (inactive)	Santa Ynez Band of Chumash Indians
2	Fernald Preserve	Ohio	
3	Hanford Site	Oregon Washington	• Confederated Tribes of the Umatilla Indian Reservation • Nez Perce Tribe • Wanapum • Yakama Nation
4	Idaho National Laboratory	Idaho	Shoshone-Bannock Tribes
5	Los Alamos National Laboratory	New Mexico	• Cochiti Pueblo (inactive) • Jemez Pueblo • San Ildefonso Pueblo • Santa Clara Pueblo
6	Kansas City Plant	Missouri	
7	Mound Site	Ohio	
8	Nevada National Security Site	Nevada	Consolidated Group of Tribes and Organizations
9	Paducah	Kentucky	
10	Portsmouth	Ohio	
11	Pantex Plant	Texas	
12	Oak Ridge Reservation	Tennessee	
13	Savannah River Site	South Carolina	
14	Weldon Spring Site	Missouri	
15	West Valley Demonstration Project	New York	Seneca Nation of Indians

A view from Pueblo de San Ildefonso land of Technical Area 54 used for onsite disposal and radioactive and chemical waste management at Los Alamos National Laboratory.

COURTESY OF PUEBLO DE SAN ILDEFONSO

due to states and tribal concerns about long-term actions and restrictions at DOE sites. STGWG re-established an LTS Committee in 2016 to continue to be responsive to DOE's changing priorities and expanding work of DOE-LM. Current STGWG priorities include: LTS; natural resource damage assessment and restoration (NRDAR); and tribal issues related to cleanup and closure. LTS remains a top, enduring priority for STGWG states and tribes.

DOE's input and action will provide a basis for ongoing dialogue and—more important— cooperative action, so LTS, NRDAR, and tribal considerations are woven into cleanup activities. This approach to cleanup can help DOE fulfill its responsibilities to protect human health and the environment for future generations while also potentially reducing natural resource service losses.

STGWG's vision for LTS is capable stewardship invested in protection of land and resources affected by DOE sites. LTS activities can include monitoring and maintenance of LUCs, natural resource management, facilities management, cultural resource protection, access control (patrolling), data and records management, and regular surveying.

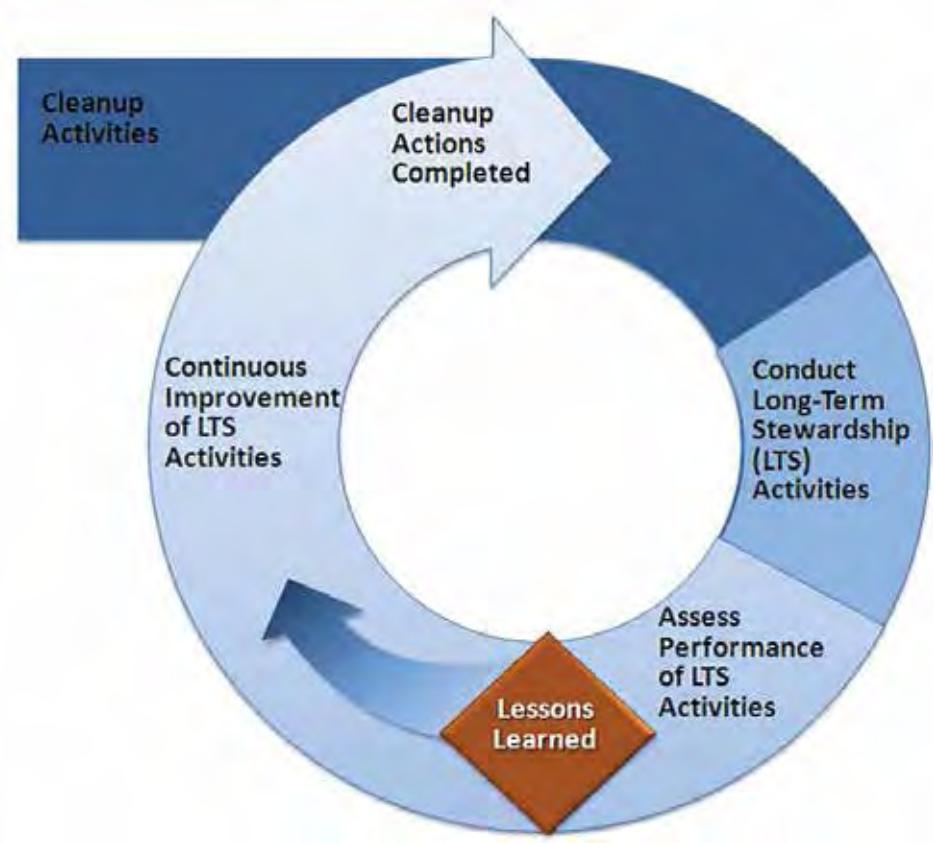
For tribes, natural and cultural resources are often one and the same. Tribes advocate for a vision of LTS with the key underpinning being the ability to ensure safe access and use of all available tribal resources, including those rights reserved under treaties, the U.S. Constitution, laws and court decisions defining the federal trust responsibility, and executive orders. The health of tribal populations is more susceptible because of site proximity to their lands and resources, which they rely on. A number of tribes and pueblos— including CTUIR, Pueblo de San Ildefonso, Jemez Pueblo and Yakama Nation—have developed their own exposure scenarios based on subsistence lifestyles to fully account for the potential health risks to tribal members from accessing and using resources at or near remediated sites.[4]

STGWG member tribes have worked with DOE for decades and continue to seek a deeper understanding and awareness of the unique tribal and cultural issues faced at the sites. DOE reaffirmed its American Indian and Alaska Native Tribal Government Policy and issued DOE Order 144.1 and framework for implementation in 2009. The policy and related documents lay out DOE's responsibilities and commitment in its interactions with tribes at headquarters and field offices. DOE has a responsibility to ensure that tribes have a seat at the table when actions that affect tribal resources are taken or when decisions are made. This fostered ability to participate in resource management and decision-making is an aspect of both the trust relationship between the United States and Native

One Tribe's Definition of LTS

The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) developed the following definition of LTS for an October 2016 workshop at the Hanford Site:

All activities necessary to ensure protection of natural, cultural, and historical resources, the health of [humans], and the environment following completion of remediation, disposal, or stabilization of a site or a portion of site. Long-term stewardship includes all engineered and institutional controls designed to contain or prevent exposures to residual contamination and waste, such as surveillance activities, record-keeping activities, inspections, resource monitoring, ongoing pump and treat activities, capital repair, maintenance of infrastructure, entombed buildings or facilities, maintenance of other barriers and containment structures, access control, and postings and maintaining signs.



Source: U.S. Department of Energy

DOE Sites by the Numbers:

8
Number of DOE-LM sites that have transitioned from EM

83
Number of DOE-LM sites that have transitioned from other entities

5
Number of DOE-EM sites projected to transition to DOE-LM (2025 to 2050)

7
Number of EM sites that will transition all or portions to other entities (i.e., NNSA, Science, NE) for ongoing or new missions

American tribes as well as tribal self-determination.

States work with DOE in regulatory and other oversight roles, which were strengthened by the Federal Facilities Compliance Act in 1992. Some states have adopted the Uniform Environmental Covenants Act (UECA) or other regulations and policies related to LUCs.[5] Various legal documents—such as consent orders and federal facilities agreements—outline states' roles and interactions with DOE regarding cleanup decisions. In addition to sites where active cleanup is underway, Missouri and Ohio—where the Weldon Spring Site, Mound Site and Fernald Preserve have transitioned to LTS status—remain involved with STGWG and provide insight into LTS implementation.

DOE needs to develop and maintain a robust LTS program to minimize risks to human health and the environment which future generations may experience from the presence of radioactive and chemical waste within the scope of the DOE complex. DOE should recognize the limits of the current LTS program and strive for a reduction in the need for LTS throughout the complex. Investments in LTS activities (including additional remedial cleanups) can minimize those risks for future generations. More consideration must be given to the fact that all engineered solutions eventually fail. LTS activities must be proactive and vigorous enough to identify potential failures before they happen and actual events as they occur.

The states and tribes of STGWG, together with DOE, share perspectives with the common goal of maximizing the ability of future generations to better understand and maintain sites in LTS status. STGWG urges DOE to address the findings and conclusions and implement the recommendations of this report by working with STGWG. STGWG looks forward to the continued strides in cleanup and stewardship activities with positive impacts for the seventh generation—and beyond.

Progress Since the 1999 Recommendations

STGWG highlighted several deficiencies in DOE's efforts to ensure adequate long-term protection of human health, the environment and cultural resources. These deficiencies were primarily focused on the topics of LTS and ICs. STGWG formulated several recommendations to guide DOE in mitigating the identified deficiencies and ensure successful implementation of LTS at DOE sites.

This section lists the recommendations from the 1999 report and highlights progress made by DOE in these areas. The chronology of DOE's national actions found in Appendix C complements this section summarizing progress made by DOE to mitigate or address past recommendations.

GOALS OF LONG-TERM STEWARDSHIP

Any accepted long-term IC or stewardship program must ensure long-term protection of human health, the environment and cultural resources.

Progress: On Dec. 15, 2003, DOE created the Office of Legacy Management (DOE-LM). The office is responsible for ensuring that DOE's post-closure responsibilities are met and providing DOE programs for long-term surveillance and maintenance, records management, workforce restructuring and benefits continuity, property management, land use planning, and community assistance.

The DOE-LM has a defined mission, several functions and six goals.[6]

Although the DOE-LM mission does include future protection of both human health and the environment, there is no specific mention of protecting cultural resources.

Many of DOE's sites have important cultural resources that must be protected through consultation early and often with interested parties and tribes. For example, cultural resources important to the Consolidated Group of Tribes and Organizations (CGTO) and representative tribal communities surrounding the NNSS are impacted by daily operations at the Area 5 Radiological Waste Management Complex Underground Test Area and soil remediation projects.

The DOE created Policy 141.1 "Management of Cultural Resources" in 2001. This policy applies to the work conducted by DOE offices and their contractors and helps DOE ensure compliance with federal laws relating to cultural resource management.

DOE Legacy Management

The DOE-LM mission is "to fulfill the Department's post-closure responsibilities and ensure the future protection of human health and the environment. Legacy Management has control and custody for legacy land, structures, and facilities and is responsible for maintaining them at levels consistent with Departmental long-term plans."[7]

LONG-TERM STEWARDSHIP PLANNING

A good stewardship program requires careful thought and planning. Simply stating that "institutional controls will be maintained" does not address even … currently identified deficiencies …. The following recommendations (#2a-#2g) propose specific actions to improve stewardship planning.

Progress: DOE has performed some LTS planning including guides, reports, policy and orders. Many are mentioned in Appendix C "1999-2016 Chronology of Department of Energy Long-Term Stewardship Related National Primary Actions" and found online at DOE-EM's LTS Resource Center.[8]

For sites that will, over time, transition from DOE-EM or other DOE programs—including the DOE Office of Science, DOE Office of Nuclear Energy (NE) and the National Nuclear Security Administration (NNSA) to DOE-LM[9]—careful thought and planning has been developed into several DOE guidance documents. They are available online at DOE-EM's LTS Resource Center and included in appendices B and C. Included is the "Site Transition Process upon Completion of the Cleanup Mission: Fact Sheet."

PHOTO BY KEN NILES

STGWG members walk from the the 41-acre disposal cell at the Weldon Spring Site.

The fact sheet explains 10 elements typically found in the LTS transition plan:

- Authorities and accountabilities are assigned and documented.
- Site conditions are accurately and comprehensively documented.
- Engineered controls, operation and maintenance requirements, and emergency/contingency planning are documented.
- Institutional controls and enforcement authorities are identified.
- Regulatory requirements and authorities are identified.
- Long-term surveillance and maintenance budget, funding and personnel requirements are identified.
- Information and records management requirements are satisfied.
- Public education, outreach, information and notice requirements are satisfied and documented.
- Natural, cultural and historical resource management requirements are satisfied.
- Business functions (including contractor benefits, if applicable) are addressed.[10]

For sites with continuing missions, long-term surveillance and maintenance (LTS&M) plans must be developed for areas within a site that contain radioactive or hazardous materials that will remain on site after cleanup activities or stabilization of each area is complete. The LTS&M plans must be to the satisfaction of stakeholders, including regulators and tribal governments.

■ **Because ICs are a significant part of many remedies, the specifics concerning the goals of the controls, the types of controls required, the manner in which the controls will be implemented, and how the controls will be maintained should be evaluated for each alternative being considered in a feasibility study.**

Progress: Some progress at sites has been observed related to ICs. At the Weldon Spring Site, DOE developed an Explanation of Significant Differences to modify the Comprehensive Environmental Response, Compensation, and Liability (CERCLA) selected remedies. It added the need for LTS, including the commitment to develop plans to detail the goals and types of controls. How the controls would be implemented and maintained while identifying who would be responsible for the long-term actions was determined. These details are found in the site's LTS&M Plan.

Many LTS&M plans at sites across the complex, such as Hanford, do not provide sufficient detail on how ICs and other long-term actions will be maintained. Cost estimates frequently do not account for funding these actions over an extended period of decades.

■ **DOE should more fully explain and quantify the required long-term cost and funding commitment required for long-term ICs.**

Progress: Some DOE sites are being addressed under CERCLA and the National Contingency Plan (NCP). These sites are often governed by Federal Facility Agreements (FFAs) that require response action to be consistent with U.S. Environmental Protection Agency (EPA) guidance.

The EPA has created guidance for planning, implementing and maintaining long-term remedies, including ICs. Important guidance includes the "Institutional Controls: A Site Manager's Guide to Identifying, Evaluating and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups, September 2000." The guide recommends that ICs be evaluated at the same level of detail (implementability, costs, durability, layering, etc.) as other components of a remedy.

Other guidance for consideration includes:

- "Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites," EPA 2012.
- "Recommended Evaluation of Institutional Controls: Supplement to the Comprehensive Five-Year Review Guidance, EPA Office of Solid Waste and Emergency Response (OSWER) Directive 9355.7-18," September 2011.
- "Implementing Institutional Controls in Indian Country," EPA 2013.
- "Long Term Contaminant Management Using Institutional Controls (IC-1)," Interstate Technology & Regulatory Council, December 2016

LM and LTS&M planning

DOE-LM analyzes long-term costs in its 75 Year Life-Cycle Baseline Estimates. The office recognizes that during remedy comparison and selection the net present value analysis does give an advantage to the ultimate selection of long-term remedies, including ICs, over more active or short-term types of remedies.

It is understood that the cost of implementing the initial IC mechanism (legal document, use restriction, covenant, etc.) can be cost effective but the cost of monitoring and surveilling of the ICs for perpetuity is not accounted for, and needs to be.

Colorado's Rocky Flats Site in June 1995 (left) before cleanup and in June 2014 (facing page). DOE completed cleanup at the site in 2005.

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■ **DOE should develop plans to ensure the availability of adequate funding for long-term ICs.**

and

■ **DOE should formally acknowledge that decisions requiring long-term ICs will not be considered final until DOE can implement an acceptable stewardship program that includes an acceptable funding mechanism.**

and

■ **Where decisions include long-term institutional controls, monitoring or maintenance, DOE should either develop a method for accurately reflecting these commitments in the decision process, or identify and emphasize the uncertainty surrounding these commitments.**

Progress: Sites that have transitioned into LTS status have benefited from the development of agreements, such as FFAs, modeled to include specific LTS components that must be maintained for decades and in some cases perpetuity.

These agreements were specifically developed to define the roles and responsibilities of DOE and other stakeholders/signatories and identify the continual, sometimes in perpetuity, obligation for funding the work.

■ **DOE should establish mechanisms for the collection, retrieval and storage of site data and information necessary for stewardship and historic preservation purposes.**

Progress: A main function of the DOE-LM is that it "preserves, protects, and makes accessible legacy records and information."[11] DOE-LM created an electronic collection, storage and retrieval system available to stakeholders online. For example, the webpage for the Weldon Spring Site provides information to the public, including fact sheets and annual site inspection reports.[12] For sites that will transition to DOE-LM for LTS, this system, if maintained, would be appropriate for most situations.

■ **DOE should continue to work with regulators and stakeholders to develop an acceptable stewardship program. Each site should develop a stewardship plan, defining constraints (anticipated and known), ongoing costs and mechanisms for implementation.**

■ **The nature of long-term activities necessarily requires that stewardship planning and implementation be an iterative process. DOE, at both the site and headquarters levels, should re-evaluate and revise stewardship plans and implementation on a routine basis to reflect decisions made and changing conditions.**

Progress: The LTS&M plans for a DOE-LM site define a process for routine analysis and iterative updates as needed. Sites are sometimes governed by agreements such as FFAs that require regulator input and approval of changes to the LTS&M plan. Periodic reviews are conducted in accordance with state and federal laws, regulations and policies.

LONG-TERM STEWARDSHIP IMPLEMENTATION

DOE sites that have ongoing missions in both defense and non-defense related areas will likely continue to make self-regulated stewardship decisions outside the DOE-EM program, under the Atomic Energy Act and the National Environmental Policy Act (NEPA). Since consistency in applying stewardship principles across the DOE weapons complex is the preferred approach, DOE needs to establish consistent policy and guidance for stewardship across all departmental programs.

■ **DOE should create a specific program office to manage stewardship responsibilities. This is needed because stewardship at DOE sites is not limited only to DOE-EM programs. Stewardship may be required during cleanup or closure and during operation of related facilities with continuing missions.**

Progress: DOE established DOE-LM in December 2003, which implements the recommendation to a significant extent, but not all sites have or will transition to DOE-LM. DOE-EM also established a cleanup to LTS site transition process for sites with ongoing missions.

■ **DOE should retain ownership of lands for which ICs are necessary to protect human health or the environment unless the affected state and/or tribe certifies that adequate institutions and legal mechanisms exist to enforce the use restrictions against subsequent owners and users.**

Progress: DOE has retained ownership of some sites, such as the Weldon Spring Site, where wastes remain in perpetuity. It has not been the case for other sites, such as the Mound Site, which has been freed up for local development.

At the Hanford Site, 1,341 acres have been turned over to the local economic development agency. DOE purposefully adjusted the boundaries of the land that was requested to avoid transferring land that was known to have residual contamination. Should there be future discoveries of contamination on this land, DOE retains liability for its cleanup.

DOE has established orders to address the management of property, facilities and infrastructure including the proper size and conditions (DOE Order 430.1). Departmental policy (DOE Policy 454.1) also has addressed the use of ICs in the ongoing management of DOE's facilities, resources and properties. DOE has made revisions in recent years to directives and policies.

■ **A successful stewardship program will require a long-term commitment of resources. Experience shows that implementing legislation facilitates maintaining such long-term commitments. DOE should continue to work with the states, tribes and other stakeholders to explore the parameters of statutory long-term stewardship.**

■ **For new construction and new facilities, the closure and long-term commitments associated with the facility should be addressed in the initial approval decision. Provisions should be made for closure and post-closure funding for the facility.**

Progress: DOE established the Real Property Asset Management Order (DOE O 430.1C), which requires consideration of LTS for new facilities.

PUBLIC EDUCATION AND AWARENESS

In accordance with "Accelerating Cleanup: Paths to Closure," DOE needs to complete the final report, "Moving From Cleanup to Stewardship," and distribute for public comment as soon as possible. This report complements "Accelerating Cleanup: Paths to Closure" and serves as a catalyst to inform stakeholders of stewardship issues. It also focuses the public education and dialogue process.

Progress: DOE-EM published the report, "From Cleanup to Stewardship," the companion report to "Accelerated Cleanup: Paths to Closure" in October 1999. The report revisits questions raised in an earlier report, "Closing the Circle on the Splitting of the Atom":

• What are we doing today that will prompt another generation to say, "how could those people—scientists, policymakers, and environmental specialists—not have seen the consequences of their actions?"

• Perhaps a question for current and future generations might be, "How do we ensure effective long-term stewardship of sites with residual waste and contamination?"

Site Summaries

For the first edition of this report, the STGWG Stewardship Committee, with support from the National Conference of State Legislatures (NCSL) and other working group member states and tribes, surveyed personnel from various sites and facilities with a role in nuclear weapons production and research. STGWG developed survey questions to determine if remedies, including long-term ICs are effective and how each site's personnel or responsible party is planning and implementing a stewardship program.

In 1999, personnel from 12 sites shared written responses to the survey. The surveys solicited information about the types of contaminants at the site, the extent of the contamination, the types of cleanup decisions being made, and steps toward defining and implementing ICs.

For this edition, 15 sites were selected, including 10 from the 1999 report. The LTS Committee collaborated with DOE to ensure a diverse sampling of sites—closed sites and sites with ongoing missions and multiple DOE offices. Survey questions were updated to reflect progress and lessons learned and understand the various waste streams and site disposal options. DOE officials provided initial data and responses to the survey questions. STGWG states and tribes were responsible for reviewing, providing comments and edits, and finalizing surveys. Most site survey responses were completed and reviewed between October 2016 and February 2017.

The site survey form can be found in Appendix E. **To view the survey responses from the 15 sites, visit www.ncsl.org/STGWG-LTS or contact NCSL staff at environment-info@ncsl.org.** The following table provides basic information for the reader who may not be familiar with each site.

Site	Location	Size	States and Tribes Involved	Current Owner/ Landlord	Current Mission	In the 1999 Report
Canonsburg - Disposal Site	Western Pennsylvania approximately 20 miles southwest of Pittsburgh, Penn.	37 acres	Pennsylvania	DOE-LM maintains a perpetual easement with the Borough of Canonsburg. Two parcels (3.531 acres) have been transferred to private ownership for beneficial reuse.	LTS by DOE-LM; Disposal	Yes
Energy Technology Engineering Center (ETEC) – part of the Santa Susana Field Laboratory (SSFL)	30 miles northwest of Los Angeles, Calif.	SSFL is 2,850 acres. DOE is responsible for 480 acres of Area IV and 182 acres of the Northern Buffer Zone.	California; Santa Ynez Chumash Band of the Mission Indians	The Boeing Company	Cleanup by DOE-EM	No
Fernald Preserve	17 miles northwest of Cincinnati, Ohio	1050 acres	Ohio	DOE-LM	LTS by DOE-LM including a visitors center	Yes
Formerly Utilized Sites Remedial Action Program (FUSRAP) - Missouri Sites	Four sites in the downtown St. Louis area and North St. Louis County area	St. Louis Downtown Site: 45 acres; St. Louis Airport Site: 21 acres; St. Louis Airport Site Vicinity Properties: acres not listed (1,218 acres estimated); Latty Avenue Properties: 11 acres	Missouri	Corporations, private entities, individuals or local governments	Cleanup by U.S. Army Corps of Engineers (USACE); Future LTS by DOE-LM	Yes
Hanford Site	Southeastern Washington north of the confluence of the Columbia and Yakima rivers	37,200 acres/ 580 square miles	CTUIR; Nez Perce Tribe; Oregon; Wanapum; Washington; Yakama Nation	DOE-EM (Richland Operations Office and the Office of River Protection); DOE Office of Science	DOE-EM Cleanup; Disposal	No
Idaho National Laboratory Site	Northeastern region of the Snake River Plain; near the cities of Idaho Falls and Pocatello in Idaho	570,000 acres / 890 square miles	Idaho; Shoshone-Bannock Tribes	DOE-NE	DOE-EM Cleanup; Research	Yes
Los Alamos National Laboratory Site	North-central N.M.; 60 air miles from Albuquerque and 25 air miles from Santa Fe	27,520 acres / 43 square miles	New Mexico; Pueblo of Cochiti; Pueblo of Jemez; Pueblo de San Ildefonso; Santa Clara Pueblo	NNSA	DOE-EM Cleanup; Disposal; National Nuclear Security Research	Yes

Site	Location	Size	Sovereign Nations Involved	Current Owner/ Landlord	Current Mission	In the 1999 Report
Maxey Flats - Disposal Site	Eastern Kentucky about 10 miles northwest of Morehead.	770 acres	Kentucky	Kentucky	LTS by Kentucky; Disposal	Yes
Mound Site	10 miles southwest of Dayton, Ohio	305 acres	Ohio	DOE-LM; 60% conveyed to the Mound Development Corporation; and 40% leased to the MDC until 2017	LTS by DOE-LM	Yes
Nevada National Security Site (NNSS)	Southeastern Nye County, Nev.; approximately 65 miles northwest of Las Vegas, Nev.	1,360 square miles / 870,400 acres	Nevada; 16 tribes—Southern Paiute, Western Shoshone, and Owens Valley Paiute and Shoshone Tribes	DOE-NNSA	Disposal; Cleanup; National nuclear security	Yes
Oak Ridge Reservation	20 miles west of Knoxville, Tenn.	33,500 acres (including three major installations - ORNL, Y-12 National Security Complex, and East Tennessee Technology Park)	Tennessee; consultations with the Cherokee tribe regarding any cultural artifacts discovered on federal land	DOE Office of Science; DOE-EM East Tennessee Technology Park and NNSA for Y-12 National Security Complex	Cleanup; Research; National nuclear security; Disposal	Yes
Rocky Flats Site	16 miles northwest of Denver	6,500 acres/10 square miles	Colorado	DOE-LM; U.S. Fish and Wildlife Service manages the Rocky Flats National Wildlife Refuge	LTS by DOE-LM	No
Savannah River Site (SRS)	Southwestern S.C.	Nearly 310 square miles / 198,344 acres	South Carolina; Catawba Indian Nation; several other federally recognized tribes have traditional territories on or near the SRS	DOE-EM	Cleanup; NNSA Research; Disposal	No
Weldon Spring Site	St. Charles County, about 30 miles west of St. Louis	Two noncontiguous areas of 217 acres and 9 acres	Missouri	DOE-LM	LTS by DOE-LM including a visitors center; Disposal	Yes
West Valley Demonstration Project (WVDP)	Western N.Y.; 30 miles south of Buffalo, N.Y.	152 acres within the 3,338 acres of the Western New York Nuclear Service Center	New York; Seneca Nation of Indians	New York State Energy Research and Development Authority (NYSERDA)	DOE-EM Cleanup; Disposal	No

Findings and Conclusions

STGWG bases these fact-based policy-oriented observations on the site surveys and the LTS progress and decisions made by DOE. STGWG's findings in 1999 focused on three general topics:

- DOE's activities resulted in widespread, long-lived contamination that is difficult to remediate.
- The sites were increasingly relying on ICs.
- Long-term funding of ICs and other stewardship responsibilities was not guaranteed and therefore was a concern.

STGWG concluded in 1999 that long-term protection of human health, the environment and cultural resources was not only the greatest challenge for DOE but should be the No. 1 goal. Other conclusions that emerged include cases that determined:

- True long-term costs of ICs were not always accurately presented.
- Future land use of those sites may be less certain than DOE asserts.
- Future use restrictions are relatively untested, leave waste in place and grow the use of ICs rather than cleanup, which places a burden on future generations.

Nearly two decades later, these findings and conclusions remain valid. DOE frequently continues to rely on ICs and strategies such as monitored natural attenuation (MNA) in lieu of active remedies. These alternatives are often chosen because upfront costs are considerably less, though long-term costs may not be fully considered. Leaving waste also limits future land use. Long-term adequate funding remains a challenge and subject to appropriation by Congress.

STGWG offers the following findings and conclusions based on the site surveys. (Numbering is intended for ease of reference and is not an indicator of ranking.)

CTUIR

The Hanford Site contains many sacred sites and other areas of cultural significance to Native American tribes.

LTS Planning Process

1. Establishing DOE-LM in December 2003 was a positive step. The office provides a mechanism and responsible program to help ensure a consistent approach across the DOE complex of safely maintaining legacy wastes well into the future. Among DOE-LM's responsibilities are environmental protection, land management and records retention at sites where DOE's mission has ended and active environmental cleanup has been completed. Since inception, DOE-LM's responsibilities have grown from 33 to 92 sites.
2. The role of DOE-LM will continue to grow in importance as additional sites are added to its purview of responsibilities, as LUCs begin to age, and as funding would be needed for LTS at an increasing number of sites.
3. It is not always clear how allocation of responsibilities for LTS will specifically be accomplished or implemented. Some DOE operating sites have not clearly defined the LTS program, thus responsibilities, such as operations and maintenance of LUCs, are not yet clarified.

KENTUCKY DIVISION OF WASTE MANAGEMENT

Maxey Flats, left, contains disposal trenches with a final landfill cap, above, and requires a long-term IC plan for at least 100 years.

4. Where DOE-EM has completed cleanup activities, LTS is not formally addressed at parts of some DOE operating sites. Following approval by regulators, lands are returned to DOE landlord responsibility while still retaining residual materials of concern.

    - Los Alamos National Laboratory (LANL) has an ongoing mission. The site includes more than 1,000 areas where cleanup is considered complete and approved by regulators. There is currently no descriptive LTS plans with implementation goals for such areas.

LTS Implementation

5. LUCs, which includes ECs and ICs, have thus far generally provided adequate protection to the public and the environment, but they have not been infallible.

    - Heavy rains in Colorado in September 2013 resulted in localized flooding at the former Rocky Flats site, damaging a landfill cover.

    - The Weldon Spring Site disposal cell has experienced vandalism that required increased surveillance and repairs to ensure LUC compliance.

6. Engineered barriers, such as fencing, gates, signage and locks, remain important LUCs, along with access and zoning restrictions.

7. Capping of radioactive hazardous waste disposal areas is an EC more widely used at some sites.

8. Recognition of anticipated failures of ICs and ECs, and the impacts of those future failures, per EPA guidance, have not been given significant consideration in the remedy choices for those sites that require hundreds of years of ICs and ECs, such as at the Hanford Site.

KEN NILES

The Fernald Preserve Visitors Center in Hamilton, Ohio, typically hosts over 12,000 visitors annually.

9. Groundwater treatment continues at numerous DOE-LM sites including, the Fernald Preserve and Rocky Flats site. To date no groundwater treatment systems have achieved remediation goals and been decommissioned, though that may occur at some point in the future.
10. In some cases, groundwater sampling frequency has been reduced due to decreasing contaminant concentrations in the groundwater.
11. Reliance on MNA continues to expand.
12. At many sites, disposal facilities/waste burial grounds will remain near significant population centers. Residential/commercial/industrial development adjacent to DOE-LM sites will likely continue to encroach closer to disposal facilities/burial grounds.
13. Contamination remaining at most DOE sites prohibits unlimited use and unrestricted exposure.
14. Future land use varies widely across the DOE complex, with some sites expected to remain, all or in large part, in DOE control in perpetuity, and other sites expected to be released for public, private or tribal use.
15. Future land use decisions continue to be made at some sites based on documentation that did not necessarily receive widespread buy-in from stakeholders (e.g., the Comprehensive Land Use Plan at Hanford).
16. Final decisions by DOE with input from states, tribes and other stakeholders for many waste sites or cleanup projects remain to be made.
17. LUC failures will likely occur, though these failures may or may not negatively impact human health or the environment.
18. Additional DOE land will likely be released for development and other private, public or tribal use.

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Consolidated Group of Tribes and Organizations (CGTO) representatives and contractors discuss the tribal revegetation work at the Nevada National Security Site (NNSS).

Tribal Issues Engagement and Public Education and Awareness

19. Access for tribal cultural, religious or ceremonial purposes and the exercising of treaty reserved rights continues to be greatly affected at DOE sites such as Idaho, Hanforn and Los Alamos, in conflict with federal laws, executive orders, treaties and federal trust responsibilities.

20. DOE supports tribal review of its surveillance and maintenance work.

21. At several sites—Maxey Flats, Mound, Rocky Flats, Weldon Spring Site—if there was not a federally recognized tribe in the state or near the site, it appears DOE did not pursue to the fullest extent possible efforts to determine whether any other tribe had historical interest or rights at the site.

22. DOE has worked with tribes to some extent in development of management plans for access to traditional cultural properties (TCPs) and other cultural resources at DOE sites.

23. The passage of time challenges DOE-LM's ability to ensure information about contaminated sites is preserved and communicated for future site users and the public.

24. It will be important for site officials to assure the public, tribes and other stakeholders that a remedy is working.

25. DOE's investment in tribal involvement for environmental monitoring and analysis, consultation with tribes early in remedy selection, and increased cultural resource access, arises from federal trust responsibilities and improves protection of human health and the environment, particularly for tribes.

26. Visitor centers at some sites (Fernald Preserve; Weldon Spring Site) have been popular and strengthened the public's understanding of the history and cleanup actions at the sites.

Recommendations

The findings and conclusions reflect DOE's progress on LTS. They also highlight the need for continued progress to address deficiencies in DOE's current efforts to ensure adequate long-term protection of human health, the environment and cultural resources. Because LTS will likely be needed at many DOE sites, STGWG has updated several recommendations and identified others to mitigate the identified deficiencies.

Any accepted LTS program and LUCs must ensure long-term protection of the environment, human health, and traditional tribal resources and cultural resources, including those protected by treaty and federal law.

Tribal members are disproportionately at risk because of the unique tribal uses of traditional resources (e.g. plants, animals) and the proximity of some tribal lands to DOE sites.

STGWG acknowledges the following recommendations may fall under the responsibilities of multiple DOE programmatic offices. Understanding that entire sites or portions of a site may not transition to DOE-LM, effective planning and consistency among DOE offices are essential.

Recommendations are organized into five general categories: Planning Process; Implementation; Funding and Budget Process; Tribal Issues and Engagement; and Public Education and Awareness. (Numbering is intended for ease of reference and is not an indicator of ranking.)

Long-Term Stewardship Planning Process

Stewardship programs require careful thought and planning.

DOE should:

1. Specify surveillance and maintenance needed in LTS plan to ensure the integrity of each remedy remains intact.
2. Provide further detail on how NNSA, DOE-NE, DOE Office of Science and other offices plan for LTS.
    - Departmental guidance should outline how states and tribes can participate in the planning processes.
3. Begin the process of developing LTS plans and other oversight mechanisms at operating and cleanup sites before completion of cleanup at any site area or parcel.
    - Consider how LTS applies to the entire site or specific site areas and the associated timelines of LTS planning and implementation.
    - Ensure that sites with ongoing missions follow the 10 elements for transition of land into LTS (as shown on page 10).
    - Ensure that LTS plans maintain flexibility while protecting human health and the environment by accounting for future changes to risk scenarios as site uses change.
4. Include LTS obligations in both its five-year planning and lifecycle cost planning as soon as possible in the process.
    - Set up a funding mechanism for state and tribal governments using approaches such as site specific advisory boards and technical assistance grants.
5. Continue to regularly review and improve the LTS program overseen by DOE-LM. States and tribes must be consulted by DOE in the development and review of these plans.
6. Create or adjust LTS plans to be robust and include modeling for extreme weather events. These plans must anticipate failure and specify actions needed if and when failure occurs.

Long-Term Stewardship Implementation

Consistency in applying stewardship principles across the DOE weapons complex is necessary.

DOE should:

7. Re-evaluate sites and portions of sites where active cleanup is complete for opportunities to define and document LTS activities.

8. Improve justifications for decisions to select long-term remedies that may include ICs and demonstrate how federal trustee responsibilities to tribes—including those for treaty rights and resources—are incorporated into LTS plans and activities.

9. Continue to establish and implement consistent policy and guidance for stewardship across all departmental programs with input from tribes, states and site stakeholders.

10. Specify how tribes, states and other stakeholders will be involved in LTS plans at each site, including operating sites. Frequency of LTS program review is site specific and should be determined with input from states, tribes and stakeholders.

11. Ensure a long-term monitoring program is in place when groundwater treatment systems are decommissioned to evaluate potential contaminant "rebound" and specify response actions.

12. Consider tribal treaty rights and fulfill DOE trust responsibility and related access rights for tribes prior to transfer of land ownership or management authority. Assure, through either legislation or policy, that such rights and resources are restored or maintained with changes in land status.

Funding and Budget Process

DOE should:

13. Determine if the current selection process of long-term remedies for its sites includes calculations for all costs related to LTS and results in truly cost-effective outcomes.

    - DOE-LM should evaluate the information and develop a report of actual cost as compared to the predicted cost of LTS.

14. Annually remind decision-makers that a more comprehensive cleanup will result in less need for LTS activities and expenditures. Annually remind decision-makers to reduce DOE's NRDAR claims exposure by removing more contamination at or below ground surface and reducing the number of hazardous waste sites/burial grounds.

15. Actively engage with regulators and tribal governments to provide funding to ensure that remedies remain safe and for public assurance that sites remain secure.

16. Continue to fund tribal programs activities related to in nuclear waste cleanup oversight, NRDAR processes, and environmental surveillance and monitoring, and provide additional funding to incorporate a cultural resource management role in LTS programs.

Tribal Issues and Engagement

DOE should:

17. Emphasize protection of cultural resources as part of DOE's mission.

    - Consider cultural resources a relevant term associated with the "environment" and integrate its importance into processes, programming and decision-making.

    - Work with STGWG to offer continued education to DOE officials and contractors on cultural resources and the federal government's trust responsibility to tribes.

18. Expand Tribal access to DOE sites for cultural, subsistence, religious or ceremonial purposes for all areas not undergoing cleanup or not directly affected by ongoing operations.

19. Improve outreach and determine historical or traditional connections for sites not currently engaged with tribes.

    - Consult the state historic preservation office to determine which tribes once lived in or near each site or could have distant ties to the land for sites not directly affecting tribes.
    - Consult the U.S. Department of Interior-Indian Affairs for current location and contact information for federally recognized descendants of those ancestors.
    - Approach tribal leadership and tribal historic preservation offices requesting consultation for description of tribal occupancy for DOE-LM closure public information records.

Public Education and Awareness

DOE should:

20. Ensure information about contaminated areas within sites is preserved, communicated and made accessible for states, tribes and future site users.

    - Seek improvements in accessibility of site LTS data/documents and continuity in data collection and storage for states and tribes using the information.

21. With stewardship required at more than 100 DOE sites because of residual waste and contamination, DOE should fulfill its previous commitment to work with states and tribes affected by sites for generations to come.[13]

22. Continue to support existing visitor centers and consider the development of additional visitor centers, as appropriate, and other methods of providing information to the public on the history and cleanup actions at a site.

23. Continue to establish separate systems for LTS data collection and preservation at operating and cleanup sites (e.g., NNSA, NE, Science) or combine with the DOE-LM system for electronic collection, storage, and retrieval of site data and documents.

Concluding Remarks

The contents of the 2017 "Closure for the Seventh Generation" continue to build a foundation for more thought and action by DOE, states, tribes and stakeholders relating to LTS. DOE will continue to make decisions impacting cleanup and LTS. It is the responsibility of DOE and all of us together as stewards of the planet and its resources to sustain them for the benefit of future generations. Our decisions and actions, or lack thereof, affect generations to come.

DOE, states, tribes and potential stakeholders should continue to come together to support and implement the LTS recommendations and policy options offered.

Appendices

Appendix A

Acronyms

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CGTO	Consolidated Group of Tribes and Organizations
CTUIR	Confederated Tribes of the Umatilla Indian Reservation
DOE	U.S. Department of Energy
DOE-EM	U.S. Department of Energy Office of Environmental Management
ECs	Engineered Controls
DOE-LM	U.S. Department of Energy Office of Legacy Management
DOE-NE	U.S. Department of Energy Office of Nuclear Energy
EPA	U.S. Environmental Protection Agency
ETEC	Energy Technology Engineering Center
FFA	Federal Facility Agreement
FUSRAP	Formerly Utilized Sites Remedial Action Program
ICs	Institutional Controls
INL	Idaho National Laboratory
LANL	Los Alamos National Laboratory
LTS	Long-Term Stewardship
LPSO	Lead Program Secretarial Office
LTS&M	Long-Term Surveillance and Maintenance
LUC	Land Use Control
MNA	Monitored Natural Attenuation
NAS	National Academy of Sciences
NCP	National Contingency Plan
NCSL	National Conference of State Legislatures
NNSA	National Nuclear Security Administration
NNSS	Nevada National Security Site
NPL	National Priorities List
NRDAR	Natural Resource Damage Assessment and Restoration
NYSERDA	New York State Energy Research and Development Authority
ORNL	Oak Ridge National Laboratory
OSWER	EPA Office of Solid Waste and Emergency Response
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
SRS	Savannah River Site
SSFL	Santa Susana Field Laboratory
STGWG	State and Tribal Government Working Group
TCP	Tribal Cultural Property
UECA	Uniform Environmental Covenants Act
UMTRCA	Uranium Mill Tailings Radiation Control Act
USACE	U.S. Army Corps of Engineers
WVDP	West Valley Demonstration Project

Appendix B

Resources

The following resources are intended to provide more background and in-depth materials for further research and understanding of the issues addressed in the report.

- Association of State and Territorial Solid Waste Management Officials (ASTSWO) Federal Facilities Research Center. *Uniform Environmental Covenants Act: Implementation at Federal Facilities*. Washington, D.C.: ASTSWO, 2015.
- Harper, Barbara, et al. "Subsistence Exposure Scenarios for Tribal Applications." *Human and Ecological Risk Assessment: An International Journal* 18, no. 4 (July 12, 2012): 810-831.
- Interstate Technology and Regulatory Council, *Long-Term Contaminant Management Using Institutional Controls* (IC-1). Washington, D.C.: ITRC, December 2016. http://institutionalcontrols.itrcweb.org/.
- National Research Council. *Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites.* Washington, D.C.: National Academies Press, 2000.
- ———. *Long-Term Stewardship of DOE Legacy Waste Sites: A Status Report*. Washington, D.C.: The National Academies Press, 2003.
- ———. *Sustainability for the Nation: Resource Connections and Governance Linkages.* Washington, D.C.: National Academies Press, 2013.
- U.S. Department of Energy Office of Environmental Management. *Accelerated Cleanup: Paths to Closure - DOE/OSTI.* Richland, Wash.: DOE-EM, 1998.
- ———. *From Cleanup to Stewardship, the Companion Report to the Accelerated Cleanup: Paths to Closure.* Washington, D.C.: DOE-EM, 1999.
- U.S. Environmental Protection Agency. *Institutional Controls: A Site Manager's Guide to Identifying, Evaluating and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups*. Washington, D.C.: EPA, 2000.
- ———. *Institutional Controls: A Guide to Planning, Implementing Maintaining and Enforcing Institutional Controls at Contaminated Sites*. Washington, D.C.: EPA, 2012.
- ———. Office of Site Remediation Enforcement, Office of Enforcement and Compliance Assurance. *Implementing Institutional Controls in Indian Country*. Washington, D.C.: EPA, 2013.
- ———. Office of Superfund Remediation. *Recomended Evaluation of Institutional Controls: Supplement to the "Comprehensive Five Year Review Guidance",* OSWER Directive 9355.7-18. Washington, D.C: EPA, 2011.

Appendix C

1999-2016 Chronology of Department of Energy Long-Term Stewardship Related National Primary Actions

This document provides STGWG with a chronology of the department's national primary actions to fulfill long-term stewardship (LTS) responsibilities since the STGWG Stewardship Committee published its 1999 *Closure for the Seventh Generation Report*.

LTS includes the physical controls, institutions, information and other mechanisms needed to ensure protection of people and the environment at sites or portions of sites where DOE has completed or plans to complete "cleanup" (e.g., landfill closures, remedial actions, corrective actions, removal actions and facility stabilization) and where legacy contamination will remain hazardous. DOE's Legacy Management (LM) program provides procedures for DOE closure sites (sites no longer in mission) and includes a combination of land-use controls, monitoring and maintenance, and information management practices.

DOE is a responsible federal land manager and steward of natural and cultural resources at DOE sites. DOE uses institutional controls for its program to manage lands, facilities, materials and resources under its jurisdiction. Many of these controls are required as part of the decision process established by various laws, such as the Nuclear Waste Policy Act; the Atomic Energy Act; the Resource Conservation and Recovery Act (RCRA); the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); and cultural resource management statutes.

To view the online version of this resource, visit www.ncsl.org/STGWG-LTS.

■ **Long Term Stewardship Resource Center**

This resource center provides the public and DOE community with a variety of LTS information resources.

http://energy.gov/em/services/communication-engagement/long-term-stewardship-resource-center

1999

■ **DOE G 430.11-2 Implementation Guide for Surveillance and Maintenance during Facility Transition & Disposition**

This memorandum provides guidance for planning the transition of long-term response action management requirements to receiving Program Secretarial Offices (PSO) once the DOE-EM program has completed its cleanup mission at a site.

https://www.directives.doe.gov/directives-documents/400-series/0430.1-EGuide-2/view

2000

■ **Report to Congress on Department of Energy Long-Term Stewardship**

DOE issued a 2000 Report to Congress containing a comprehensive analysis to date of its existing and anticipated long-term stewardship obligations at DOE sites. The report, which fulfills a congressional requirement, identifies the long-term stewardship activities anticipated by the department at as many as 128 sites by 2006.

http://www.osti.gov/scitech/biblio/1173353-report-congress-long-term-stewardship-volume-summary-report

■ **National Nuclear Security Administration**

The National Nuclear Security Administration (NNSA) was established by Congress as a separately organized agency within DOE, responsible for the management and security of the nation's nuclear weapons, nuclear nonproliferation and naval reactor programs.

https://nnsa.energy.gov/

2001

■ **DOE G 430.1-5 Transition Implementation Guide**

DOE prepared this guide to aid in the development, planning and implementation of requirements and activities during the transition phase at DOE facilities that have been declared or are forecast to become excess to any future mission requirements.

https://www.directives.doe.gov/directives-documents/400-series/0430.1-EGuide-5/view

■ **Long-Term Stewardship Study**

DOE prepared this study to comply with the terms of a settlement agreement between DOE, the Natural Resources Defense Council, and 38 other plaintiffs [Natural Resources Defense Council, et al. v. Richardson, et al., Civ. No. 97-936 (SS) (D.D.C. Dec. 12, 1998)]. The study defines LTS and describes and analyzes several issues and challenges for the department's LTS mission.

https://energy.gov/em/downloads/long-term-stewardship-study

■ **DOE P 141.1 Management of Cultural Resources**

This policy ensures that DOE programs (including the National Nuclear Security Administration) and field elements integrate cultural resources management into their missions and activities. This policy also raises awareness of and increases accountability for DOE (including NNSA) contractors regarding the department's cultural resource-related legal and trust responsibilities.

https://energy.gov/sites/prod/files/nepapub/nepa_documents/RedDont/G-DOE-DOEP1411_cult_resource.pdf

2003

■ **DOE Office of Legacy Management**

DOE-LM was established in 2003 to fulfill the department's post-closure responsibilities and to ensure the future protection of human health and the environment. DOE-LM has control and custody for legacy land, structures, and facilities and is responsible for maintaining them at levels consistent with departmental long-term plans.

http://energy.gov/lm/office-legacy-management

■ **Definition of EM Completion**

This memorandum provides additional clarification on: 1) the specific activities that must be accomplished before an environmental cleanup project is complete; and 2) the specific activities that need to be accomplished before DOE-EM responsibility for a site, or portions of a site, is complete.

http://energy.gov/em/downloads/definition-environmental-management-em-completion

■ **DOE M 413.3-1 Project Management for the Acquisition of Capital Assets**

This manual provides requirements and guidance to DOE employees on the planning and acquisition of capital assets.

https://www.directives.doe.gov/directives-documents/400-series/0413.3-DManual-1/view

■ **Site Transition Framework for Long Term Surveillance and Maintenance**

DOE-LM's Site Transition Framework provides DOE sites a comprehensive checklist to plan for the transition from cleanup to closure and LTS&M by DOE-LM.

http://energy.gov/em/downloads/site-transition-framework-long-term-surveillance-and-maintenance

■ **Transition of Long Term Response Action Management Requirements**

This memorandum provides additional guidance for planning the transition of long-term response action management requirements to receiving Program Secretarial Offices (PSOs) once DOE-EM has completed its mission at a site.

http://energy.gov/em/downloads/transition-long-term-response-action-management-requirements

■ **DOE O 430.1B Change 2, Real Property and Asset Management**

This directive establishes an integrated corporate-level, performance based approach to the life-cycle management of DOE's real property assets. It links real property asset planning, programming, budgeting and evaluation to the department's multi-faceted missions. Successful implementation of this order enables the department to carry out stewardship responsibilities, and ensures facilities and infrastructure are properly sized and in a condition to meet mission requirements today and in the future. Supersedes DOE O 430.1A Change 1.

https://www.directives.doe.gov/directives-documents/400-series/0430.1-BOrder-b-chg2/view

2005

■ **Development of Site Transition Plan, Use of the Site Transition Framework, and Terms and Conditions for Site Transition**

This memorandum, jointly signed by DOE-LM and DOE-EM, provides additional guidance on preparation of the Site Transition Plan.

http://energy.gov/em/downloads/development-site-transition-plan-use-site-transition-framework-and

■ **DOE Policy 454.1 - Use of Institutional Controls, and Guidance**

This policy ensures DOE will use institutional controls in the management of resources, facilities and properties under its control, and in implementing its programmatic responsibilities. Superseded by Change 1 (Admin Change), dated 12-7-15.

https://www.directives.doe.gov/directives/0454.1-APolicy/view

2006

■ **Terms and Conditions for EM Clean Up to the NNSA**

This document, jointly signed by DOE-EM and the National Nuclear Security Administration (NNSA), provides subject matter direction and outlines the roles and responsibilities for DOE-EM and NNSA as EM completes its legacy environmental cleanup projects at NNSA sites, and NNSA prepares for startup of its long-term stewardship activities at these same sites.

http://energy.gov/em/downloads/terms-and-conditions-em-clean-national-nuclear-security

■ **Terms and Conditions for EM Clean Up to the Office of Science**

This document outlines the terms and conditions for managing and funding site transition activities between DOE-EM and the Office of Science (SC).

http://energy.gov/em/downloads/terms-and-conditions-em-clean-office-science

2007

■ **Transitions from EM Clean Up to the NNSA**

The document outlines LTS activities at Sandia National Laboratories, Kansas City Plant and Lawrence Livermore National Laboratories (LLNL). Main site transitioned from DOE-EM to the new NNSA LTS program.

http://energy.gov/em/downloads/terms-and-conditions-em-clean-national-nuclear-security

2009

■ **Transitions from EM Clean Up to the NNSA**

The document outlines LTS activities at Pantex and LLNL Site 300 transitioned from EM to the NNSA LTS program.

http://energy.gov/em/downloads/terms-and-conditions-em-clean-national-nuclear-security

2011

■ **Institutional Controls Implementation Guide for Use with DOE Policy 454.1, Use of Institutional Controls**

This guide provides information to assist DOE program and field offices in understanding what is necessary and acceptable for implementing the provisions of DOE P 454.1, Use of Institutional Controls.

https://www.directives.doe.gov/directives/0454.1-EGuide-1/view

■ **DOE O 458.1 Change 2, Radiation Protection of the Public and the Environment**

This order establishes requirements to protect the public and the environment against undue risk from radiation associated with radiological activities conducted under the control of DOE pursuant to the Atomic Energy Act of 1954, as amended. Cancels DOE Order 5400.5 in its entirety.

https://www.directives.doe.gov/directives-documents/400-series/0458.1-BOrder-admc2/view

■ **DOE O 413.3B, Program and Project Management for the Acquisition of Capital Assets**

This order provides a) DOE Elements with program and project management direction for the acquisition of capital assets with the goal of delivering projects within the original performance baseline, cost and schedule, and fully capable of meeting mission performance, safeguards and security, and environmental, safety, and health requirements unless impacted by a directed change; and b) implements Office of Management and Budget (OMB) Circulars to include: A-11, Part 7, Capital Programming Guide, which prescribes new requirements and leading practices for project and acquisition management; A-123, Management's Responsibility for Internal Control, which defines management's responsibility for internal control in Federal agencies; and A-131, Value Engineering, which requires that all Federal agencies use Value Engineering (VE) as a management tool. Supersedes DOE O 413.3A, Change 1 dated 6-28-06.

https://www.directives.doe.gov/directives-documents/400-series/0413.3-BOrder-b/view

2012

■ **Cleanup Completion to Long-Term Stewardship at DOE On-Going Mission Sites**

This guidance document summarizes the site transition process from cleanup completion to long-term stewardship (LTS). LTS includes the physical controls, institutions, information, and monitoring and maintenance needed to ensure protection of people and the environment at sites where DOE has completed or plans to complete cleanup (e.g., landfill closures, remedial actions, removal actions and facility stabilization).

http://energy.gov/em/downloads/site-transition-summary-cleanup-completion-long-term-stewardship

■ **Long-Term Stewardship Resource Center**

This website provides the public and DOE community with a variety of LTS information resources.

http://energy.gov/em/services/communication-engagement/long-term-stewardship-resource-center

2013

■ **Site Transition Process upon Completion of the Cleanup Mission: Fact Sheet**

This fact sheet outlines DOE's internal site transition process and the terms and conditions for DOE-EM cleanup to LTS transfer to a Landlord Program Secretarial Office (on-going mission sites) or to DOE-LM for DOE closure sites.

http://energy.gov/em/downloads/site-transition-process-upon-completion-cleanup-mission-fact-sheet-september-2013

Appendix D

Overview and History of the State and Tribal Government Working Group (STGWG)

STGWG provides a unique forum for states and tribes affected by U.S. Department of Energy (DOE) sites and activities associated with the production and cleanup of the nuclear weapons complex. Tribes and states engage with DOE officials on pressing issues, lessons learned, best practices and decisions faced by DOE headquarters and the field offices. This engagement with state regulators, tribal nations and other stakeholders ensures that DOE facilities and sites are operated and cleaned up in compliance with all applicable federal and state laws and regulations and tribal rights, including those retained by treaty and those conferred by statute and trust responsibility.

History and Membership

In April 1989, 10 governors wrote a letter to Secretary of Energy James Watkins to express concerns regarding the management, cleanup and disposal of radioactive and hazardous chemical wastes at DOE facilities within or adjacent to their state's boundaries. As DOE shifted its mission from nuclear weapons production to waste cleanup, Secretary Watkins invited states, Native American tribes and national organizations to participate in a conference dealing with cleanup issues, which resulted in the formation of STGWG.

The Secretary of Energy invited each of the 10 governors to appoint a representative to STGWG, which would participate in the planning process for the department's five-year plan in May 1989. The Secretary also invited representatives from two tribes – Yakama Nation and Shoshone-Bannock Tribes – and three national intergovernmental groups – National Association of Attorneys General, National Conference of State Legislatures (NCSL) and National Governors Association. STGWG has met since 1989 and continued its dialogue with DOE on cleanup issues.

Membership in STGWG has changed over time as sites have closed. In January 1998, 16 states, eight tribes and three intergovernmental organizations participated in STGWG meetings. The working group understands the ongoing work post-closure and appreciates the participation of members and lessons learned from closed sites. Today membership includes active representatives from 11 states and 11 tribes or tribal organizations.

STGWG members participate in semi-annual meetings with the DOE Office of Environmental Management (DOE-EM) and other offices, including the DOE Office of Legacy Management, National Nuclear Security Administration, among others. STGWG engages with five other intergovernmental groups at the Intergovernmental Groups Meeting with DOE each fall.

One state co-convener and one tribal co-convener facilitate the working group with the support of a neutral party coordinator and facilitator. For over 20 years, NCSL has provided this coordination and support to STGWG through a cooperative agreement with DOE-EM.

As of October 2017, STGWG includes representatives of the following states and tribes:

- Confederated Tribes of the Umatilla Indian Reservation
- Consolidated Groups of Tribes and Organizations (affected by the Nevada National Security Site)
- Idaho
- Jemez Pueblo
- Kentucky
- Missouri
- Nevada
- New Mexico
- New York
- Nez Perce Tribe
- Ohio
- Oregon
- San Ildefonso Pueblo
- Santa Clara Pueblo
- Santa Ynez Band of Chumash Indians
- Seneca Nation of Indians
- Shoshone-Bannock Tribes
- Tennessee
- Texas
- Wanapum
- Washington
- Yakama Nation

Focus and Accomplishments

The initial activities of STGWG focused on assisting DOE in its strategic planning and budgeting process. STGWG commented on DOE's former five-year plans and provided the impetus for the former 30-year cleanup plan developed under Secretary Watkins' administration.

STGWG's focus has moved toward providing policy analysis and input regarding specific federal facility environmental cleanup issues that affect states and tribes. Meetings provide the opportunity for the unique membership, site officials and headquarter officials to come together on key issues and decision-making. STGWG has raised the visibility of the three priority areas in recent years—long-term stewardship (LTS), natural resource damage assessment and restoration (NRDAR), and tribal issues.

Accomplishment Highlights:

- STGWG produced the "Closure for the Seventh Generation" report in 1999 prior to DOE's 2001 report to Congress on LTS and the establishment of the DOE Office of Legacy Management.
- STGWG member tribes contributed to the development of the DOE American Indian Policy, Order 144.1, and the framework for implementation, and has encouraged convening regular national tribal summits and dialogues with DOE senior leadership.
- STGWG collaborated with DOE to develop a training in 2015 on NRDAR facilitated by the U.S. Department of Interior and attended by state, tribal and federal trustees.

Through a cooperative agreement with the U.S. Department of Energy, NCSL serves as an intergovernmental partner to support numerous state and tribal working groups.

For more information, contact STGWG Coordinator Mindy Bridges with NCSL's Environment, Energy and Transportation Program at mindy.bridges@ncsl.org or 303-856-1560.

Appendix E

Survey Form and Site Responses

The following text and questions were distributed to DOE field offices with the assistance of DOE headquarters. To view the survey responses from the 15 sites, visit www.ncsl.org/STGWG-LTS or contact NCSL staff at environment-info@ncsl.org. Most site survey responses were completed and reviewed between October 2016 and February 2017.

Application or Consideration of Long-Term Stewardship at DOE Sites

Site Survey Form

The following questions are intended to provide a summary of the manner in which long-term stewardship is being applied or considered at a given site or legacy waste area. It is understood that some of the questions may not apply to a particular site. Nevertheless, please attempt to answer the questions as they are presented.

Please be specific and concise in your answers and limit the responses to 10 pages in total. (Length of responses will vary greatly depending on the site.) If there is other pertinent information, attach additional sheets and/or provide web links to supporting information (e.g., CERCLA Five-Year Reviews, Land Use Control Implementation Plans, etc.).

Send your draft survey by Friday, Oct. 21, 2016, to the appropriate state and/or tribal contacts on the contact list provided with a copy to Mindy Bridges of the National Conference of State Legislatures. For Hanford, please include both Washington and Oregon, along with the respective Native American tribes.

I. Site Background and Remediation Description

a. Provide a brief description of the site. Include the site's name, location, owners (both current and future), approximate size, proximity to populated areas, and general topography features.

b. Provide a list of the American Indian tribe(s) in current proximity to the site. How are the tribes impacted by past and current site operations?

c. Describe the general contamination associated with the site. Include the types of contamination present, types of media that have been impacted, and the types and quantity of waste both before and after remedial actions were taken. Also, describe any ongoing remedial actions (i.e., groundwater pump and treat, etc.) associated with the site.
Please be concise and specific in your description, including which remedial actions were taken since 1999 to the present and those planned for the future, if any.

d. Describe any additional cleanup accomplishments undertaken or completed since 1999.

e. Describe the amount of on-site disposal of radioactive and hazardous waste already in place (in volume, curies and types of waste streams).

f. To the extent possible, describe the projected amount of cleanup (in volume, curies and types of waste streams) remaining at the site.

    i. Describe the possible amount and types of materials estimated for future disposal of hazardous and radioactive waste onsite (i.e., contaminated materials such as waste from burial grounds or building demolition debris reburied for onsite disposal after demolition, treatment, etc.).

ii. Describe the amount and types of materials estimated to be shipped off-site. What is the proposed or planned pathway(s) for treatment and disposal of the waste stream(s)?

iii. Describe the amount and types of materials estimated to remain on-site that will not be excavated and disposed of, once remediation efforts are complete (i.e., historic burial grounds left in place that may or may not be capped; contaminated pipelines left in place).

II. Decision Processes

a. State the regulatory process(es) (i.e., CERCLA, RCRA, Orders, etc.) used at the site.

b. How are the tribe(s) and/or the state(s) involved in the decision process?

c. Describe the final decision(s) for closure and the justification for not obtaining clean closure, including unrestricted use and unlimited exposure.

III. Legacy Waste and Onsite Disposal

Please answer the questions below for legacy waste areas at the site even if the site is operational or in active cleanup status.

a. What was the final land use chosen? Are there restrictions on other uses? How long are these restrictions necessary? What process was used to select the land use?

b. Describe the disposal cells and LTS activities and elements in place for the stewardship and monitoring of disposal areas.

c. What treatment technologies were considered or used prior to deciding to leave the contamination for LTS?

d. What are the specific requirements/actions associated with the LTS components? What mechanism is used to ensure that long-term operation, monitoring and institutional controls are maintained?

e. What is the LTS plan for the site? For legacy waste to remain on site, describe the monitoring and surveillance plans and procedures for LTS implementation over the next five and 75 years.

f. Briefly describe the responsibilities of all the parties involved and any agreements (i.e., MOU, consent decree, FFA, etc.) that pertain to LTS. Please specify the organization(s) responsible for enforcing the LTS components, including institutional controls and, if applicable, discuss the role of the parties (local governments, future owners, etc.) not involved in the LTS agreement.

g. Provide a summary of proposed or known funding provisions (i.e., who provides funds, how much funding is needed, how often is funding obtained, legal funding drivers, etc.) associated with the long-term stewardship, operations, monitoring, and institutional controls. Describe any additional funding for oversight activities provided to the state and/or tribe.

Notes

1. National Research Council, *Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites* (Washington, D.C.: National Academies Press, 2000).

2. Ibid.

3. National Research Council, *Long-Term Stewardship of DOE Legacy Waste Sites: A Status Report* (Washington, D.C.: The National Academies Press, 2003).

4. Barbara Harper et al., "Subsistence Exposure Scenarios for Tribal Applications," *Human and Ecological Risk Assessment: An International Journal* 18, no. 4 (July 12, 2012): 810-831.

5. Association of State and Territorial Solid Waste Management Officials (ASTSWO) Federal Facilities Research Center, *Uniform Environmental Covenants Act: Implementation at Federal Facilities* (Washington, D.C.: ASTSWO, 2015).

6. U.S. Department of Energy, *Mission* (Washington, D.C.: DOE, March 2017), https://energy.gov/lm/mission.

7. Ibid.

8. U.S. Department of Energy, , *Long-Term Stewardship Related Information* (Washington, D.C.: DOE, March 2017), https:// energy.gov/em/long-term-stewardship-related-information-0.

9. Lead Program Secretarial Offices (LPSOs) for current ongoing mission sites include the Office of Science (SC), the Office of Nuclear Energy (NE) and the National Nuclear Security Administration (NNSA).

10. U.S. Department of Energy, "Site Transition Process upon Completion of the Cleanup Mission: Fact Sheet" (Washington, D.C.: DOE, September 2013).

11. U.S. Department of Energy, *Mission*.

12. U.S. Department of Energy, "Weldon Spring, Missouri Site: Key Documents and Links" (Washington, D.C.: DOE, March 2017), https://www.lm.doe.gov/Weldon/Documents.aspx.

13. U.S. Department of Energy Office Environmental Management, *From Cleanup to Stewardship, the Companion Report to the Accelerated Cleanup: Paths to Closure* (Washington, D.C.: DOE, 1999), 53.

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