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MAPAR 2013

FISCAL YEAR 2013 MITIGATION ACTION PLAN ANNUAL REPORT FOR THE 2008 LOS ALAMOS NATIONAL LABORATORY SITE-WIDE ENVIRONMENTAL IMPACT STATEMENT

JANUARY 2014

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Title: **Fiscal Year 2013 Mitigation Action Plan Annual Report for the 2008 Site-Wide Environmental Impact Statement for continued Operation of Los Alamos National Laboratory**

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View to the southeast from the Anniversary Trail in Technical Area 72.

Los Alamos
NATIONAL LABORATORY
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Acronyms and Abbreviations

^{60}Co	Cobalt-60
^{99}Mo	Molybdenum-99
^{137}Cs	Cesium-137
^{192}Ir	Iridium-192
ALARA	as low as reasonably achievable
ANSI	American National Standards Institute
BA	biological assessment
BMPs	Best Management Practices
BRMP	Biological Resources Management Plan
CAA	Clean Air Act
CFR	Code of Federal Regulations
CMR	Chemistry and Metallurgy Research (Facility)
CMRR	Chemistry and Metallurgy Research Replacement (Facility)
CRMP	Cultural Resources Management Plan
CY	Calendar Year
DARHT	Dual-Axis Radiographic Hydrodynamic Test (Facility)
DD&D	decontamination, decommissioning, and demolition
DP	Delta Prime
DOE	Department of Energy
DSA	Decision Support Analysis tool
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMS	Environmental Management System
ENV	Environmental Protection Division
ENV-ES	Environmental Stewardship Group
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
EXID	Excavation Permit
Field Office	Los Alamos Field Office
FOD	Facility Operations Director
FONSI	Finding of No Significant Impact
FRS	Flood Retention Structure
FHWA	Federal Highway Administration
FY	Fiscal Year
HMP	Habitat Management Plan
HPSB	High Performance Sustainable Buildings
HVAC	heating, ventilation, and air conditioning
IA	Institutional Agreement
IER	Integrated Environmental Review
ILMP	Integrated Land Management Planning
LA	Los Alamos
LAC	Los Alamos County

LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security, LLC
LANSCE	Los Alamos Neutron Science Center
LASO	Los Alamos Site Office
LA-UR	Los Alamos Unlimited Release (publication)
LED	light-emitting diode
LTSESS	Long-Term Strategy for Environmental Stewardship and Sustainability
MAP	Mitigation Action Plan
MAPAR	Mitigation Action Plan Annual Report
MDA	material disposal area
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMED	New Mexico Environment Department
NMDOT	New Mexico Department of Transportation
NNSA	National Nuclear Security Administration
NPS	National Park Service
P2	Pollution Prevention
PCBs	Polychlorinated Biphenyls
PRID	Permits and Requirements Identification
PRS	Potential Release Site
Rad-NESHAP	Radionuclide National Emission Standards for Hazardous Air Pollutants
RLUOB	Radiological, Laboratory, Utility Office Building
RLWTF	Radioactive Liquid Waste Treatment Facility
ROD	Record of Decision
SEA	Special Environmental Analysis
SERF	Sanitary Effluent Reclamation Facility
SERF-E	Sanitary Effluent Reclamation Facility Expansion
SHPO	State Historic Preservation Officer
SSP	Site Sustainability Plan
SL	Southern Technical Area
SWEIS	Site-Wide Environmental Impact Statement
TA	Technical Area
T&E	Threatened and Endangered
TRU	Transuranic
TWF	Transuranic Waste Facility
UI-DO	Utilities and Infrastructure Division Office
US	United States
USFS	US Forest Service
USFWS	US Fish and Wildlife Service
VTF	Volunteer Task Force
WFMP	Wildland Fire Management Plan
WFOP	Wildland Fire Operations Plan
WIPP	Waste Isolation Pilot Plant
ZLD	Zero Liquid Discharge

Executive Summary

In Fiscal Year (FY) 2013, the United States Department of Energy/National Nuclear Security Administration Los Alamos Field Office and Los Alamos National Security, LLC Site-Wide Environmental Impact Statement (SWEIS) project office focused on tracking and managing mitigation action commitments and reporting. In FY 2013, several mitigation action commitments were completed, and this Mitigation Action Plan Annual Report (MAPAR) reflects their status and the steps taken to complete them.

Highlights for FY 2013 include the following:

- Completion and distribution of the FY 2012 SWEIS MAPAR (DOE 2013a)
- Completion and distribution of the Calendar Year 2011 SWEIS Yearbook in January 2013 (LANL 2013a)
- Numerous improvements at trail heads in Technical Areas 70 and 71 at Los Alamos National Laboratory (LANL), including new gates and informational kiosks
- Completion of rehabilitation of cultural resources impacted by the Cerro Grande Fire
- Preparation of two biological assessments and three biological reports
- Continued energy conservation and increased metering of LANL facilities
- 13 pollution prevention projects for FY 2013
- Completion of deliverables that support annual mitigation action commitments

On September 13, 2013, significant flooding occurred across the LANL site due to heavy rains. Assessments of flood damage are ongoing, and any impacts affecting the mitigations reported in this MAPAR will be evaluated and reported in the FY 2014 MAPAR.

This FY 2013 MAPAR provides a summary of progress on mitigation action commitments from October 2012 to September 2013. Appendix I, the SWEIS MAPAR tracking log, is a snapshot of accomplishments; Appendix II is the FY 2012 Dual Axis Radiographic Hydrodynamic Test Facility MAPAR; Appendix III is the FY 2013 Trails Management Plan MAPAR; and Appendix IV is the FY 2013 Special Environmental Analysis Annual Report.

1.0 Background

The first Record of Decision (ROD) for the 2008 *Final Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory* (DOE 2008a; DOE 2008b) was published in September 2008. In January 2009, the 2008 Site-Wide Environmental Impact Statement (SWEIS) Mitigation Action Plan (MAP) was finalized and included outstanding 1999 SWEIS (DOE 1999) MAP commitments, continuing mitigations from National Environmental Policy Act (NEPA) decisions made since the 1999 SWEIS, and those made in the September 2008 and June 2009 RODs for the 2008 SWEIS (DOE 2008b, 2009a). After the second SWEIS ROD was published in the Federal Register, the United States (US) Department of Energy (DOE)/ National Nuclear Security Administration (NNSA) Los Alamos Field Office (Field Office) issued a MAP Addendum (DOE 2009b). The 2008 SWEIS MAP was revised in November 2010 (DOE 2010a) and will continue to be revised to reflect subsequent changes as necessary. It is expected that the 2008 SWEIS MAP (revised in November 2010; DOE 2010b) will be revised during Fiscal Year (FY) 2014 to close out numerous mitigations that have been completed and to revise others to make them more specific and measurable. This is the fifth Mitigation Action Plan Annual Report (MAPAR) for the 2008 SWEIS.

2.0 Mitigation Action Commitments

2.1 Dual-Axis Radiographic Hydrodynamic Test Facility Mitigation Action Plan (Appendix II)

NEPA Driver:

The *Dual-Axis Radiographic Hydrodynamic Test Facility Final Environmental Impact Statement (EIS) Mitigation Action Plan* (DARHT MAP; DOE 1996) requires a DARHT MAPAR to be prepared as part of implementing the DARHT MAP. The DARHT MAPAR provides a status of specific DARHT Facility operations-related mitigation actions that have been implemented to fulfill DOE commitments under the DARHT EIS ROD (DOE 1995). The FY 2012 DARHT MAPAR reflects 13 years of DARHT Facility operations-related mitigation measures and action plans (Appendix II). The ROD for the DARHT EIS states that DOE will develop and implement mitigation measures to protect soils, water, biotic, and cultural resources potentially affected by the facility. Appendix II, the DARHT MAPAR, covers progress on mitigation action commitments for FY 2012 because in 2009 the Field Office requested that the DARHT MAPAR be published as an appendix to this document.

Mitigations:

1. Arrange (at least once a year) for Tribal Officials to visit cultural resource sites within Technical Area (TA) 15 that are of particular interest to the tribes.

2. Reduce annual surveillance sampling schedule to soils and one additional medium.
3. Include emissions data from contained experiments and comparisons with results from previous operations, starting in 2001, in the 2009 SWEIS MAPAR.

Actions Taken:

In FY 2012, there were no significant impacts from contaminants based on measurements of soil, sediment, vegetation, field mice, and bees from DARHT operations. Also, the comparison of bird species diversity and composition, a qualitative measurement, before and during DARHT operations, showed no significant impacts to bird populations.

Although 2012 contaminant levels were not at concentrations detrimental to human health or to the environment, there were still measurable amounts of depleted uranium in all media, and the levels were increasing over time until at least 2006. Concentrations of depleted uranium in most media decreased in 2007 and may correspond to the success of employing steel containment vessels and/or to a reduction of detonations. However, since increases of uranium in all media were noted until at least 2006 and uranium may linger in soils for some time, the monitoring of all or part of these media should be continued to a point where the concentrations are similar to baseline statistical reference levels.

Foam mitigation significantly reduced the amount of potential contaminants released into the environment compared with open-air detonations, the use of steel containment vessels further reduced those amounts beyond the use of foam mitigation.

The natural environment is having a greater effect on the deterioration of the standing wall architecture at Nake'muu (an Ancestral Pueblo multi-room dwelling) than operations at DARHT.

Effectiveness of the Program and the Mitigations:

In FY 2012, there were no significant impacts from contaminants based on measurements of soil, sediment, vegetation, field mice, and bees from DARHT operations. Also, the comparison of bird species diversity and composition, a qualitative measurement, before and during DARHT operations, showed no significant impacts to bird populations. Mitigation 1 is effective and tours are conducted when requested, Mitigation 2 was completed in 2009 and annual sampling continues under the reduced sampling schedule, and Mitigation 3 was completed in 2010.

Recommendation:

Tours of Nake'muu will continue to be arranged and conducted as necessary. Maintenance visits of Nake'muu will also be conducted as necessary. It is

recommended that Mitigations 2 and 3 be closed through the Field Office. The Los Alamos National Laboratory (LANL) Environmental Stewardship Group (ENV-ES) will continue annual sampling at DARHT.

2.2 Trails MAPAR (Appendix III)

NEPA Driver:

In accordance with the 2003 *Environmental Assessment for the Proposed Los Alamos National Laboratory Trails Management Program* (DOE 2003), LANL continues to implement a MAP and MAPAR for this Environmental Assessment (EA) through the Trails Management Program.

Mitigations:

1. Complete eligibility evaluations for historic trails under the National Historic Preservation Act (NHPA) and identify additional environmental issues on trails use.
2. Evaluate and manage trails to determine appropriate closures and/or restrictions.
3. Prepare management plans for trails in TAs-70 and -71.
4. Support the use of volunteers for selected trails maintenance projects at LANL.

Actions Taken:

The Trails Working Group met 11 times in FY 2013 and held its 91st meeting in September 2013. Typically, Trails Working Group attendees include subject matter experts from Los Alamos National Security, LLC (LANS); representatives from Los Alamos County, nearby Pueblos, Bandelier National Monument, the Santa Fe National Forest; and local residents.

In the spring of 2013, the Cultural Resources Team discovered that a large archaic lithic scatter, LA 139481, in TA-71 was being impacted by equestrians and hikers. LA 139481 is a rare archaic lithic scatter (1 of 11 at LANL) with an abundance of artifacts and hearth stains that is experiencing erosion due to several trails that cut through the site. Members of the cultural resources team completed efforts to reroute the trail to avoid the site. However, barriers and signage had been removed, or ignored, and the area continued to see trail use. Cultural resources staff repaired, or replaced, "TRAIL CLOSED" signs and made additional efforts to block the existing trails inside the site boundary by placing branches and other debris across trails to discourage use and to act as erosion controls. Unfortunately, the repaired and replaced signage and barriers were also removed by trail users.

These issues were presented and discussed at the monthly Trails Working Group meetings to educate and dissuade the use of the trails within the site and protect the

cultural resources. A public meeting was held in June 2013 to inform residents of trail use and issues regarding the disturbance of cultural resources at TA-71. The public was also informed of additional patrols by the National Park Service (NPS), official access points and information kiosks, and the installation of boundary fencing to define DOE property. Continued monitoring of the site indicates that most of the trail closures are now being respected. Additional fencing was installed across trails and a boundary fence was placed in areas behind private properties to restrict access to LA 139481.

In June 2013, a public meeting was held in White Rock regarding issues with trails use, cultural resources, and stewardship efforts in TAs-70 and -71. Topics included an overview of trails and trail etiquette, resource protection requirements and proposed area closures, designs for fencing and kiosks, fire conditions, restrictions and the area closure process, NPS patrols and trails use rules, unexploded ordnance, and where to find trail information. In order to provide more information to the public, the Trails Management Program has revamped its external website. The updated public website can be found at http://www.lanl.gov/community-environment/environmental-stewardship/protection/trails.php. There is also a Trails Blog for LANS employees to comment on trails conditions and updates at http://blog.lanl.gov/trails/.

One FY 2013 goal of the Trails Working Group was to upgrade and standardize trailhead portals, signs, and general appearances in TAs-70 and -71 to more clearly communicate the responsibilities of trails users. Twelve trailhead gates, fences, and kiosks were installed and other existing trailheads were closed. Additionally, pursuant to an agreement between DOE and NPS, Bandelier National Monument rangers have patrol and enforcement authority on LANL trails in TAs-70 and -71 under 36 Code of Federal Regulations (CFR).

The Trails Management Program coordinated with the Integrated Environmental Review (IER) Program to integrate a notification in the Permits Requirements Identification (PRID) and Excavation Permit (EXID) systems, so that projects know when they are within 100 yards of the LANL boundary. This notification became necessary when an erosion control project on LANL property impacted trails on US Forest Service (USFS) property because they were unaware of their proximity to the LANL boundary.

In September 2013, the Anniversary Trail, situated in TA-72, was damaged when a Los Alamos County (LAC) subcontractor bypassed access controls at the trailhead and operated a drill rig on the property. Subsequent investigations and discussions between the Field Office, LANS, and LAC established that LAC and its subcontractor(s) will repair the damage, and that further coordination between DOE, LAC, and LANS for projects occurring on DOE property will be conducted prior to work initiation.

In FY 2013, the Volunteer Task Force (VTF) Board notified the Trails Working Group that they had decided not to sign the revised Institutional Agreement (IA) between LANS and the VTF. The VTF Board cited the costs of insurance coverage required in the agreement, limited resources, and competing priorities in their decision not to sign the IA. Alternatives for continuing the use of volunteers to repair and maintain trails at LANL are being explored in light of this decision.

Details regarding FY 2013 implementation of the Trails MAP are provided in Appendix III.

Effectiveness of the Mitigations:

Mitigation 1: Effective and ongoing. Numerous activities were undertaken in FY 2013 to manage archaeological sites near trails (see Appendix III, Sections 3.1 and 3.3).

Mitigation 2: Effective and ongoing. Numerous activities were undertaken in FY 2013 to manage trails (see Appendix III, Sections 3.1 and 3.3).

Mitigation 3: The actions associated with this mitigation have been integrated into the revised Draft Cultural Resources Management Plan (CRMP) and future work will continue under the CRMP once it is finalized. It is recommended that this mitigation remain open until the CRMP is finalized.

Mitigation 4: Effective and ongoing. A new IA was established in FY 2013.

Recommendations:

Complete a Trails Management Plan for TAs-70 and -71 in FY 2014 to include a strategy for Mitigation 1 and a plan for trails maintenance (Mitigations 2 and 4). Mitigation 3 will remain open until the CRMP is finalized.

2.3 Special Environmental Analysis (Appendix IV)

NEPA Driver:

Mitigations were identified in the *Special Environmental Analysis for the Department of Energy, National Nuclear Security Administration: Actions Taken in Response to the Cerro Grande Fire at Los Alamos National Laboratory* (DOE 2000a) to mitigate actions taken in response to the Cerro Grande Fire. The Special Environmental Analysis (SEA) annual report is now published as part of the 2008 SWEIS MAPAR (Appendix IV). DOE/NNSA issued the SEA in September 2000 pursuant to the Council on Environmental Quality regulations implementing NEPA under emergency circumstances and regulatory requirements to provide an analysis of the Cerro Grande Fire emergency fire suppression, soil erosion, and flood control actions taken by DOE/NNSA and LANL between May and November 2000. DOE/NNSA also identified mitigations for these

actions. While a majority of the mitigations have been completed, the FY 2013 SEA annual report (Appendix IV) provides information on the status of the commitments.

Mitigations:

1. Monitor biota and sediment contamination behind the Los Alamos Canyon Weir and the Pajarito Canyon Flood Retention Structure (FRS) and report results in the Annual Environmental Report.
2. Periodically remove sediment from the Los Alamos Canyon Weir based on sedimentation rate and contamination accumulation rate.
3. Complete rehabilitation of cultural resources impacted by the Cerro Grande Fire.

Actions Taken:

Samples of small mammals and vegetation for radionuclide, heavy metals, and polychlorinated biphenyls (PCBs) were collected from the Los Alamos Canyon Weir and from the Pajarito Canyon FRS in FY 2013 and submitted for analysis.

Cleanouts of the Los Alamos Canyon Weir are performed periodically to stabilize potentially contaminated sediments. The FY 2013 cleanout included removal of 6,000 cubic yards of sediment from behind the weir, which was then relocated on site and stabilized. Additional cleanouts will be required in FY 2014 because of flooding that occurred in September 2013. These will be reported in the FY 2014 SWEIS MAPAR.

SEA fieldwork and reporting has focused on the 96 prehistoric archaeological sites, 14 historic homestead-era sites, and 13 historic buildings needing additional rehabilitation work or other follow-up actions as a result of the fire and subsequent flooding (Nisengard, et al. 2005). Since then, affected cultural areas have been revisited annually and many rehabilitation projects have been conducted. Over the course of the SEA project, work to mitigate the damage to prehistoric (Ancestral Pueblo) sites has included removing burned snags and downed trees, installing straw wattles, filling stump holes, re-vegetating sites using native seeds, repairing fences, and installing new fencing.

Rehabilitation work at homestead-era sites and at historic building areas has included tree and vegetation removal, erosion control projects, fence repair and barrier installation, repairs to building areas (including the stabilization of burned structures), evaluation of burned artifacts, in-field artifact analysis, and the reevaluation of National Register of Historic Places eligibility for extensively damaged sites.

Each year, as part of the SEA monitoring and reporting process, archaeological sites and historic buildings are removed from the annual monitoring list once they are stabilized and erosional risks or other potential impacts have been mitigated. In FY 2013, the SEA project ended and most of the cultural resources initially identified for monitoring or

rehabilitation work no longer require annual monitoring. Future monitoring and repair work will be conducted as part of implementation of the CRMP.

Effectiveness of the Mitigations:

Mitigations 1 and 2 are effective and ongoing. Mitigation 3 is complete and any further work will be managed under the existing CRMP.

Recommendations:

Biota and sediment sampling from behind the Los Alamos Canyon Weir and the Pajarito Canyon FRS will continue annually. Additional cleanouts from behind these structures will likely be required in FY 2014 because of flooding that occurred in September 2013. It is recommended that Mitigation 3 be closed through the Field Office.

2.4 Flood Retention Structure

NEPA Driver:

These mitigations are from the *Environmental Assessment for the Proposed Future Disposition of Certain Cerro Grande Fire Flood and Sediment Retention Structures at Los Alamos National Laboratory, Los Alamos, New Mexico*, 2002, DOE/EA-1408 (DOE 2002a).

Mitigations:

1. Annually monitor the FRS for structural integrity and safe operations until removed.
2. Remove portions of the FRS in accordance with DOE/EA-1408.
3. Recycle demolition spoils from FRS decontamination, decommissioning, and demolition (DD&D) as appropriate.
4. Consider leaving an aboveground portion of the FRS equivalent to the dimensions of a low-head weir to retain potentially contaminated sediments on LANL land.
5. Remove aboveground portions of the steel diversion wall below the FRS.
6. Re-contour and reseed disturbed areas to protect surface water quality in Pajarito Canyon after the FRS is removed.

Actions Taken:

The annual inspection of the Pajarito Canyon FRS was conducted May 21, 2013 (UI-RPT-003, R3). From the inspection report: *"Observation from this inspection noted only minor changes from the inspection performed on June 7, 2012. The structure does not have any obvious, significant structural deterioration and appears to be in good condition considering the*

construction method used and expected structure longevity. No corrective actions are recommended at this time."

Effectiveness of the Mitigation:

Mitigation 1 is effective and annual inspections of the FRS will continue. The remaining mitigations are on hold pending removal of the FRS.

Recommendation:

It is recommended that the annual inspections of the FRS continue. The remaining mitigations are on hold until Area G is ready for capping because the material generated by the FRS removal could be used to partially cover Area G.

2.5 Outfall Reduction Initiative/Radioactive Liquid Waste Treatment Facility

NEPA Driver:

This mitigation stems from the 2008 SWEIS commitment related to outfall reduction as specified in the 2009 ROD for the 2008 SWEIS. The EA and a mitigated Finding of No Significant Impact (FONSI) for the Sanitary Effluent Reclamation Facility Expansion (SERF-E) project were issued in August 2010 (DOE 2010b, c). The mitigation action commitments associated with the 2010 mitigated FONSI (DOE 2010c) also addressed impacts to Sandia Canyon. A biological assessment (BA) for the 2008 SWEIS (LANL 2006a) also contributed to the development of this mitigation.

Mitigation:

1. All further actions affecting water flow volumes in Mortandad and Sandia Canyons will be assessed for positive and negative impacts.

Actions Taken:

Operation of the expanded Sanitary Effluent Reclamation Facility (SERF) commenced in August 2012. The facility provides a blend of reclaimed effluent from the Sanitary Wastewater System Plant and well water to cool the supercomputers housed in the Nicholas Metropolis Center. Current estimates indicate that up to 110 million gallons of water could be provided annually.

No cooling tower water blow down or SERF product water has been diverted from Sandia Canyon. Therefore, no mitigations associated with hydrologic changes to the S-2 reach of Sandia Canyon have been required. A study to determine how much water is needed to maintain healthy wetlands in Sandia Canyon was completed in 2012. The study examined acceptable flow reductions and intensity combined with corrective actions to divert remaining flow to sufficiently maintain wetland viability and reduce soil erosion. Total discharges into Sandia Canyon from each of the three permitted

outfalls have decreased by roughly 19 percent compared to FY 2012. Yearly total flow data is available in the annual Environmental Report and the annual SWEIS Yearbook.

DOE and LANS are committed to outfall reduction and the mitigation initiatives associated with the Radioactive Liquid Waste Treatment Facility (RLWTF) Upgrade Project. The RLTWF outfall into Mortandad Canyon is still permitted, but there has been no discharge to the canyon since November 2010. The Zero Liquid Discharge (ZLD) portion was completed in October 2012. Operation of the ZLD is anticipated with the approval of the updated State of New Mexico ground water permit expected in December 2013.

Effectiveness of the Mitigation:

This mitigation is effective and work will continue. The draft ground water permit is currently out for public comment.

Recommendation:

As per LANS policy, ensure PRID and EXIDs are completed for projects potentially impacting canyons.

2.6 Off-Site Source Recovery Project

NEPA Driver:

This mitigation is derived from the 2008 ROD for the 2008 SWEIS.

Mitigation:

1. Institute adequate controls on the quantities and methods of storing sealed sources containing Cobalt-60 (^{60}Co), Iridium-192 (^{192}Ir), or Cesium-137 (^{137}Cs) to mitigate the effects of potential accidents.

Actions Taken:

The LANL Off-Site Source Recovery Project does not currently accept sealed sources containing ^{60}Co, ^{192}Ir, or ^{137}Cs, the sources for which mitigation measures were identified in the 2008 SWEIS MAP.

Effectiveness of the Mitigation:

This mitigation is on hold.

Recommendation:

None at this time.

2.7 Sanitary Effluent Reclamation Facility Expansion

NEPA Driver:

This mitigation is derived from the MAP and FONSI (DOE 2010c) for the SERF expansion project EA (DOE 2010b), DOE/EA-1736, and the 2008 SWEIS ROD (DOE 2008b).

Mitigation:

1. Implement the SERF MAP.

Actions Taken:

Construction of the expanded SERF is complete, and mitigations associated with SERF-E are also complete. Mitigations associated with the S-2 reach are ongoing. See Section 2.5 above for additional details.

Effectiveness of the Mitigation:

This mitigation is effective.

Recommendation:

Continue to implement mitigations associated with the S-2 reach.

2.8 Air Emissions

NEPA Driver:

These mitigations are derived from the 2008 SWEIS MAP and the Clean Air Act (CAA) Title V (42 U.S.C § 7661 et seq.) site-wide permit No: P100-R1-M1.

Mitigations:

1. Continue air-monitoring program to comply with the CAA, including monitoring radiological air emissions. Monitor and track Los Alamos Neutron Science Center (LANSCE) emissions to maintain the annual dose to the public under the administrative limit.
2. Use existing PRID program and other tools to assess potential air quality impacts from new or modified projects and provide best management practices (BMPs) to control emissions (e.g., maintaining construction equipment and routine watering or eco-friendly chemical stabilization to control fugitive dust).
3. Removal of contamination from material disposal areas (MDAs) and other potential release sites (PRSs) would be conducted in a manner that protects the environment, the public, and worker health and safety.
4. Removal of waste from some large MDAs may require the use of temporary containment structures to limit possible releases of contaminated material to the

environment to levels within applicable standards and as low as reasonably achievable (ALARA).

Actions Taken:

LANS implements and complies with the Title V site-wide permit No: P100-R1-M1 as required by the CAA. LANS conducts continuous emissions monitoring at 29 major exhaust stacks emitting airborne radionuclides and tracks operations from more than 50 other minor stacks. The annual maximum off-site dose for Calendar Year (CY) 2012 was 0.58 millirem; the EPA limit is 10 millirem per year (results are reported on a calendar-year basis, thus the CY 2013 results are not yet available). In addition to stack monitoring, the program also operates more than 40 air sampling stations, measuring concentrations of radioactive material (if any) in ambient air at public receptor locations. Radiological doses routinely measured by these stations range from 0.05 to 0.50 millirem, well below Environmental Protection Agency (EPA) limits.

In June 2013, the annual Radionuclide Air Emissions report for 2012 (DOE 2013b) was transmitted to the Field Office and then to the EPA Region 6, describing emissions of airborne radionuclides from LANL operations in 2012.

In 2012, several air-sampling stations, which were not part of the regulatory compliance program, were identified for shutdown. Twelve stations were shut down at the end of September 2012; these stations represent areas where there is no obvious source of radiological emissions or stations where there are other stations nearby that can provide comparable measurements. The set of stations used to demonstrate compliance with the Radionuclide National Emission Standards for Hazardous Air Pollutants (Rad-NESHAP) are not affected by this decision; these compliance stations remain in continuous operation.

One of the Airnet compliance stations, Los Alamos Inn – South Station 257, is located on private property. This property went into foreclosure, and power was cut to the station by local utilities in November 2012. This area is located on the rim of Los Alamos Canyon above a legacy contamination site, and Station 257 routinely measures among the highest air concentrations in the Airnet network. To continue measurement of air concentrations at this location, a new sampling location was immediately established on the edge of Los Alamos Canyon above and downwind of legacy contamination sites.

The Chemistry and Metallurgy Research (CMR) Facility at TA-3 has 14 monitored exhaust points. The first of these to be shut down is the fan associated with Exhaust Stack-37. Radiological operations requiring ventilation are no longer being conducted in areas exhausted by this system. After the fan was shut down, the emissions sampling system was decommissioned on November 1, 2012.

In October 2012, LANL notified EPA of intent to start a new stack sampling system at TA-55, Building 400, the Radiological Laboratory, Utility, Office Building (RLUOB). This building is the first phase of the Chemistry and Metallurgy Research Replacement (CMRR) Facility. Effective November 15, 2012, the building is being managed as an active stack in the Rad-NESHAP program, including continuous stack sampling and routine flow measurements.

Also in October 2012, LANS notified EPA of intent to start a new radiological operation in late 2012 at TA-54, Dome 375. This facility is a new source, expanding LANL's radioactive waste processing and repackaging operations. Operations began on March 4, 2013. Appropriate notifications were provided to EPA Region 6. The stack is sampled for radiological particulate emissions with a system meeting America National Standards Institute (ANSI) N13.1 criteria.

In the fall of 2012, the processing enclosure inside Dome 231 at TA-54 was expanded. The ventilation system capacity was increased by about 75 percent. Testing in 2011 demonstrated that that even with the higher stack flow, the sample system still meets ANSI N13.1 design criteria. Stack emissions are continuously sampled for particulate airborne emissions.

Late in 2012, LANS began small-scale proof of principle tests to determine viability of producing Molybdenum-99 (^{99}Mo) at the accelerator facility. This experiment involves irradiation of uranium solution at LANSCE, then processing the samples at other LANL facilities (the CMR building and the TA-48 Radiochemistry Facility). The levels[1] involved with initial tests in 2012 and 2013 are extremely low, and anticipated doses are well below the 0.1 millirem threshold that would require any EPA notification. In 2012, no emissions related to ^{99}Mo production experiments were detected on monitored stacks at LANSCE, CMR, or TA-48.

Effectiveness of the Mitigations:

LANL complies with the CAA and operates under a Title V site-wide permit No: P100-R1-M1. The mitigations are effective.

Recommendation:

Because the Air Quality Program at LANL is mature and self-sufficient, it is recommended that all these mitigations be closed. Air quality will continue to be monitored per the requirements of the CAA Title V site-wide permit No: P100-R1-M1.

[1] "Levels" refers to the quantities of radionuclides involved with the proof-of-principle testing (before and after irradiation); the potential emissions from these small quantities of radioactive materials being irradiated; and the resulting off-site doses from the small potential emissions from the small quantities of radioactive material being irradiated.

2.9 Wildland Fire Management Plan

NEPA Driver:

These mitigations are derived from the *Environmental Assessment for the Wildfire Hazard Reduction and Forest Health Improvement Program at Los Alamos National Laboratory* (DOE 2000b), the 2008 SWEIS and SWEIS MAP, DOE's Wildland Fire Management Program (DOE 2004), and the 2001 Federal Wildland Fire Management Policy and Implementing Actions (DOE Order 450.1; [DOE 2008c]).

Mitigations:

1. Implement Wildland Fire Management Plan (WFMP) with adequately funded ongoing program. (Note: this plan is now called the Wildland Fire Operations Plan [WFOP])
2. Continue to further reduce wildfire risks by shipping legacy transuranic (TRU) waste, currently stored in the TA-54 domes, to the Waste Isolation Pilot Plant (WIPP).

Actions Taken:

LANS implements an annual Wildland Fire Management Plan (a.k.a. the Wildland Fire Operations Plan). In FY 2013, fire road and firebreak inspection programs were established to identify a schedule of inspection periods and coordination with the Facility Operations Director (FOD) to ensure road maintenance and repairs are completed. Work packages were developed identifying at least 400 acres for fuels treatment. These work packages include PRID, treatment prescription, maps, and detailed work descriptions. Monthly Fuel Prescription Inspection reports for firing sites were submitted for April through September. The Site-Wide Wildland Fire Risk Assessment was updated providing fire managers a comprehensive tool to develop fuel treatments and predict fire behavior based on real time/site conditions. The FY 2014 Wildland Fire Management Operations Plan was completed and submitted to the Field Office. In addition, approximately 180 acres of Defensible Space/Urban Interface treatments in anticipation of the forecast extreme fire season have been completed.

To reduce wildfire risks, shipments of legacy waste to the WIPP are ongoing. To date, 2,745.6 cubic meters of TRU waste have been shipped as part of the 3706 Campaign.

Effectiveness of the Mitigations:

These mitigations are effective and ongoing. Mitigation 1 results in the creation of defensible space and removes excess fuel from LANL property. Mitigation 2 removes aboveground waste that could contribute to human health impacts in the case of a wildfire.

Recommendation:

Continue to implement the annual plans to mitigate wildfire risks and continue accelerated shipments of waste to WIPP.

2.10 Environmental Justice

NEPA Driver:

These mitigations stem from the 2008 ROD for the 2008 SWEIS. Some members of the public from surrounding communities (including nearby Pueblos) expressed concerns (during the SWEIS comment period) about the adequacy of the environmental justice analysis contained within the 2008 SWEIS. Some members of the public who commented requested assurances that DOE/NNSA would meet the requirements of Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (EO 1994). Currently, DOE/NNSA is implementing the EO and is meeting its objectives.

Mitigations:

1. Continue consultations and both formal and informal public meetings.
2. Improve upon and implement effective communications strategies to provide fair and equitable sharing of information about LANL operations to surrounding minority and low-income communities.

Actions Taken:

In FY 2013, DOE/NNSA continued consultations and formal and informal public meetings regarding proposed projects at LANL. LANS continues to implement EO 12898 through its Community Commitment Plan and associated programs, the LANS Regional Purchasing Plan, the LANS Small Business Plan, and the LANS Diversity Plan, as stipulated in the LANS Prime Contract. In February 2013, in response to DOE Legacy Management request, ENV-ES and Community Programs Office staff worked with the Field Office to provide recommendations on ways to improve DOE environmental justice outreach tools for communicating data for the public about site activities.

Effectiveness of the Mitigations:

Both of these mitigations are complete.

Recommendation:

It is recommended that both mitigations be closed. Environmental Justice will continue to be assessed through the normal NEPA process associated with LANL projects as well as the Community Commitment Plan and associated programs, the LANS Regional Purchasing Plan, the LANS Small Business Plan, and the LANS Diversity Plan.

2.11 Site-Wide Environmental Impact Statement Biological Assessment

NEPA Driver:

These mitigations are derived from the BA for the 2008 SWEIS, (LANL 2006a). The LANL *Threatened and Endangered Species Habitat Management Plan (HMP) for Los Alamos National Laboratory* (LANL 2011a) provides a management strategy for the protection of threatened and endangered species and their habitats on LANL property. The HMP provides guidance for what, when, and where different types of activities are allowed without further review by the US Fish and Wildlife Service (USFWS). If HMP requirements cannot be followed by a project, then a BA must be prepared. Pursuant to Section 7 of the Endangered Species Act (ESA), 16 U.S.C. § 1536(a)(2), a BA is used to determine and document whether a proposed activity is likely to adversely affect listed species, proposed species, or designated critical habitat. BAs account for the direct, indirect, and cumulative effects on threatened and endangered species from construction and operation of projects at LANL that cannot operate within the HMP guidelines.

Mitigations:

1. Develop and implement a wetlands/floodplains management plan to address protection of wetlands, riparian areas, and springs.
2. Evaluate watershed-specific ecological risk assessments for threatened and endangered (T&E) species and update outdated site-wide modeling for species.
3. Consider span bridges instead of land bridges in areas that cross canyons in T&E species habitats to reduce environmental impacts (land bridge proposals will require USFWS consultation under the ESA).
4. Implement all reasonable and prudent measures in the BA through the institutional project review process (PRID) and implementation of the T&E species HMP.

Actions Taken:

LANS completed the Riparian Inventory in 2012. Watershed-specific ecological risk assessments for T&E species have been integrated into the Decision Support Analysis (DSA) tool. Two biological assessments and one request to amend a biological opinion were transmitted to the Field Office in FY 2013 for transmittal to the USFWS:

- *Biological Assessment of the Effects of Implementing the Jemez Mountains Salamander Site Plan on Federally Listed Threatened and Endangered Species at Los Alamos National Laboratory* (LA-UR-13-25060) (LANL 2013b)

- *Biological Assessment of the Effects of the Recreational Use of Los Alamos Canyon on Federally Listed Threatened and Endangered Species at Los Alamos National Laboratory* (LA-UR-13-25181) (LANL 2013c)
- *Request to Amend the Biological Opinion on the Effects to the Mexican Spotted Owl from the Conveyance and Transfer of Seven Land Tracts at Los Alamos National Laboratory* (LA-UR-13-26945) (LANL 2013d)

Effectiveness of the Mitigations:

Mitigations 1 and 2 are complete. Mitigation 3, as written, does not provide for a measured response of its effectiveness. Mitigation 4 is effective on a project-by-project basis but is subject to interpretation.

Recommendation:

It is recommended that Mitigations 1 and 2 be closed. It is further recommended that Mitigations 3 and 4 be rewritten to allow for measuring the effectiveness of the mitigations.

2.12 Biological Resources Management Plan

NEPA Driver:

The commitment to create and maintain a Biological Resources Management Plan (BRMP) is derived from the 2008 SWEIS ROD. The *Biological Resources Management Plan for Los Alamos National Laboratory* (LANL 2007) outlines LANS's commitment to conduct site operations using processes that minimize risks to mission implementation and biological resources. The BRMP is implemented annually.

Mitigation:

1. Implement the BRMP.

   (The BRMP addresses LANS's commitment to conduct site operations using processes that minimize risk to both mission implementation and biological resources. The BRMP describes objectives, strategies, and actions that fulfill the following goals: 1. Mission Support: Ensure and facilitate compliance with biological resource laws and regulations 2. Site Stewardship: Identify and mitigate adverse impacts on biological resources 3. Regional Commitment: Meet responsibilities as a good neighbor and trustee of natural resources.)

Actions Taken:

The annual Mexican Spotted Owl surveys at LANL began in March 2013 and were completed by April. Annual Southwestern Willow Flycatcher surveys began in May 2013 and were completed in July 2013, there were no flycatchers detected this year.

Annual avian monitoring was completed at two firing sites and one open burn site at LANL, the results will be published in the first quarter FY 2014. A DOE complex-wide lessons learned was published regarding the threats to migratory birds from open bollards and pipes, which was first documented by LANS biologists.

LANS biologists supported Bandelier National Monument with a Jemez Mountains salamander survey and relocation effort, and two Jemez Mountains salamander surveys were completed at TA-57 Fenton Hill with no salamanders being detected. LANS biologists also completed a two-day survey protocol training for the newly listed Jemez Mountains salamander in July 2013. In addition, LANS staff placed remote detection cameras in the White Rock Canyon Reserve during the first quarter FY 2013 to document wildlife and feral cattle use of the Reserve.

The following reports were prepared and submitted in FY 2013:

- *Winter and Breeding Bird Surveys at Los Alamos National Laboratory Progress Report for 2010 to 2012* (LA-UR-12-25120) (LANL 2013e)
- *Los Alamos National Laboratory Fall Avian Migration Monitoring Report 2010-12* (LA-UR-13-20413) (LANL 2013f)
- *Feral Cattle in the White Rock Canyon Reserve at Los Alamos National Laboratory* (LA-UR-13-21102). (LANL 2013g)

Effectiveness of the Mitigation:

Mitigation 1 is effective as a result of implementation of the BRMP and use of the PRID.

Recommendation:

It is recommended that Mitigation 1 be modified to reflect the annual goals of the BRMP.

2.13 Cultural Resources Management Plan

NEPA Driver:

The commitment to create and maintain a CRMP is derived from the 2008 ROD for the 2008 SWEIS. The existing CRMP (LANL 2006b) was revised by LANS and submitted to the New Mexico State Historic Preservation Officer (SHPO) in May 2012 and resubmitted in July 2013 for review.

Mitigation:

1. Implement CRMP.

   (The CRMP defines the responsibilities, requirements, and methods of managing cultural resources on LANL property. It provides an overview of the cultural resources program, establishes a set of procedures for effective compliance with

historic preservation laws, addresses land-use constraints and flexibility, and makes the public aware of the stewardship responsibilities and steps being taken by the Field Office for managing the cultural heritage at LANL.)

Actions Taken:

In FY 2013, LANS cultural resource managers continued to support ongoing projects, including final field work assessments for the Cerro Grande Fire SEA MAP (DOE 2000a), public use of recreational trails in TAs-70 and -71, wildland fire fuels mitigations, archaeological site fencing at Minie Firing Site, impacts to cultural resources due to flooding, REDINet, TA-72 Firing Range upgrades, the Bradbury Science Museum's 70th Anniversary Lecture Series, drainage remediation at TA-16 south of Water Canyon, Mortandad Well Pump Test project, and support for a computer virtualization project for Nake'muu. Tours were also conducted for the Field Office of the archaeological sites Tsirege and Sandia Cave Complex.

Historic building program work during FY 2013 included conducting archival photography of buildings in TAs-8, -9, -11, -14, -15, -16, -22, -36, -39, and -40 in support of the LANL-wide fall protection installation project.

Progress was made on the long-term surveillance and maintenance for historic buildings on the LANL preservation list, specifically the development of historic building signage for the 34 key buildings listed in the CRMP.

Effectiveness of the Mitigation:

Mitigation is effective when PRID is used.

Recommendations:

It is recommended that this mitigation be modified to reflect the annual goals of the CRMP.

2.14 Energy Conservation: Electrical

NEPA Driver:

These mitigations are derived from the 2008 ROD for the 2008 SWEIS and LANL's Site Sustainability Plan (SSP) (LANL 2012a).

Mitigations:

1. Upgrade electrical infrastructure in buildings to reduce electrical usage.
2. Install one gas-fired combustion turbine generator to support peak demand and upgrade existing steam turbines.

3. Meter major energy user facilities with high-end "Square-D" meters (as required), and sub-meter, when necessary, all other facilities to quantify and evaluate electrical consumption.
4. Construct the power line from the Norton substation to the Southern Technical Area (STA) substation.
5. Construct Pajarito Corridor Electric Substation at TA-50 to serve all new projects along the Pajarito Corridor, including TA-55, CMRR, Nuclear Materials Safeguards and Security Upgrades Project, and RLWTF.
6. Implement Energy Savings Performance Contract third-party financed retrofit projects to improve building efficiencies LANL-wide with individual satellite boilers to supply steam to TA-03 buildings, including the Health Research Laboratory at TA-43.
7. Purchase additional renewable energy and/or renewable energy credits.
8. Purchase and/or lease *Energy Star* electronics.
9. Improve new building efficiencies by integrating Leadership in Energy and Environmental Design/High Performance Sustainable Building design for new construction.

Actions Taken:

LANS submitted the FY 2013 SSP to the Field Office and DOE/NNSA in November 2012. Through planned investments, LANS reduced its energy intensity measure by three percent and continued to reduce energy in its facilities by investing $1.8 million to upgrade building automation systems in large exhaust facilities to enable night setbacks, repair heating, ventilation and air conditioning (HVAC) systems, and conduct steam trap surveys and repair. LANS worked to complete milestones within the FY 2013 SSP and Program Implementation Plan. In order to meet the DOE sustainability goals, LANS pursued a combination of additional investments in renewable energy, green construction practices, and operational improvements for energy efficiency.

Some specific examples of improvements for energy efficiency include the following:

- Installed Light Emitting Diode (LED) lighting upgrades at TA16-302, TA-03-1410, TA-03-30, TA-60-01, TA-03-261, and parking lot LED lighting upgrades between the Laboratory Data Communication Center and Transit station plus a photocell for reduced lighting.
- Purchased solar lighting for TA-54 night work.
- Installed Rolls-Royce Combustion Gas Turbine Generator in 2009.
- Put together Data Center Evaluation Team and identified and evaluated the extent of metering required within Data Centers.

- Updated Metering server Square D Powerlogic software.
- Completed High Performance Sustainable Buildings Guiding Principle implementation in TAs-60-175, -63-0033, -63-111, and -03-1411.
- Completed 21 extended industry standard architecture audits (25 percent of covered facilities) to identify energy conservation measures.
- Upgraded to Configuration Manager 2012 on eligible computers to reduce energy.
- Completed High Performance Sustainable Buildings Guiding Principle implementation in TAs-60-175, -63-0033, -63-111, and -03-1411.
- Recommissioned eight facilities (to date, more facilities to follow) to include Building Automation Systems through the High Performance Sustainable Buildings Program.
- LANL Engineering Standards now require Leadership in Energy and Environmental Design (LEED) for new construction.

Effectiveness of the Mitigations:

Mitigations 1, 2, 6, 7, 8, and 9 are complete. Mitigation 3 is effective through the implementation of the FY 2013 SSP. Mitigations 4 and 5 are on hold due to funding constraints.

Recommendation:

It is recommended that LANS continue to implement the SSP and the Long-Term Strategy for Environmental Stewardship and Sustainability (LTSESS) (LANL 2012b) and that Mitigations 1, 2, 6, 7, 8, and 9 be closed.

2.15 Energy Conservation: Natural Gas

NEPA Driver:

These mitigations stem from the 2008 ROD for the LANL 2008 SWEIS and the *Environmental Assessment for the Installation and Operation of Combustion Turbine Generators at Los Alamos National Laboratory, Los Alamos, New Mexico* and associated FONSI, DOE/EA-1430, LA-UR-02-6482 (DOE 2002b).

Mitigations:

1. Meter major energy user facilities with high-end "Square-D" meters (as required), and sub-meter other facilities when appropriate to quantify and evaluate natural gas consumption to enable future conservation efforts.

2. Install more efficient gas-fired combustion turbine generators and upgrade existing steam turbines to conserve power and energy.

Actions Taken:

LANS finished installing natural gas meters within the candidate High Performance Sustainable Buildings (HPSB) and is working on a design for additional gas meters in high exhaust facilities. To date, 22 building meters, 1 Combustion Gas Turbine Generator meter, 1 steam/power plant (2 meters), 8 satellite steam plants, and 10 LAC interchange meters have been installed for a total of 42 metered gas-consuming facilities. LANS also completed HPSB Guiding Principle implementation in buildings 60-175, 63-0033, 63-111, and 03-1411.

Effectiveness of the Mitigations:

Both mitigations are complete.

Recommendation:

It is recommended that both mitigations be closed through the Field Office. Any further actions associated with these mitigations will be completed under the SSP and the LTSESS.

2.16 Energy Conservation: Water

NEPA Driver:

These mitigations are specified in the 2008 ROD for the 2008 SWEIS.

Mitigations:

1. Expand the SERF and take advantage of additional opportunities to increase the amount of recycled water usage and reduce water consumption at LANL.
2. Promote water conservation projects and plans that contribute to compliance with DOE Order 430.2B.

Actions Taken:

LANS has implemented and/or completed several projects designed to enhance water conservation, including the initiative to identify and fix water leaks, four Town Hall meetings on energy and water conservation, and the expansion of the SERF to recycle effluent water. With the completion of the SERF-E in August 2012, LANS was able to reuse 20 million gallons of water. LANS has also issued a Request for Proposal for a subcontractor to establish a control system and use silica-inhibiting chemicals within the cooling towers to increase cycles of concentration in order to decrease water consumption used for cooling. LANS placed a water meter on Anchor Ranch Road to measure the amount of undetectable leaks within the water utility system. LANS utility

system engineers estimate the leaks could account for up to 23 percent of water use due to leaks at the lead and oakum joints in the 1950s and 60s vintage piping system; 25 percent of the LANL system is comprised of this style of pipe. LANS is also investing in additional site water meters in order to identify potential water leaks and conservation opportunities. To date, design is complete, and construction has started for five site-level water meters.

Effectiveness of the Mitigations:

Both of these mitigations are complete.

Recommendation:

It is recommended that both of these mitigations be closed. Any further actions associated with these mitigations will be completed under the SSP and the LTSESS.

2.17 Pollution Prevention

NEPA Driver:

The mitigations for pollution prevention are derived from DOE O 450.1, *Environmental Protection Program* (canceled by DOE O 436.1, *Departmental Sustainability [DOE 2011]*) and Module VIII, Section B.1, of LANL's Hazardous Waste Facility Permit (NM0890010515-1).

Mitigations:

1. Annually report waste reduction performance against Environmental Management System (EMS) waste reduction goals.
2. Continue to integrate waste reduction activities into LANL's EMS.

Actions Taken:

LANS submitted the annual Pollution Prevention Tracking and Report System data and the Annual Hazardous Waste Minimization report to the New Mexico Environment Department (NMED) during the first quarter of FY 2013.

The annual call for Pollution Prevention (P2) Awards for FY 2012 LANL project nominations was issued and LANS personnel received 41 nominations. Reviews were conducted and award levels were selected. The annual LANL P2 Award ceremony was held in April. Twelve projects were submitted for consideration in the NNSA/DOE P2 Award cycle.

LANS awarded 13 P2 Projects for FY 2013. An improved P2 Award nomination process/form to capture data related to award criteria was developed and implemented. LANS P2 staff conducted mid-year reviews of all projects to identify scope, schedule, and funding issues requiring action.

LANS P2 staff conducted a site visit of the Y-12 facility at Oak Ridge National Laboratory to baseline their efforts in P2 (The PrYde Program and implementation of 5s protocol) and began developing a proposed framework for similar efforts at LANL.

LANS P2 staff provided support to organizational EMS teams to review end-of-year reports and close-out of FY 2012 action plans and also conducted reviews of draft FY 2013 action plans. The internal EMS database was updated to provide for tracking of actions related to SSP goals, P2 Projects, SWEIS actions, LTSESS, and Safety Improvement initiatives. LANS successfully completed external third-party surveillance audit (ISO 14001:2004) of the EMS. The results included *"no change to LANL certificate of registration,"* with zero minor non-conformities, and four opportunities for improvement. There were also six system strengths identified. LANS commenced efforts to compile and integrate LANL objectives, targets, and goals from numerous sources to eliminate confusion and reduce complexity associated with setting FY 2014 EMS Objectives and Targets.

Effectiveness of the Mitigations:

Both of these mitigations are complete. The P2 and EMS programs are now well established, stand-alone programs with adequate funding.

Recommendation:

It is recommended that both of these mitigations be closed through the Field Office. Any further actions associated with these mitigations will be completed under the SSP and the LTSESS.

2.18 Clean Fill

NEPA Driver:

These mitigations are specified in the 2008 ROD for the 2008 SWEIS.

Mitigations:

1. Use excavation and demolition spoils locally to minimize purchase or new excavations of clean fill when feasible.
2. Report annually on reuse of clean fill materials from excavations and DD&D.

Actions Taken:

The clean fill website allows projects to acquire clean fill through a centralized web application. To date, 20,345 cubic yards of clean fill has been made available, and 16,487 cubic yards of clean fill have been requested for use on site.

The clean fill yard is managed by Utilities and Institutional Facilities (UI-DO) and the Clean Fill Management database is managed by ENV-ES and has been incorporated

into LANL's PRID system. Reuse of clean fill helps limit greenhouse gas emissions and helps LANS to meet its sustainability goals. Data are reported annually to DOE.

Effectiveness of the Mitigation:

Both of these mitigations are complete.

Recommendation:

It is recommended that both of these mitigations be closed through the Field Office. Any further actions associated with these mitigations will be completed through the SSP and the LTSESS.

2.19 Traffic

NEPA Driver:

These mitigations stem from the 2008 SWEIS MAP, the 2008 ROD for the 2008 SWEIS, and from DOE Order 430.2B, *Departmental Energy, Renewable Energy and Transportation Management* (DOE 2008d) (canceled by DOE O 436.1, *Departmental Sustainability [DOE 2011]*).

Mitigations:

1. Identify possible solutions (e.g., schedule activity for off-peak hours, reroute truck traffic, construct alternative roads, use multiple shifts, and use alternative entries and exits) to minimize traffic issues for Royal Crest Mobile Home Park and the Los Alamos town center related to DD&D, remediation, and site closure projects.
2. Encourage alternative transportation, including walking, carpooling, bicycling, and public transportation.
3. Consider plans for an alternative route off Delta Prime (DP) Mesa.

Actions Taken:

An Interagency Team composed of DOE/NNSA, LANS, New Mexico Department of Transportation (NMDOT), Federal Highway Administration (FHWA), and NPS (Bandelier National Monument) representatives met to discuss staged efforts to improve traffic safety and visitor parking near the intersection of NM State Road 4 and East Jemez Road (Truck Route). This location is sited on DOE lands adjacent to Bandelier and is maintained by NMDOT. NPS desires to construct safe access into the parking area and has an FHWA engineer working on a design. All parties agree that the design must comply with current road standards and that all permits and permissions need to be obtained.

A study team has been assembled to investigate options to enhance the security envelope by separating LANL traffic from public traffic. Options being studied by an

independent architect/engineer include construction of a bypass to the north of the Research Park (previously designed by LAC), and the construction of a divided road section through TA-03.

Design standards have been developed for the LANL Trail System. The standards were developed in cooperation with LANL Trails Working Group, LAC, NPS Bandelier, and the Santa Fe National Forest. The trail standards, along with trail mapping and difficulty ratings, will be used to promote health, fitness, and an alternate mode of transportation both on-site and off-site.

A Transportation Master Plan has been initiated to better define the roadway network, and interfaces with mass transit (Park & Ride, Atomic City Transit, and Northern New Mexico Regional Transit), bike networks, and sidewalks/trails. The master plan will be used for future improvement planning and design standards. A Roads, Parking Lots, and Sidewalks blog has also been created and is available through the LANL homepage.

Condition assessments of roads, sidewalks, and parking lots have been completed. Condition assessments for guardrails, culverts, traffic signals, and traffic signs are being organized. The condition assessments are being used to prioritize allocation of maintenance funding to maximize benefits to the overall transportation system.

The annual Los Alamos Canyon Bridge inspection was completed in June. The inspection itemizes findings, which are the basis for annual maintenance. The final report will be available in the next quarter. Bridge inspection was issued in August. Findings were identified and added to annual maintenance projects list.

The Transuranic Waste Facility (TWF) is completing a design to place a Metalith barrier on the frontage of Pajarito Road and Puye Road. Design reviews are underway to ensure that the traffic impact is minimized and traffic safety is a top priority. Gamma Ray Road was redesigned to include a pedestrian walkway and bike lane from Pajarito Road to TA-48.

Effectiveness of the Mitigations:

Mitigations 1 and 3 are complete. Mitigation 2 is ongoing but is subject to interpretation and not measureable.

Recommendation:

It is recommended that Mitigations 1 and 3 be closed through the Field Office. It is further recommended that Mitigation 2 either be revised to make it specific and measureable or that it be closed through the Field Office.

2.20 Integrated Land Management Planning

NEPA Driver:

The Integrated Land Management Planning (ILMP) mitigations are derived from the 2008 SWEIS MAP and the 2008 ROD for the 2008 SWEIS.

Mitigations:

1. Enhance the decision support tool to offer an objective and semi-quantitative method for integrating opportunities and constraints for project planning and compliance.
2. Use PRID System in concert with the decision support tool and project site selection process to better identify potential site planning constraints early in project development.
3. Use the decision support tool to comply with Land Transfer Regulations (10 CFR 770).

Actions Taken:

The ILMP project is complete, and DSA training is performed on an as-needed basis. Land planning is fully integrated with the PRID and DSA tools.

Effectiveness of the Mitigations:

Mitigations 1 and 3 are complete. Mitigation 2 is effective but could be more specific and measureable.

Recommendation:

It is recommended that Mitigations 1 and 3 be closed through the Field Office. Mitigation 2 is ongoing and should be revised to make it more specific and measureable.

2.21 Compliance Assurance

NEPA Driver:

2008 SWEIS MAP and 2008 ROD for the 2008 SWEIS.

Mitigations:

1. Implement compliance assurance process on a sample of PRID projects.
2. Develop metrics and track results.
3. Formally assign a functional manager for the PRID process and support tool and ensure supporting authority and funding for effective use in project development, compliance, and site planning.

4. Implement process improvement measures as appropriate.

Actions Taken:

The Compliance Assurance subtask identified process improvements for LANL's PRID system, which are being implemented. The IER Program is the primary LANL customer interface for environmental issues and integrates the EXID process with the PRID. All new and modified activities and projects are subject to environmental reviews using the EXID and PRID system. In FY 2013, more than 500 EXIDs and more than 130 PRIDs were submitted and reviewed.

Two reports were issued:

- *Compliance Assurance Subtask Pilot Project Final Report—FY 2009* (LA-UR-09-06307) (LANL 2009)
- *Compliance Assurance Subtask Pilot Project Final Report—FY 2010* (LA-UR-10-07064) (LANL 2010)

Effectiveness of the Mitigations:

Mitigations 1 through 3 are complete. Mitigation 4 is effective with integration of the DSA and the PRID ongoing.

Recommendation:

It is recommended that Mitigations 1 through 3 be closed through the Field Office. Completion of the integration of the DSA with the PRID is anticipated in FY 2014.

2.22 Commitments to Santa Clara Pueblo

NEPA Driver:

The commitments to Santa Clara Pueblo are derived from the 2008 SWEIS MAP and the 2008 ROD for the LANL SWEIS.

Mitigation:

1. No later than January 30, 2009, DOE/NNSA Los Alamos Site Office (LASO) shall develop jointly with Santa Clara Pueblo a plan to address environmental justice and human health concerns and issues identified by the Santa Clara Pueblo during the SWEIS process. The plan will include specific tasks and timelines, and identify the necessary NNSA and Pueblo resources to help ensure implementation of the plan. In consultation with Santa Clara Pueblo, NNSA LASO will update the MAP to incorporate these actions.

Actions Taken:

The Field Office continues consultations with Santa Clara Pueblo to develop a mutually acceptable plan to address specific environmental justice and human health concerns and issues identified by Santa Clara Pueblo during the SWEIS process. NNSA provided Santa Clara Pueblo financial and technical assistance during the last quarter of FY 2010 to commence work on this type of plan, which would include specific tasks with timelines, and identify resources to implement this plan. Santa Clara Pueblo advised the Field Office of data acquisition problems during FY 2011, and LASO conducted meetings to try to address them. A draft plan on environmental justice and human health concerns and issues was submitted to NNSA for review and comment during the first quarter of FY 2013. The Governor of the Pueblo, on behalf of the Tribal Council, agreed to proceed with comment reconciliation and finalization of the plan during the third quarter. Once the Field Office's comments are reconciled, this plan would be submitted to the Tribal Council for approval.

Effectiveness of the Mitigation:

The mitigation is effective.

Recommendation:

The Field Office continues to provide support to Santa Clara Pueblo to develop a draft plan for Tribal Council review.

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Appendix I

2008 Site-Wide Environmental Impact Statement

FY 2013 Mitigation Action Plan Annual Report

Tracking Log

Acronym List

ADE	Associate Director for Engineering and Engineering Sciences
ADEP	Associate Directorate for Environmental Programs
ADESH	Associate Director for Environment, Safety, and Health
ADNHHO	Associate Director for Nuclear and High-Hazard Operations
ADPM	Associate Directorate for Project Management
ALARA	as low as reasonably achievable
ASM	Acquisition Services Management Division
BA	Biological Assessment
BMPs	Best Management Practices
BRMP	Biological Resources Management Plan
CAA	Clean Air Act
CAP	Corrective Actions Program
CFR	Code of Federal Regulations
CGTG	Combustion Gas Turbine Generator
CMRR	Chemistry and Metallurgy Research Replacement
CRMP	Cultural Resources Management Plan
DD&D	decontamination, decommissioning and demolition
DOE	Department of Energy
DPR	designated procurement representative
EA	Environmental Assessment
EAP	environmental action plan
EISA	extended industry standard architecture
EM	Emergency Management
EMS	Environmental Management System
ENV	Environmental Protection Division
ENV-ES	Environmental Stewardship Group
EO	Emergency Operations Division
EO-EM	Emergency Management Group
EP	Environmental Programs
EPA	Environmental Protection Agency
ER	Environmental Report
ESA	Endangered Species Act
EXID	Excavation Permit
FOD	Facility Operations Division
FONSI	Finding of No Significant Impact
FRS	Flood Retention Structure
FY	Fiscal Year
HMP	Habitat Management Plan
HPSB	High Performance Sustainable Buildings
HSR	Health Safety Radiation Protection
IFCS	Institutional Facilities and Central Services
ILMP	Integrated Land Management Plan

IP	Infrastructure Planning
IPA	Integrated Project Application
LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security, LLC
LANSCE	Los Alamos Neutron Science Center
LASO	Los Alamos Site Office
LDCC	Laboratory Data Communications Center
LEED	Leadership in Energy and Environmental Design
LTSESS	Long-Term Strategy for Environmental Stewardship and Sustainability
MAP	Mitigation Action Plan
MAPAR	Mitigation Action Plan Annual Report
MDA	Material Disposal Area
MSS	Maintenance and Site Services Division
N	Nuclear Nonproliferation Division
N/A	not applicable
NEN-3	Nuclear Engineering and Nonproliferation-International Threat Reduction Group
NEPA	National Environmental Policy Act of 1969
NNSA	National Nuclear Security Administration
OI-PO	Operations and Infrastructure Program Office
OSRP	Off-Site Source Recovery Project
P2	Pollution Prevention
PIP	performance improvement plan
PPTRS	Pollution Prevention Tracking and Report System
PRID	Permits and Requirements Identification
PRS	potential release site
RLUOB	Radiological Laboratory Utility Office Building
RLWTF	Radioactive Liquid Waste Treatment Facility
SEA	Special Environmental Analysis
SERF	Sanitary Effluent Reclamation Facility
SSP	Site Sustainability Plan
SWEIS	Site-Wide Environmental Impact Statement
T&E	threatened and endangered
TA	Technical Area
TRU	transuranic
UI	Utilities and Institutional Facilities Division Office
USFWS	United States Fish and Wildlife Service
WAGES	water, air, gas, electric, and steam
WFMP	Wildland Fire Management Plan
WIPP	Waste Isolation Pilot Plant
WX	Weapons Experiments

Table 1. 2008 SWEIS MAPAR Tracking Log FY 2013 (Green items are complete; yellow is an on-going action; red is a closed or on-hold mitigation).

Topic	Mitigation Action Commitment	NEPA Driver	Actions Taken	Effectiveness of Mitigation	Recommendation	Responsible Party
Transition of Previous LANL NEPA Mitigation Commitments into the 2008 SWEIS MAP						
3.1 DARHT MAP	DOE will periodically (at least once a year) arrange for Tribal Officials to visit cultural resource sites within TA-15 that are of particular interest to the tribes.	MAP for DARHT EIS (DOE/ EIS-0228; Oct. 1996)	Maintenance visit completed May & June 2013. Tours are conducted as requested by the tribes. Maintenance visits are conducted as needed.	Mitigation is effective. San Ildefonso Pueblo is invited to tour Nake'muu annually.	Continue to conduct tours as requested and maintenance visits as necessary.	ENV-ES Field Office – Cultural Resources Program Manager and Intergovern-mental Programs (Tribal Affairs)
	Reduce annual surveillance sampling schedule to soils and one additional medium.		Annual surveillance sampling was reduced in 2009.	Mitigation Complete (2009)	Close out mitigation through the Field Office. Annual sampling will continue by ENV-ES.	ENV-ES
	Emissions data from contained experiments and comparisons with results from previous operations, starting in 2001, will be included in the 2009 SWEIS MAPAR.		Mitigation completed in 2010. Included in 2009 SWEIS MAPAR.	Mitigation Complete (2010) LA-UR-09-06935	Close out mitigation through the Field Office.	N/A
3.2 Trails MAP	Complete eligibility evaluations for historic trails under the National Historic Preservation Act and identify additional environmental issues on trails use.	DOE/EA-1431 (Aug. 2003) and FONSI (Sept. 2003)	An assessment was performed on an archaic lithic scatter (LA 139481) in TA-71 due to impacts from trail users.	Mitigation is effective. Cultural sites are assessed on an as-needed basis.	Recommend completion of Trails Management Plan for TAs-70/-71 to develop a strategy for these evaluations.	ENV-ES Field Office – Cultural Resources Program Manager
	Evaluate and manage trails to determine appropriate closures and/or restrictions.		Maintenance occurs on an as needed basis. The Lower Water Canyon trail was evaluated for flood damage after the flood event of 9/13/13. No significant damage found. The Anniversary Trail was inspected for unauthorized drilling activity. Los Alamos County responsible and was directed to work through the	Mitigation is effective.	Prepare work plan for FY 2014 to include trails maintenance.	ENV-ES Field Office – Landlord Program Manager

Topic	Mitigation Action Commitment	NEPA Driver	Actions Taken	Effectiveness of Mitigation	Recommendation	Responsible Party
			Field Office and submit PRID and EXID tools. Trails Working Group meetings were held in July, August, and September. New fencing and trailhead kiosks were installed at 12 trailheads in TAs-70/-71. Fencing and gates were installed along the DOE property line south of lots on Monte Ray South in Pajarito Acres. Trails are patrolled by Bandelier National Monument Rangers.			
	Prepare management plans for trails in TAs-70 and -71.		This mitigation has been integrated into revised CRMP.	This work will continue under the new CRMP once it is finalized.	Close out mitigation through the Field Office. Work will continue under the CRMP.	ENV-ES Field Office – Cultural Resources Program Manager and Landlord Program Manager
	Support the use of volunteers for selected trails maintenance projects at LANL.		New Institutional Agreement re: volunteer trails work established in June 2012. Maintenance of trails occurs on an as needed basis.	Mitigation is effective.	Prepare work plan for FY 2014 to include trails maintenance.	ENV-ES
3.3 SEA MAP	Monitor biota and sediment contamination behind the Los Alamos Canyon Weir and the Pajarito Canyon FRS and report results in the ESR.	DOE/SEA-03 (Sept. 2000)	Samples of small mammals and vegetation for radionuclide, heavy metals, and PCBs were collected from the Los Alamos Canyon Weir and from the Pajarito Canyon Flood Retention Structure and submitted for analysis. Results have been received.	Mitigation is effective.	Continue sampling annually.	ENV-ES Field Office – EM

Topic	Mitigation Action Commitment	NEPA Driver	Actions Taken	Effectiveness of Mitigation	Recommendation	Responsible Party
	Periodically remove sediment from the Los Alamos Canyon Weir based on sedimentation rate and contamination accumulation rate.		Cleanouts of the Los Alamos Canyon weir are performed periodically to stabilize potentially contaminated sediments. Cleanouts occurred in 2001 (3000 cubic yards removed and placed on the side slopes), 2009 (1500 cubic yards removed and taken to Area G), 2012 (2000 cubic yards removed following the Las Conchas fire, sediment placed on site and stabilized), and 2013 (6000 cubic yards removed and sediment placed on site and stabilized).	Mitigation is effective.	Continue as needed. Additional cleanout will be required in FY 2014 due to flooding that occurred in Sept. 2013.	EP-CAP Field Office – EM
	Complete rehabilitation of cultural resources impacted by the Cerro Grande Fire		Rehabilitation was completed in 2012. Erosion controls, fencing, and vegetation removal.	Mitigation Complete	Close out mitigation through the Field Office.	Field Office – Cultural Resources Program Manager
3.4 FRS EA	Annually monitor the FRS for structural integrity and safe operations until removed.	DOE/EA-1408 (Aug. 2002)	The FRS is inspected annually. Last inspection was conducted in May 2013. (Copy of inspection report available upon request.)	Mitigation is effective. "Observation from this inspection noted only minor changes from the inspection performed on June 7, 2012. The structure does not have any obvious, significant structural deterioration and appears to be in good condition considering the construction method used and expected structure longevity. No corrective actions are recommended at this time."	Continue annual inspections of the FRS.	UI-DO

Topic	Mitigation Action Commitment	NEPA Driver	Actions Taken	Effectiveness of Mitigation	Recommendation	Responsible Party
	Remove portions of the FRS in accordance with DOE/EA-1408.		N/A	**Mitigation On Hold** It is anticipated that the material generated by the FRS removal would be used to cover Area G when capped. Thus activities are on hold until Area G is ready for capping.	N/A	ADNHHO ENV Division
	Recycle demolition spoils from FRS DD&D as appropriate.					
	Consider leaving an aboveground portion of the FRS equivalent to the dimensions of a low-head weir to retain potentially contaminated sediments on Laboratory land.					
	Remove aboveground portions of the steel diversion wall below the FRS.					
	Re-contour and reseed disturbed areas to protect surface water quality in Pajarito Canyon after the FRS is removed.		Will be reseeded when structure is removed.	**Mitigation On Hold** This mitigation is on hold until the FRS is removed.	Area will be re-contoured and reseeded once removal of the FRS is complete.	ADNHHO
Project-Specific Mitigation Measures Analyzed in the SWEIS						
3.5 RLWTF/ Outfall Reduction	All further actions affecting water flow volumes in Mortandad and Sandia canyons will be assessed for positive and negative impacts.	BA for the 2008 SWEIS (LA-UR-06-0679; 2006) 2009 ROD for the LANL SWEIS (July 2009)	SERF EA and FONSI issued in 2010. SERF Expansion completed in 2012. The Draft ground water permit is currently out for public comment. No water was discharged to Mortandad Canyon in FY 2013. Information on discharges to Sandia Canyon is not available until Oct. 10. Will be reported in FY 2014 MAPAR.	Mitigation is effective.	Ensure PRIDs/EXIDs are used for projects potentially impacting canyons.	ENV Division ADEP Field Office – EM

Topic	Mitigation Action Commitment	NEPA Driver	Actions Taken	Effectiveness of Mitigation	Recommendation	Responsible Party
3.6 OSRP Project	Institute adequate controls on the quantities and methods of storing sealed sources containing cobalt-60, iridium-192, or cesium-137 to mitigate the effects of potential accidents.	2008 ROD for the LANL SWEIS (Sept. 2008)	N/A	**Mitigation On Hold** The laboratory currently does not accept sealed sources containing cobalt-60, iridium-192, or cesium-137.	N/A	NEN-3
3.7 SERF Expansion	Implement the SERF MAP	MAP and FONSI for DOE/EA-1736 (Aug. 2010) 2008 ROD for the LANL SWEIS (Sept. 2008)	SERF Expansion is complete. Mitigations associated with SERF expansion are complete. Mitigations associated with the S-2 reach are ongoing.	Mitigation is effective.	Continue to implement mitigations associated with the S-2 reach.	ADEP
Institutional Resource Management Responsibilities						
3.8 Air Emissions	Continue air monitoring program to comply with the CAA, including monitoring radiological air emissions. Monitor and track LANSCE emissions to maintain the annual dose to the public under the administrative limit.	LANL Clean Air Act Title V (42 U.S.C § 7661 et seq.) site-wide permit No: P100-R1-M1 (June 2012); MAP for the 2008 SWEIS (Dec. 2008)	Implement or comply with Title V site-wide permit No: P100-R1-M1 as required by the CAA.	LANL complies with the CAA and operates under Title V site-wide permit No: P100-R1-M1.	Close out mitigation through the Field Office. CAA compliance will continue via the LANL Air Quality program.	ENV-ES
	Use existing PRID program and other tools to assess potential air quality impacts from new or modified projects and provide BMPs to control emissions (e.g., maintaining construction equipment and routine watering or eco-friendly chemical stabilization to control fugitive dust).		Implement or comply with Title V site-wide permit No: P100-R1-M1 as required by the CAA.	LANL complies with CAA and operates under Title V site-wide permit No: P100-R1-M1.	Close out mitigation through the Field Office. CAA compliance will continue via the LANL Air Quality program.	ENV-ES

Topic	Mitigation Action Commitment	NEPA Driver	Actions Taken	Effectiveness of Mitigation	Recommendation	Responsible Party
	Removal of contamination from MDAs and other PRSs would be conducted in a manner that protects the environment, the public, and worker health and safety.		MDA B remediation complete 2012.	LANL complies with CAA and operates under Title V site-wide permit No: P100-R1-M1.	Close out mitigation through the Field Office. CAA compliance will continue via the LANL Air Quality program.	ENV-ES
	Removal of waste from some large MDAs may require the use of temporary containment structures to limit possible releases of contaminated material to the environment to levels within applicable standards and ALARA.		Implement or comply with Title V site-wide permit No: P100-R1-M1 as required by the CAA.	LANL complies with CAA and operates under Title V site-wide permit No: P100-R1-M1.	Close out mitigation through the Field Office. CAA compliance will continue via the LANL Air Quality program.	ENV-ES
3.9 Wild-land Fire Manage-ment Plan	Implement WFMP with adequately funded ongoing program. (Note: this plan is now called the Wildland Fire Operations Plan [WFOP])	DOE Wildfire Management Policy (Feb. 2004) 2001 Federal Wildland Fire Management Policy and Implementing Actions (Jan. 2001) MAP for the 2008 SWEIS (Dec. 2008)	Mastication, thinning, and mowing occurred in FY 2013. The FY 2013 WFOP was implemented on 10/1/12. (Plan available upon request.) All operational objectives were met on schedule.	Mitigation is effective. Annual ongoing requirement.	Continue implementing annual plans to mitigate wildfire risks.	EO-EM
	Continue to further reduce wildfire risks by shipping legacy TRU waste, currently stored in the TA-54 domes, to WIPP.		2745.6 cubic meters of TRU waste have been shipped to date as part of the 3706 Campaign.	Mitigation is effective. Removes aboveground waste that could contribute to human health impacts in the case of a wildfire.	Continue accelerated shipments to WIPP.	ADEP
3.10 Environ-mental Justice	Continue consultations and both formal and informal public meetings.	2008 ROD for the LANL SWEIS (Sept. 2008)	DOE/NNSA continued consultations and formal and informal public meetings regarding proposed projects at LANL.	Mitigation Complete	Close out mitigation through the Field Office. Consultations will continue via the NEPA process for individual projects.	ENV-ES Field Office – Intergovern-mental Programs

Topic	Mitigation Action Commitment	NEPA Driver	Actions Taken	Effectiveness of Mitigation	Recommendation	Responsible Party
	Improve upon and implement effective communications strategies to provide fair and equitable sharing of information about LANL operations to surrounding minority and low-income communities.		LANS continues to implement EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations through its Community Commitment Plan and associated programs, the LANS Regional Purchasing Plan, the LANS Small Business Plan, and the LANS Diversity Plan, as stipulated in the LANS Prime Contract.	Mitigation Complete	Close out mitigation through the Field Office. Consultations will continue via the NEPA process for individual projects.	ENV-ES Field Office – Intergovern-mental Programs
3.11 SWEIS Biological Assessment	Develop and implement a wetlands/floodplains management plan to address protection of wetlands, riparian areas, and springs.	BA for the 2008 SWEIS (LA-UR-06-0679; 2006)	Riparian Inventory completed in FY 2012.	Mitigation Complete	Close out mitigation through the Field Office.	Field Office – Biological Resources Program Manager
	Evaluate watershed-specific ecological risk assessments for T&E species and update outdated site-wide modeling for species.		Integrated into the DSA tool.	Mitigation Complete	Close out mitigation through the Field Office. Ecological risk will continue to be assessed via the DSA and PRID tools.	ENV-ES
	Consider span bridges instead of land bridges in areas that cross canyons in T&E species habitats to reduce environmental impacts (land bridge proposals will require USFWS consultation under the ESA).		Not the preferred alternative for any projects to date.	Mitigation not measurable. Consideration of span bridges could be assessed on a project-specific basis in the PRID tool.	Recommend modifying this mitigation to make it measurable.	ES Division
	Implement all reasonable and prudent measures in the BA through the institutional project review process and implementation of the T&E species HMP.		Two BAs and one request to amend a biological opinion were transmitted to the Field Office in FY 2013 for transmittal to the USFWS. These documents were: Biological Assessment of the Effects of Implementing the Jemez Mountains Salamander Site Plan	Mitigation measurable on a project by project basis.	Recommend modifying this mitigation to make it more specific and measurable.	ES Division

Topic	Mitigation Action Commitment	NEPA Driver	Actions Taken	Effectiveness of Mitigation	Recommendation	Responsible Party
			on Federally Listed Threatened and Endangered Species at Los Alamos National Laboratory (LAUR-13-25060); Biological Assessment of the Effects of the Recreational Use of Los Alamos Canyon on Federally Listed Threatened and Endangered Species at Los Alamos National Laboratory (LAUR-13-25181); Request to Amend the Biological Opinion on the Effects to the Mexican Spotted Owl from the Conveyance and Transfer of Seven Land Tracts at Los Alamos National Laboratory (LAUR-13-26945).			
3.12 BRMP	Implement BRMP. (The BRMP addresses LANL's commitment to conduct site operations using processes that minimize risk to both mission implementation and biological resources. The BRMP describes objectives, strategies, and actions that fulfill the following goals: 1. Mission Support: Ensure and facilitate compliance with biological resource laws and regulations 2. Site Stewardship: Identify and mitigate adverse impacts on biological resources 3. Regional Commitment: Meet responsibilities as a good neighbor and trustee of natural resources.)	DOE/EIS-0238 ROD (Sept. 1999) and DOE/EIS-0380 ROD (Sept. 2008)	The annual Southwestern Willow Flycatcher surveys were completed in FY 2013 and there were no flycatchers detected this year. A DOE complex-wide lessons learned was published regarding the threats to migratory birds from open bollards and pipes which was first documented by LANS biologists. Annual avian monitoring was completed in the FY 2013 at two firing sites and one open burn site at LANL and the results will be published in 1Q FY 2014.	Mitigation is effective as a result of implementation of the BRMP and use of project review process.	Recommend modifying this mitigation to make it measurable.	ENV-ES Field Office – Biological Resources Program Manager

Topic	Mitigation Action Commitment	NEPA Driver	Actions Taken	Effectiveness of Mitigation	Recommendation	Responsible Party
3.13 CRMP	Implement Cultural Resources Management Plan. (The Cultural Resources Management Plan defines the responsibilities, requirements, and methods of managing cultural resources on LANL property. It provides an overview of the cultural resources program, establishes a set of procedures for effective compliance with historic preservation laws, addresses land-use constraints and flexibility, and makes the public aware of the stewardship responsibilities and steps being taken by the Field Office for managing the cultural heritage at LANL.)	2008 ROD for the LANL SWEIS (Sept. 2008)	In FY 2013, cultural resource managers continued to support ongoing projects, including final field work assessments for the Cerro Grande Fire SEA MAP, public use of recreational trails in TAs-71 and -70, archaeological site fencing at Minie Firing Site, and support for a computer virtualization project for Nake'muu. Historic building program work during FY 2013 included, conducting archival photography of buildings in TAs-8, -9, -11, -14, -15, -16, -22, -36, -39, and -40 in support of the LANL-wide fall protection installation project. Progress was made on the draft National Historic Landmark District nomination for Manhattan Project properties and for long-term surveillance and maintenance for historic buildings on the LANL preservation list, specifically the development of historic building signage for the 34 key buildings listed in the LANL CRMP.	Mitigation is effective when project review process is followed.	Recommend modifying this mitigation to make it measurable.	ENV-ES Field Office – Cultural Resources Program Manager
3.14 Energy Conserv-ation: Electrical	Upgrade electrical infrastructure in buildings to reduce electrical usage.	2008 ROD for the LANL SWEIS (Sept. 2008) LANL Site Sustain-ability Plan (SSP) (Nov.2012)	Installed LED lighting upgrades at: TA-16-302, TA-03-1410, TA-03-30, TA-60-01, TA-03-261, and parking lot LED lighting upgrades between LDCC and Transit station plus a photocell for reduced lighting. Solar lighting purchased for TA-54 night work.	Mitigation is effective through implementation of LANL SSP.	Continue to implement SSP and close the mitigation through the Field Office.	UI-DO Field Office

Topic	Mitigation Action Commitment	NEPA Driver	Actions Taken	Effectiveness of Mitigation	Recommendation	Responsible Party
	Install one gas-fired combustion turbine generator to support peak demand and upgrade existing steam turbines.		Rolls-Royce Combustion Gas Turbine Generator was installed in 2009.	Mitigation Complete	Close out mitigation through the Field Office.	N/A
	Meter major energy user facilities with high-end "Square-D" meters (as required), and sub-meter, when necessary, all other facilities to quantify and evaluate electrical consumption.		Put together Data Center Evaluation Team and identified and evaluated the extent of metering required within Data Centers. Updated Metering server Square D Powerlogic software.	Mitigation is effective through implementation of LANL SSP.	Continue to implement SSP and the LTSESS and close this mitigation through the Field Office.	ADNHHO Field Office
	Construct the power line from the Norton substation to the STA substation.		N/A	**Mitigation On Hold due to lack of funding**	N/A	ADNHHO
	Construct Pajarito Corridor Electric Substation at TA-50 to serve all new projects along the Pajarito Corridor, including TA-55, CMRR, Nuclear Materials Safeguards and Security Upgrades Project, and RLWTF.		N/A	**Mitigation On Hold due to lack of funding**	N/A	ADNHHO
	Implement Energy Savings Performance Contract third-party financed retrofit projects to improve building efficiencies LANL-wide with individual satellite boilers to supply steam to TA-03 buildings, including the Health Research Laboratory at TA-43.		Completed High Performance Sustainable Buildings Guiding Principle implementation in 60-175, 63-0033, 63-111, 03-1411. Completed 21 EISA Audits (25% of covered facilities) to identify energy conservation measures. Upgraded to Configuration Manager 2012 on eligible computers to reduce energy.	Mitigation is Complete.	Continue to implement LANL SSP and the LTSESS and close this mitigation through the Field Office.	Institutional/ ADNNHO Field Office – SSP manager
	Purchase additional renewable energy and/or renewable energy credits.		N/A	Mitigation Complete	Continue to implement LANL SSP and the LTSESS and close this mitigation through the Field Office.	ADNNHO Field Office – SSP manager

Topic	Mitigation Action Commitment	NEPA Driver	Actions Taken	Effectiveness of Mitigation	Recommendation	Responsible Party
	Purchase and/or lease *Energy Star* electronics.		Industry standard	Mitigation Complete	Continue to implement LANL SSP and the LTSESS and close this mitigation through the Field Office.	ASM/ DPRs
	Improve new building efficiencies by integrating Leadership in Energy and Environmental Design/High Performance Sustainable Building design for new construction.		HPSB working groups; RLUOB LEED Gold certified Completed High Performance Sustainable Buildings Guiding Principle implementation in 60-175, 63-0033, 63-111, 03-1411.	Mitigation Complete	Continue to implement LANL SSP and the LTSESS and close this mitigation through the Field Office.	ES Division Field Office
3.15 Energy Conserv-ation: Natural Gas	Meter major energy user facilities with high-end "Square-D" meters (as required), and sub-meter other facilities when appropriate to quantify and evaluate natural gas consumption to enable future conservation efforts.	2008 ROD for the LANL SWEIS (July 2008) DOE/EA-1430 EA and FONSI (Dec. 2002)	To date, 22 building meters, 1 CGTG meter, 1 steam/power plant (2 meters), 8 satellite steam plants, and 10 LAC Interchange meters have been installed for a total of 42 metered gas consuming facilities. Completed High Performance Sustainable Buildings thermal metering & WAGES installations. Completed High Performance Sustainable Buildings Guiding Principle implementation in 60-175, 63-0033, 63-111, 03-1411.	Mitigation Complete	Continue to implement LANL SSP and the LTSESS and close this mitigation through the Field Office.	ADNNHO/ ENV Division Field Office
	Install more efficient gas-fired combustion turbine generators and upgrade existing steam turbines to conserve power and energy.		Rolls-Royce Combustion Gas Turbine Generator was installed in 2009.	Mitigation Complete	Close out mitigation through the Field Office.	N/A
3.16 Energy Conserv-ation: Water	Expand the SERF and take advantage of additional opportunities to increase the amount of recycled water usage and reduce water consumption at LANL.	2008 ROD for the LANL SWEIS (Sept. 2008)	Expansion complete August 2012 Operated SERF to reuse 20 million gallons of water.	Mitigation Complete	Continue to implement LANL SSP and the LTSESS and close this mitigation through the Field Office.	ADEP/ ADNNHO

Topic	Mitigation Action Commitment	NEPA Driver	Actions Taken	Effectiveness of Mitigation	Recommendation	Responsible Party
	Promote water conservation projects and plans that contribute to compliance with DOE Order 430.2B.		Design complete and construction started for 5 site-level water meters.	Mitigation Complete	Continue to implement LANL SSP and the LTSESS and close this mitigation through the Field Office.	ADNNHO Field Office – SSP manager
3.17 P2	Annually report waste reduction performance against EMS waste reduction goals.	DOE O 450.1 (June 2008) Module VIII, Section B.1, of LANL's Hazardous Waste Facility Permit (NM0890010515-1; Jan. 2013)	PPTRS Integrated into EMS and SSP.	Mitigation Complete	Continue to implement LANL SSP and the LTSESS and close this mitigation through the Field Office.	ENV-ES Field Office – EMS/P2 Program Manager
	Continue to integrate waste reduction activities into LANL's EMS.		Goals in FY 2013 EAPs. Integrated into EMS.	Mitigation Complete	Continue to implement LANL SSP and the LTSESS and close this mitigation through the Field Office.	ENV-ES
3.18 Clean Fill	Use excavation and demolition spoils locally to minimize purchase or new excavations of clean fill when feasible.	2008 ROD for the LANL SWEIS (Sept. 2008)	Database integrated with PRID; yard operational.	Mitigation Complete	Close out mitigation through the Field Office. UI-DO will continue to operate the clean fill yard.	UI-DO MSS Division ES Division
	Report annually on reuse of clean fill materials from excavations and DD&D.		Data tracked in the PPTRS.	Mitigation Complete	Continue to implement LANL SSP & PPTRS and close this mitigation through the Field Office.	ENV-ES
3.19 Traffic Mitigations	Identify possible solutions (e.g., schedule activity for off-peak hours, reroute truck traffic, construct alternative roads, use multiple shifts, and use alternative entries and exits) to minimize traffic issues for Royal Crest Mobile Home Park and the Los Alamos Town Center related to DD&D, remediation, and site closure projects.	MAP and 2008 ROD for the LANL SWEIS (Sept. 2008) DOE Order 430.2B (Feb. 2008)	No alternate route required.	N/A	Close out mitigation through the Field Office.	N/A

Topic	Mitigation Action Commitment	NEPA Driver	Actions Taken	Effectiveness of Mitigation	Recommendation	Responsible Party
	Encourage alternative transportation, including walking, car-pooling, bicycling, and public transportation.		Ongoing EMS communications. Redesigned Gamma Ray Road, to include a pedestrian walkway and bike lane from Pajarito Road to TA-48. Completed design standards for trail improvements throughout the Laboratory. Integrated into EMS	Mitigation not measurable.	Develop measureable mitigation or close out mitigation through the Field Office.	ENV Division OI-PO
	Consider plans for an alternative route off DP Mesa.		No alternate route required.	Mitigation Complete	Close out mitigation through the Field Office.	N/A
Enhancement of Existing Programs						
3.20 Site Planning	Enhance the decision support tool to offer an objective and semi-quantitative method for integrating opportunities and constraints for project planning and compliance.	MAP and 2008 ROD for the LANL SWEIS (Sept. 2008)	Task Complete; DSA training ongoing. ILMP complete.	Mitigation Complete	Close out mitigation through the Field Office. Continue use of, and training for, the DSA tool.	OI-PO
	Use Project Review and Requirements System in concert with the decision support tool and project site selection process to better identify potential site planning constraints early in project development.		Ongoing integration with PRID and DSA.	Mitigation is effective	Recommend modifying this mitigation to make it measurable.	OI-PO ENV Division
	Use the decision support tool to comply with Land Transfer Regulations (10 CFR 770).		N/A	Mitigation Complete DSA is complete.	Close out mitigation through the Field Office.	N/A
3.21 Compli-ance Assurance	Implement compliance assurance process on a sample of PRID projects.	MAP and 2008 ROD for the LANL SWEIS (Sept. 2008)	Compliance Assurance Subtask Pilot Project Final Report—FY 2009 LA-UR-09-06307 Compliance Assurance Subtask Pilot Project Final Report—FY 2010 LA-UR-10-07064	Mitigation Complete	Close out mitigation through the Field Office.	N/A
	Develop metrics and track results.		N/A	Mitigation Complete	Close out mitigation through the Field Office.	N/A

Topic	Mitigation Action Commitment	NEPA Driver	Actions Taken	Effectiveness of Mitigation	Recommendation	Responsible Party
	Formally assign a functional manager for the PR-ID process and support tool and ensure supporting authority and funding for effective use in project development, compliance, and site planning.		N/A	Mitigation Complete	Close out mitigation through the Field Office.	N/A
	Implement process improvement measures as appropriate.		Ongoing integration of DSA and PRID.	Mitigation is effective	Complete integration of DSA and PRID in FY 2014.	ENV-ES
Commitments to Santa Clara Pueblo						
3.22 Consulta-tions with Santa Clara Pueblo	No later than January 30, 2009, DOE/NNSA LASO shall develop a plan jointly with Santa Clara Pueblo to address environmental justice and human health concerns and issues identified by the Santa Clara Pueblo during the SWEIS process. The plan will include specific tasks and timelines, and identify the necessary NNSA and Pueblo resources to help ensure implementation of the plan. In consultation with Santa Clara Pueblo, NNSA LASO will update the MAP to incorporate these actions.	MAP and 2008 ROD for the LANL SWEIS (Sept. 2008)	A draft Plan was submitted to NNSA for review and comment during the 1st quarter of FY 2013. The Governor of the Pueblo, on behalf of the Tribal Council, agreed to proceed with comment reconciliation and finalization of the plan during the third quarter. The status is ongoing.	Mitigation is effective	Field Office continues to provide support to Santa Clara Pueblo to develop a draft plan for Tribal Council review.	DOE/NNSA Field Office – Intergovern-mental Programs (Tribal Affairs) in conjunction with Santa Clara Pueblo

Appendix II

Dual-Axis Radiographic Hydrodynamic Test Facility

Mitigation Action Plan Annual Report Covering FY 2012

Prepared by Philip R. Fresquez
Environmental Stewardship Resources Management Team (ENV-ES)

Dual-Axis Radiographic Hydrodynamic Test Facility

Mitigation Action Plan

Annual Report Covering FY 2012

Prepared by:
Department of Energy Los Alamos Site Office
National Nuclear Security Administration

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ACRONYMS

BA	Biological and Floodplain/Wetland Assessment
BSRL	baseline statistical reference level
CRT	Cultural Resources Team
DARHT	Dual-Axis Radiographic Hydrodynamic Test (facility)
DOE	U.S. Department of Energy
EIS	Environmental Impact Statement
ENV-EAQ	Ecology and Air Quality (group)
ENV-ES	Environmental Stewardship (group)
ENV-RCRA	Water Quality and RCRA [Resource Conservation and Recovery Act] (group)
ENV-RRO	Risk Reduction Office
ER	Environmental Report
FY	fiscal year
HAZMAT	Hazardous Materials Response Team
HMP	habitat management plan
ISL	industrial screening level
ISM	Integrated Safety Management (system)
LANL	Los Alamos National Laboratory
LASO	Los Alamos Site Office
MAP	Mitigation Action Plan
MAPAR	Mitigation Action Plan Annual Report
NCB	NEPA, Cultural, and Biological
NEPA	National Environmental Policy Act of 1969
NNSA	National Nuclear Security Administration
NPDES	National Pollutant Discharge Elimination System
RESRAD	residual radioactivity (computer model)
RMT	Resources Management Team
ROD	Record of Decision
RSRL	regional statistical reference level
SEA	Special Environmental Analysis
SHPO	State Historic Preservation Officer
SL	screening level
SWEIS	Site-Wide Environmental Impact Statement
SWPPP	Stormwater Pollution Prevention Plan
TA	technical area
TAL	target analyte list
TCP	traditional cultural property
TNT	trinitrotoluene(2,4,6-)
VPB	Vessel Preparation Building
WES-EDA	Waste and Environmental Services Division, Environmental Data and Analysis (group)
WFO-FOD	Weapons Facilities Operations, Facilities Operations Directorate
WPA	Work Package Agreement

EXECUTIVE SUMMARY

In fiscal year (FY) 2012 there were no significant impacts from contaminants based on measurements of soil, sediment, vegetation, field mice, and bees from Dual-Axis Radiographic Hydrodynamic Test (DARHT) operations. DARHT operations did not have significant impacts to the bird populations. There are no impacts from DARHT operations to archaeological resources (i.e., Nake'muu pueblo) and the natural environment is having a greater effect on the deterioration of the standing wall architecture than operations at DARHT. Although 2012 contaminant levels were not at concentrations detrimental to human health or to the environment, there were measurable amounts of depleted uranium in all media and the levels increase over time until 2006. Concentrations of depleted uranium in most media decreased in 2007 and may correspond to the success of employing steel containment vessels and/or to a reduction of detonations. However, since increases of uranium in all media were noted until at least 2006 and uranium may linger in soils for some time, monitoring of these media will continue until the concentrations are similar to baseline statistical reference levels. Foam mitigation has significantly reduced the amount of potential contaminants released into the environment compared with open-air detonations, and the use of steel containment vessels further reduced those amounts over foam mitigation.

1.0 INTRODUCTION

This Mitigation Action Plan Annual Report (MAPAR) has been prepared by the U.S. Department of Energy (DOE) National Nuclear Security Administration (NNSA) as part of implementing the Dual-Axis Radiographic Hydrodynamic Test (DARHT) Facility Mitigation Action Plan (MAP; DOE 1996). This MAPAR provides status on specific DARHT facility operations-related mitigation actions that have been implemented to fulfill DOE commitments under the DARHT Environmental Impact Statement (EIS) Record of Decision (ROD; DOE 1995) and MAP and the 2008 Site-Wide EIS (SWEIS) MAP (DOE 2008). In January 2009, the SWEIS MAP was finalized; it includes outstanding 1999 SWEIS MAP commitments, all continuing mitigations from National Environmental Policy Act of 1969 (NEPA) decisions made since the 1999 SWEIS, and those made in the September 2008 and June 2009 SWEIS RODs. Although no new commitments were identified for DARHT, some of the earlier commitments were completed; for example, the need to continue the archeological monitoring of Nake'muu, the only ancestral pueblo at Los Alamos National Laboratory (LANL) retaining its original standing walls.

The DOE NNSA Los Alamos Site Office (LASO) is responsible for implementing the DARHT MAP, which is now included in the 2008 SWEIS MAP. In June 2004, DOE provided stakeholders with the first MAPAR, complete with the full scope of commitments and action plans implemented under the DARHT MAP during fiscal year (FY) 2003. This MAPAR reports on the full scope of actions that were implemented during FY 2012 (October 1, 2010, through September 30, 2012) and represents the 13th year of DARHT facility operations-related mitigation measures and action plans. All construction-related mitigation measures and action plans were completed in FY 1999 (LANL 1999).

1.1 Background

DOE issued the final EIS on the DARHT facility (DOE/EIS-0228) at LANL in August 1995 and published the ROD in the Federal Register (60 FR 53588) on October 16, 1995. The DARHT MAP is being implemented consistent with DOE regulations under the NEPA as stated in DOE's Final Rule and Notice for Implementing NEPA (10 Code of Federal Regulations [CFR] 1021, section 331(a), revised July 9, 1996).

The ROD on the DARHT final EIS states that DOE has decided to complete and operate the DARHT facility at LANL while implementing a program to conduct most tests inside steel containment vessels with containment to be phased in over 10 years (the Phased Containment option of the Enhanced Containment alternative[2]). In general, open-air detonations occurred from 2000–2006 and detonations within a foam medium occurred from 2002–2006. A containment vessel qualification shot was conducted at the Technical Area 39 (TA-39) Firing Point 6 in 2006, and shots within steel containment vessels at DARHT were implemented in May of 2007. Overall, three hydrodynamic test shots within steel containment vessels at DARHT were conducted in FY07, two in FY08, none in FY09, four in FY10, three in FY11, and six in FY 2012.

The ROD further states that DOE will develop and implement several mitigation measures to protect soils, water, and biotic and cultural resources potentially affected by the DARHT facility

[2] In addition to containment with vessels, additional mitigation measures for use at DARHT are ongoing. These include aqueous foam for particulate mitigation that is aimed at reducing release of materials from test shots.

construction and operation (DOE 1995). In addition, DOE agreed to an ongoing consultation process with affected American Indian tribes to ensure protection of resources of cultural, historic, or religious importance to the tribes. As discussed in Section 5.11, Volume 1, of the DARHT Final EIS, DOE also committed to taking special precautions to protect the Mexican spotted owl (*Strix occidentalis lucida*) by preparing and implementing a Laboratory-wide habitat management plan (HMP; LANL 2011) for all threatened and endangered species occurring throughout LANL. The DARHT MAP elaborates upon those commitments (DOE 1996).

In December 1995, LANL completed a Biological and Floodplain/Wetland Assessment (BA) for the DARHT facility as required under the Endangered Species Act of 1973 (Keller and Risberg 1995). The BA includes mitigation expected to prevent any likely adverse effect to any threatened or endangered species or modification to critical habitat. The mitigation measures identified in the BA were the basis for U.S. Fish and Wildlife Service concurrence with a finding of "may affect, but not likely to adversely affect," and have been used as the basis for establishing mitigation commitments and action plans for potential impacts to threatened or endangered species and critical habitat as identified in the DARHT MAP. These BA mitigation measures, through implementation of the DARHT MAP, have established some of the guidelines under which the DARHT facility was constructed and will be operated to mitigate the identified potential impacts.

1.2 MAP Function and Organization

The functions of the DARHT MAP are to (1) document potentially adverse environmental impacts of the Phased Containment option delineated in the final DARHT EIS, (2) identify commitments made in the final EIS and ROD to mitigate those potential impacts, and (3) establish action plans to carry out each commitment (DOE 1996).

The DARHT MAP is divided into eight sections: Sections I through V provide background information regarding the NEPA review of the DARHT facility project and an introduction to the associated MAP. Section VI references the Mitigation Action Summary Table, which summarizes the potential impacts and mitigation measures; indicates whether the mitigation is design-, construction-, or operations-related; summarizes the organization responsible for the mitigation measure; and summarizes the projected or actual completion date for each mitigation measure. Sections VII and VIII discuss the MAPAR commitment and the potential impacts, commitments, and action plans.

Under Section VIII, potential impacts are categorized into the following five areas of concern:

- general environment, including impacts to air and water;
- soils, especially impacts affecting soil loss and contamination;
- biotic resources, especially impacts affecting threatened and endangered species;
- cultural/paleontological resources, especially impacts affecting the archaeological site known as Nake'muu; and
- human health and safety, especially impacts pertaining to noise and radiation.

Each category includes a brief statement of the nature of the impact and its potential cause(s). The commitment made to mitigate the potential impact is identified. The action plan for each commitment is described in detail with a description of actions to be taken, pertinent time frames for the actions, verification of mitigation activities, and identification of agencies/organizations responsible for satisfying the requirements of the commitment.

1.3 MAP Duration and Closeout

The DARHT MAP will be implemented for the operational life (about 30 years) of the DARHT facility (DOE 1996). Within the DARHT MAP, each DOE commitment and action plan specifies a time frame, verification strategy, and responsible agency/organization. The MAP also includes a summary of mitigation actions that identifies the projected/actual period of mitigation action completion. Each mitigation action time frame correlates with one or more of the following DARHT facility project stages: design, construction, and operations. This information generally refers to when an individual action will be initiated and completed. All construction-related mitigation measures were completed in FY 1999 (LANL 1999).

1.4 DARHT Facility Schedule and Status

The court-ordered injunction on DARHT facility construction was lifted on April 16, 1996, and DOE authorized resumption of construction activities on April 26, 1996. The DARHT facility construction contractor was fully mobilized on August 23, 1996, and full-scale construction was authorized and began on September 30, 1996. In July 1999, with the appropriate DOE authorization, the DARHT Project Office initiated DARHT facility operations on the DARHT first axis.

During the late summer of 2000, two very simple high-explosive shots using 16 lb of TNT (trinitrotoluene[2,4,6-]) were performed. The purpose of these two experiments was to acquire accelerometer data on the building at the Nake'muu archaeological site. In the late fall of 2000, the first major hydrotest using the DARHT first axis was performed, fragment mitigation measures were in place, and postshot cleanup was conducted to minimize the release of contaminants to the environment.

In the summer of 2001, one major system checkout experiment and three major hydrotests were performed. Fragment mitigation measures were in place and postshot cleanup was conducted to minimize the release of contaminants to the environment. Each of the four experiments returned state-of-the-art quantitative radiographic information. The final three hydrotests illuminated the complex hydrodynamics of mockups of stockpiled systems.

In the fall of 2002, hydrotesting continued with two major experiments that again returned state-of-the-art quantitative radiographic information of mockups of stockpiled systems. Fragment mitigation measures were in place and postshot cleanup operations were conducted. An aqueous foam containment method of particulate containment and blast mitigation was tested at another firing site for implementation at DARHT. Also during 2002, the DARHT Project continued the major installation of the injector and accelerator components of the second axis. Two major DARHT second-axis commissioning milestones were achieved in 2002. On July 2, 2002, the second-axis injector achieved conceptual design-4a early with e-beam parameters of >250 amps at >2.0 MeV. On December 21, 2002, the full accelerator achieved the technical criteria of conceptual design-4d with e-beam parameters of >1.0 kA at >12.0 MeV for longer than 400 nanoseconds.

In 2003, the construction of the Vessel Preparation Building (VPB) was completed. One hydrotest was fired in the fall of 2003 and again returned state-of-the-art quantitative radiographic information of a mockup of a stockpile system. This experiment was the initial implementation of aqueous foam mitigation for a hydrotest experiment at DARHT. The aqueous foam mitigation method achieved at least a 5% reduction in material released to the open air as

prescribed for Phase I of the Phased Containment option. Steel plates and concrete replaced surface gravel at the firing pad to enhance cleanup activities following experiments.

In FY 2004, two major hydrotests were conducted. Aqueous foam particulate mitigation was implemented during these experiments to mitigate blast effects. One of these experiments was the first foam-mitigated experiment to use the new fabric tent configuration for containing the foam.

In FY 2005, hydrotesting continued with three major hydrotest experiments. Fragment mitigation was implemented during these experiments to mitigate blast effects. Aqueous foam particulate mitigation using a fabric tent configuration for containing the foam was implemented during these experiments to mitigate blast effects.

In FY 2006, hydrotesting continued with three major hydrotest experiments. Aqueous foam particulate mitigation using a fabric tent configuration for containing the foam was again implemented during these experiments to mitigate blast effects. The VPB underwent a Phase II readiness review in FY 2006 and was approved to begin operations including the staging, preparation, and decontamination of containment vessels.

In FY 2007 through 2012, single-walled steel containment vessels were used for all hydrotest experiments to mitigate the fragments and particulate emissions associated with the experiment. These steel containment vessels achieved at least a 40% reduction in material released to the open air as prescribed for Phase II of the Phased Containment option. The steel vessels were decontaminated on the DARHT firing point and transported to the VPB, where they were prepared for the next experiment. A major DARHT second-axis commissioning milestone was achieved in FY 2007. The DARHT Axis II team successfully kicked four pulses through to the target on the scaled accelerator. Each of the four pulses was 35 nanoseconds in duration and uniformly spaced 400 nanoseconds apart. The kicker and downstream transport system performed extremely well. Overall, three hydrodynamic test shots within steel containment vessels at DARHT were conducted in FY07, two in FY08, none in FY09, four in FY10, three in FY11, and six in FY 2012.

2.0 MAP IMPLEMENTATION

The DARHT MAP is implemented on an annual basis in coordination with the federal FY funding cycle. At the beginning of each FY, the DARHT MAP mitigation actions are reviewed and formalized in a LANL work package agreement (WPA). Following WPA authorization, the mitigation actions are initiated. On an annual basis, critical information and data gathered during the mitigation actions are analyzed and summarized; these results are published in the MAPAR.

The DOE/NNSA LASO NEPA Compliance Officer, who is ultimately responsible for implementing the DARHT MAP, delegates MAP management and tracking to LANL organizations; currently the Environmental Stewardship Group (ENV-ES) manages the MAP. Using the annual WPA, ENV-ES coordinates with the appropriate LANL organizations to ensure mitigation action implementation and to prepare the annual report.

The function of the MAPAR is to fulfill DOE's commitment to the stakeholders to report the general status and critical information regarding activities associated with implementation of the DARHT MAP. The MAPAR reflects new information or changed project and environmental circumstances and should report changes in mitigation actions or to the MAP. In order to ensure

the public has full access to this information, the MAPAR is placed in the Los Alamos and Albuquerque DOE Public Reading Rooms.

The organization of the MAPAR is intended to provide the reader with a clear understanding of the scope and status of mitigation actions implemented annually under the DARHT MAP. The MAPAR consists of the following main sections: introduction and background; MAP implementation; MAP scope, schedule, and status including results on potential impacts; and conclusions and recommendations, including future MAP implementation.

3.0 DARHT MAP SCOPE, SCHEDULE, AND STATUS

This MAPAR documents the scope and results of mitigation action tasks that were implemented throughout FY 2012. The scope of tasks completed in FY 2012 represents the 13th year of operations-related mitigation. Table 3-1 provides a summary of the scope of potential impacts and commitments addressed in this MAPAR.

Table 3-1: Summary of Potential Impacts and Commitments Addressed in this MAPAR

DARHT MAP Potential Impacts/Commitments	DARHT Phase	MAPAR Section
A. General Environment		
1. Contamination of the environment surrounding DARHT facility with radioactive or hazardous material: Commitments (b–e)	Operations	3.1
2. Contamination of the environment with various types of wastes as a result of cleaning out the containment vessels	Operations	3.1
3. Contamination of the environment with various types of hazardous materials as a result of spills within the DARHT facility	Operations	3.1
4. Contamination of the environment with hazardous levels of various substances as a result of discharges of contaminated water from the DARHT facility	Operations	3.1
B. Soil		
1. Loss of soil and vegetation could occur during construction and operation of the DARHT facility as a result of severe stormwater runoff: Commitments (a–c).	Operations	3.2
2. Soil erosion and damage to plants caused by additional construction and operations activities, especially off-road and groundbreaking activities: Commitments (a–e)	Operations	3.2

DARHT MAP Potential Impacts/Commitments	DARHT Phase	MAPAR Section
C. Biotic Resources		
1. DARHT facility construction and operations could impact threatened and endangered species as a result of impacts from firings and other operations and activities at the firing sites: Commitments (b–d).	Operations	3.3
2. DARHT facility construction and operation could impact the Mexican spotted owl as a result of noise from firings and other operations, as well as other activities at the firing sites: Commitments (n–x).	Operations	3.3
3. DARHT facility construction and operation could impact the American peregrine falcon (*Falco peregrinus anatum*) as a result of noise from firings and other operations, as well as other activities at the firing sites: Commitments (a, b).	Operations	3.3
4. DARHT facility construction and operation could impact the northern goshawk (*Accipiter gentilis*) as a result of noise from firings and other operations, as well as other activities at the firing sites: Commitments (a–c).	Operations	3.3
5. DARHT facility construction and operation could impact the spotted bat (*Euderma maculatum*) as a result of noise from firings and other operations, as well as other activities at the firing sites.	Operations	3.3
6. DARHT facility construction and operation could impact the New Mexico meadow jumping mouse (*Zapus hudsonius luteus*) as a result of noise from firings and other operations, as well as activities at the firing sites.	Operations	3.3
7. DARHT facility construction and operation could impact the Jemez Mountains salamander (*Plethodon neomexicanus*) as a result of noise from firings and other operations, as well as other activities at the firing sites: Commitments (a, b).	Operations	3.3
8. DARHT facility construction and operation could impact the bald eagle (*Haliaeetus leucocephalus*) as a result of noise from firings and other operations, as well as other activities at the firing sites: Commitments (a, b).	Operations	3.3
9. DARHT facility construction and operation could impact the Townsend's pale big-eared bat (*Corynorhinus townsendii*) as a result of noise from firings and other operations, as well as other activities at the firing sites: Commitments (a, b).	Operations	3.3
10. DARHT facility construction and operation could impact the wood lily (*Lilium philadelphicum* var. *andinum*) as a result of firings and other operations, as well as other activities at the firing sites: Commitments (a, b).	Operations	3.3
D. Cultural/Paleontological Resources		
1. Blast effects, such as shock waves and flying debris, from shots using high-explosive charges could affect nearby archaeological sites, especially Nake'muu, and the immediately surrounding environment: Commitments (b, e–g).	Operations	3.4
2. Structural or other damage to as-yet-unknown Native American cultural resources within the area of potential effects for the DARHT facility site. This could occur as a result of DOE's lack of knowledge of these resources in the DARHT facility area: Commitments (a, b).	Construction/ Operations	3.4
E. Human Health and Safety		
1. Adverse health effects on workers and the general public from high noise levels associated with the DARHT facility, especially construction and test firings: Commitment (a)	Construction/ Operations	3.5
2. Adverse health effects on workers from radiation from DARHT facility operations: Commitments (a–c)	Operations	3.5

3.1 Mitigation Actions for the General Environment

Summary of Potential Impacts

MAP Section VIII.A.1(b–e)

The DARHT MAP identifies the potential for hazardous and radioactive materials to be released to the general environment surrounding the DARHT facility. Hazardous and radioactive materials could be released to the general environment through the following mechanisms: a structural failure of containment vessels or during open-air firing operations; release of various types of waste as a result of cleaning out the containment vessels; release of various hazardous materials as a result of spills within the DARHT facility; and release of hazardous levels of various substances as a result of discharges of contaminated water from the DARHT facility.

Mitigation Action Scope

The operational mitigation actions associated with these potential impacts are as follows:

b) ENV-ES will monitor contaminants by sampling soil, plants, mammals, birds, and bees at baseline locations and, following the start of operations, within the potential impact area of DARHT, once per year.

c) Other site monitoring and evaluation will consist of periodic soil, water, and other environmental analyses for solid, hazardous, mixed, and radioactive wastes should spills or other unplanned events occur.

d) Double- and single-walled steel containment vessels will be used appropriately.

e) Vessels will be decontaminated.

Status

MAP Section VIII.A.1(b)

Since 1996, soil, sediment, vegetation, honey bee, and small mammal tissue samples have been collected from around the DARHT facility and analyzed during the construction phase (1996–1999) for baseline conditions. The results of 4 yr of analysis of DARHT samples are summarized in a composite report (Nyhan et al. 2001) and were used to calculate baseline statistical reference levels (BSRLs); these are the concentrations of radionuclides and other chemicals (mean plus 3 standard deviations = 99% confidence level) around the DARHT facility before the start-up of operations, as per the DARHT MAP (DOE 1996). Baselines for potential contaminants, populations, and species diversity in birds were developed at a later date (Fresquez et al. 2007).

In FY 2000, operations-phase environmental monitoring was initiated by collecting a suite of samples similar to those collected during the construction phase. Monitoring environmental media in the years to come will continue to assess cumulative impact by documenting accumulations of contaminants in the environmental media.

This section of the MAPAR summarizes the results of analyses of soil, sediment, vegetation, field mice, birds, and bees collected around the perimeter of DARHT during FY 2012 (Figure 3-1). All of the raw data can be found in the annual Environmental Report (ER) (LANL, in preparation).

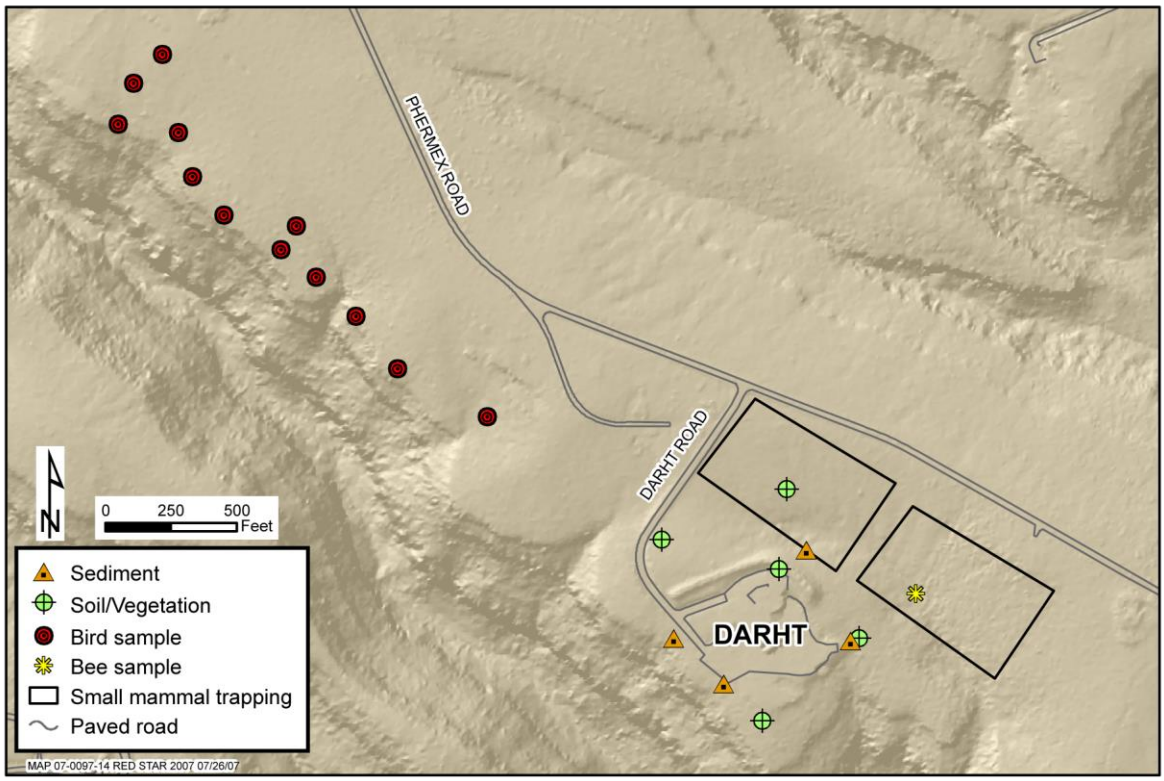

Figure 3-1. Sample locations for soil, sediment, vegetation, field mice, birds, and bees around DARHT

Soil and Sediment Monitoring. Soil samples were collected near the firing point and around the perimeter of the DARHT facility on the north, east, south, and west sides (see Figure 3-1). In addition, sediment samples were collected on the north, east, south, and southwest sides. All samples were submitted to ALS Laboratory Group, under chain-of-custody procedures for the analysis of tritium, plutonium-238, plutonium-239/240, strontium-90, americium-241, cesium-137, uranium-234, uranium-235, uranium-238; 23 target analyte list (TAL) chemicals; and high explosives. In addition, dioxins and furans were analyzed by Cape Fear Analytical, LLC, in one soil sample collected nearest the firing point.

We compared the radionuclide and TAL element results in soil and sediment from the DARHT sampling with both BSRLs and regional statistical reference levels (RSRLs). RSRLs are the upper-level background concentration (mean plus 3 standard deviations = 99% confidence level) derived from soil collected from regional areas away from the influence of the Laboratory. RSRLs represent natural and fallout sources, are calculated as data become available, and can be found in the ER.

The use of both reference levels is employed because the BSRLs for some radionuclides and chemicals may be biased as a result of changes in pre- and postsampling locations and the change in analytical techniques.

Most radionuclides in soil and sediment collected from within and around the perimeter of the DARHT facility were either not detected or below the statistical reference levels. A nondetected value is one in which the result is lower than 3 times the counting uncertainty and is not

significantly different ($\alpha = 0.01$, or 99% confidence level) from 0 (Keith 1991, Corely et al. 1981) or less than the minimum detectable activity. Those few radionuclides, however, that were above the statistical reference levels were far below the industrial SLs and do not pose an unacceptable dose to any site workers.

The only radionuclides in soil and sediments around the DARHT site that consistently measure higher than the (baseline) reference level over the years are the uranium isotopes, primarily uranium-238 in the soil sample nearest the firing point. Because open-air detonations occurred from 2000 through 2006, it would not be uncommon to find particles of depleted uranium in the soil around the site. Uranium-238 concentrations in the soil sample collected nearest the firing point peaked in 2008 (55 pCi/g dry), and because operations have changed to include the use of closed containment vessels (and subsequent cleanup of debris around the site), the concentrations of uranium-238 within the facility have decreased dramatically to baseline levels. In contrast, the concentrations of uranium-238 in soil samples collected around the perimeter of the DARHT facility have generally remained close to the baseline levels. This year, however, one soil sample out of the four collected measured higher than normal for uranium-238—the north perimeter soil sample measured 39 pCi/g, which accounts for the spike in 2012. (Note: The amounts were far below the industrial screening levels (ISLs) and do not pose an unacceptable dose to any site workers. ISLs for radionuclides are set below the DOE single-pathway dose limit of 25 mrem/yr (DOE 1993, DOE 1999a) so that potential concerns may be identified in advance, i.e., a "yellow flag." If a radionuclide exceeds the ISL, we investigate the basis for the exceedance. LANL developed ISLs to identify radionuclides of potential concern on the basis of a 15-mrem/yr protective dose limit for an industrial site worker scenario (LANL 2005a) using the residual radioactivity (RESRAD) computer model (Yu et al. 1995).)

In the past, uranium isotopes, predominantly uranium-238, were detected above the BSRL in soil samples collected on the north side of the firing point (Figure 3-2). Uranium-238 concentrations peaked in 2008 (55 pCi/g dry) and since operations have changed to closed containment vessels (and subsequent cleanup of debris around the site), the concentrations of uranium-238 within and around the facility have decreased dramatically to baseline levels. See MAP Section VIII.A.1(d) for more information and results concerning the use of steel containment vessels.

All of the TAL elements, including beryllium, in soil and sediment samples collected within and around the DARHT facility were below both the statistical reference levels. Beryllium, listed as a chemical of concern before the start-up of operations at DARHT (DOE 1995), was not detected in any of the soil or sediment samples above reference levels. Also, beryllium concentrations in soil over the 13-yr operations period have been mostly below the BSRL, far below ISLs, and remain relatively stable over time (Figure 3-3).

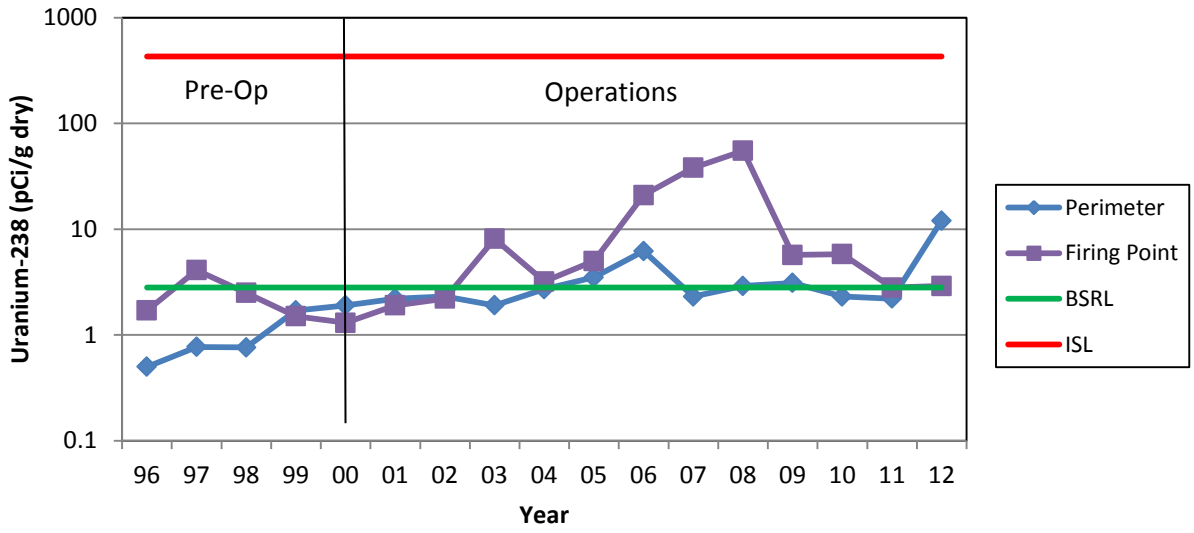

Figure 3-2. Uranium-238 concentrations in soil collected within (near the firing point) and around (north-, east-, south-, and west-side average) the DARHT facility at TA-15 from 1996–1999 (preoperations) to 2000–2012 (during operations) compared with the BSRL and the ISL. Note the logarithmic scale on the vertical axis.

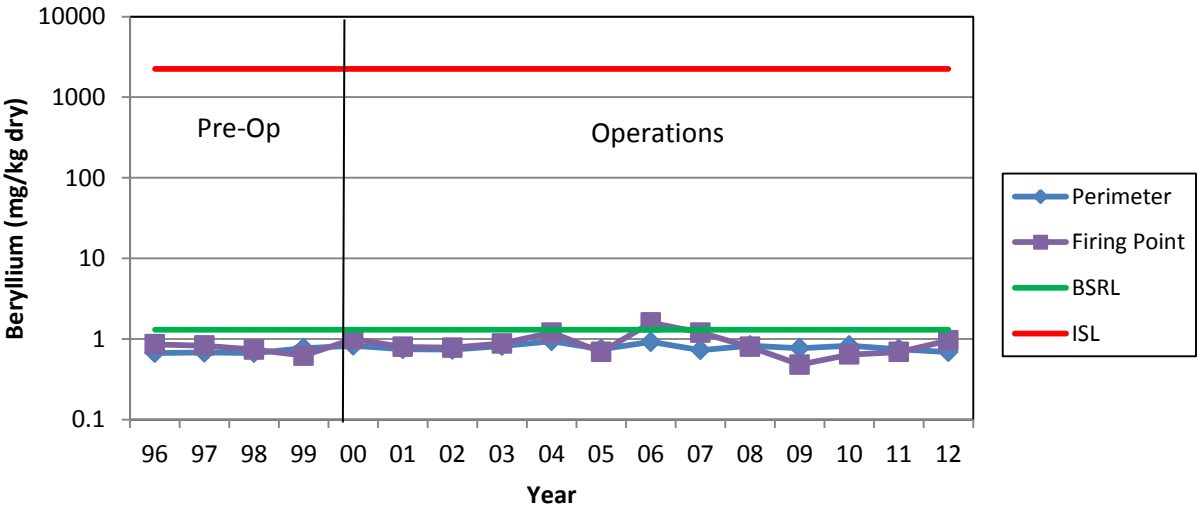

Figure 3-3. Beryllium concentrations in soil collected within (near the firing point) and around the DARHT perimeter (north-, west-, south-, and east-side average) at TA-15 from 1996–1999 (preoperations) to 2000–2012 (during operations) compared with the BSRL and the ISL. Note the logarithmic scale on the vertical axis.

None of the 20 HE chemicals analyzed were detected above the method detection limits MDL in any of the soil or sediment samples collected within and around the perimeter of the DARHT facility, including the sample closest to the firing point. Also, most dioxins and furans were not detected above the MDLs in the soil sample nearest the firing point. (Note: Trace amounts [>MDL<Detection Limit] of 1,2,3,4,6,7,8-heptachlorodibenzodioxin and 1,2,3,4,6,7,8,9-

octachlorodibenzodioxin were found. Also, trace amounts of 1,2,3,4,6,7,8-heptachlorodibenzodioxin were detected last year.)

Although not analytically surveyed for in 2012, no polychlorinated biphenyls or semivolatile organic compounds in soil and sediment samples collected around the perimeter of the DARHT facility in 2007 were detected above the reporting limits.

Vegetation Monitoring. Overstory (tree needles and branch) vegetation samples were collected on the north, south, west, and east sides of the DARHT complex and submitted to ALS Laboratory Group for the analyses of the same radionuclides and TAL chemicals as for soil.

All radionuclide concentrations, including uranium-238 (Figure 3-4), in overstory vegetation collected from around the perimeter of the DARHT facility were either not detected (most results) or detected below the BSRLs (or RSRLs when BSRL data were not available). In the past, uranium-238 was usually the only radionuclide to be detected in overstory vegetation around the DARHT facility (probably as a result of foliar deposition more than by root uptake), but since 2007 the concentrations have generally decreased from all sides of the DARHT perimeter. This general decrease in uranium-238 concentrations to the BSRL was probably due to the change in contaminant mitigation procedures from open-air and/or foam mitigation (2000–2006) to closed steel containment (vessel) mitigation starting in 2007. (Note: The uranium-238 concentration in overstory vegetation collected from the north side of the perimeter of DARHT does not reflect the higher-than-normal concentration in soil from that location.

Screening levels (SLs) for biota were set at 10% of the standard by the dose assessment team at the Laboratory to identify the potential contaminants of concern (McNaughton 2006).

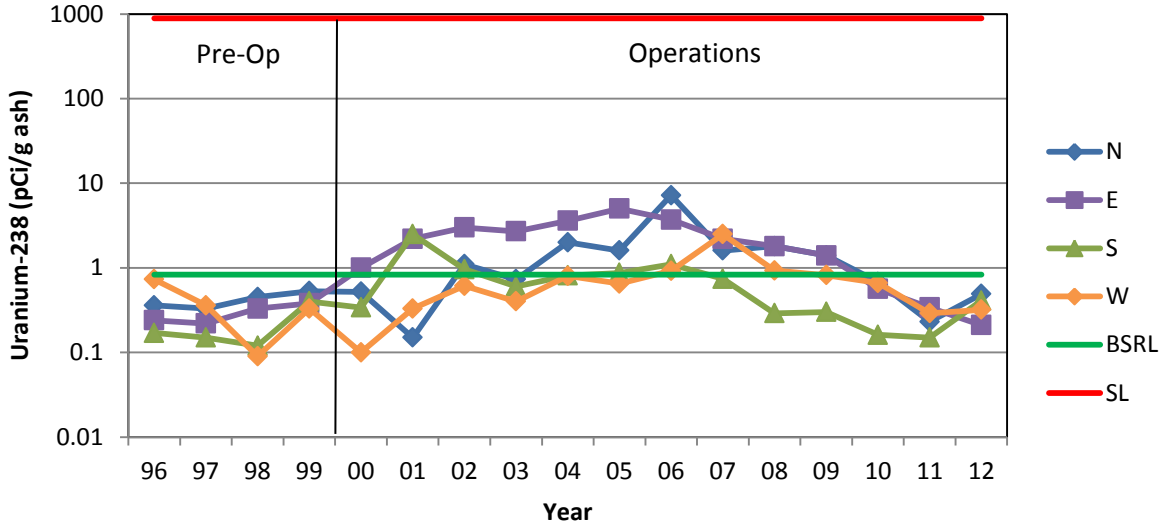

Figure 3-4. Uranium-238 in overstory vegetation collected from the north (N), east (E), south (S), and west (W) side of the DARHT facility at TA-15 from 1996–1999 (preoperations) through 2000–2012 (during operations) compared with the BSRL and the SL. Note the logarithmic scale on the vertical axis.

The results for the 23 TAL elements, including metals like beryllium and mercury, in overstory vegetation collected from around the DARHT facility show that all of the elements were either below the detection limits or detected below the BSRLs (or below the RSRLs when BSRL data were not available).

Small Mammal Monitoring. Small mammals, mostly deer mice (*Peromyscus* spp.), are collected using snap traps from two sample grids located on the north and northeast side of the DARHT facility. Samples of whole-body mice were submitted to ALS Laboratory Group for analyses of the same radionuclides and TAL elements as for the other biota.

All radionuclides in a composite field mouse sample (n=7) collected from the north and northeast side of the DARHT facility were either not detected (most results) or below the BSRLs. The isotopic distribution of uranium-234 to uranium-238 in the field mouse sample collected from the north-northeast side of DARHT indicates the type of uranium is depleted uranium.

Using uranium-238 concentrations to model trends over time, the amounts, as seen with vegetation, exhibit an increase to 2007 and then decrease thereafter to the BSRL; this is concurrent with the change in detonation mitigation practices from open-air and/or foam-mitigated detonations during the 2000–2006 period to closed vessel containment starting in 2007 (Figure 3-5). (Note: The uranium-238 concentration in small mammals collected from the north side of the perimeter of DARHT does not reflect the higher-than-normal concentration in soil from that location.)

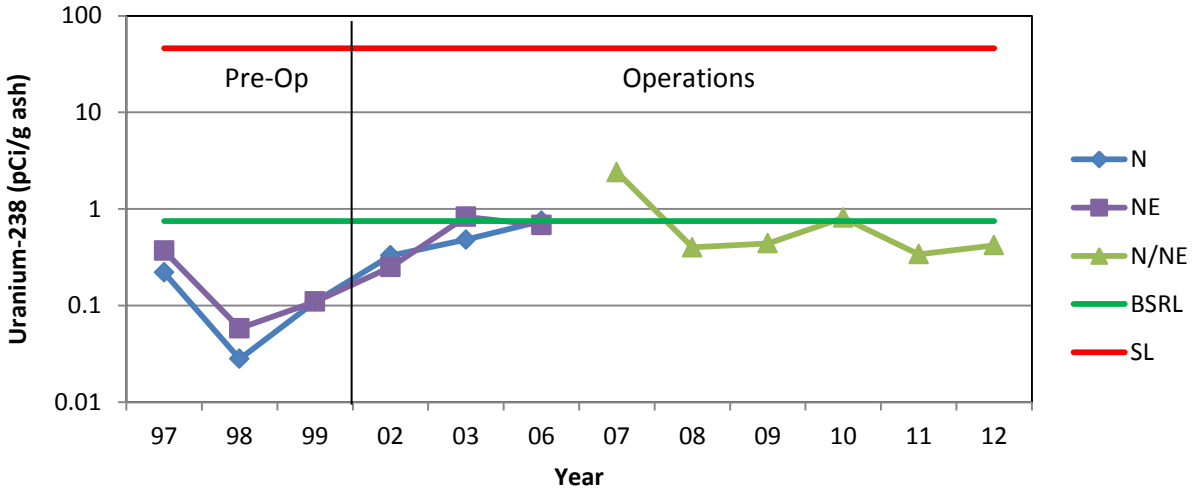

Figure 3-5. Uranium-238 concentrations in (whole-body) mice collected from the north (N), northeast (NE), and north-northeast (N/NE) side of the DARHT facility at TA-15 from 1997–1999 (preoperations) through 2002–2012 (during operations) compared with the BSRL and the SL. Note the logarithmic scale on the vertical axis.

Most TAL elements, with the exception of a few elements, in a field mouse sample collected from the northeastern perimeter of the DARHT facility were either not detected or similar to RSRLs (based on 2007–2009 data; n = 9) (Fresquez 2011). The amounts of barium and lead detected in a mouse sample were an order of magnitude higher than the RSRL, but the amounts in soil from the north-side perimeter of DARHT for barium (115 mg/kg) and lead (10 mg/kg)

were far below the ESLs (<1800 mg/kg and 120 mg/kg, respectively) for the deer mouse and not a concern (LANL 2012).

Most dioxin or furan chemicals in a field mouse sample were not detected above the method detection limit (MDL); only an estimated trace amount (above the MDL but below the detection limit) of 1,2,3,4,6,7,8-heptachlorodibenzodioxin was listed, but the level was below the RSRL (based on 2011 data; n = 8) (Fresquez 2011) (Table S8-9). Trace amounts of 1,2,3,4,6,7,8-heptachlorodibenzodioxin in soil near the firing point were also detected above the MDL.

Bee Monitoring. All radionuclide concentrations in two honey bee samples collected from hives located on the northeastern perimeter of the DARHT facility were either not detectable (most results) or below the BSRLs.

A comparison of uranium-238 in bee samples over the preoperational and operational period at DARHT reveals the same general trend observed with the other biotic samples; that there is an increase in activity to around 2006 and then a sharp decrease concurrent with the change in detonation mitigation practices from open-air/foam (2000–2006) to closed vessel containment starting in 2007 (Figure 3-6).

About 50% of the TAL elements in bee samples collected from hives northeast of the DARHT facility were higher than the RSRLs (based on 2010 data; n = 3). Most of these TAL elements, however, were within the same order of magnitude as the RSRLs and are probably a reflection of the low number of background samples used to calculate an RSRL.

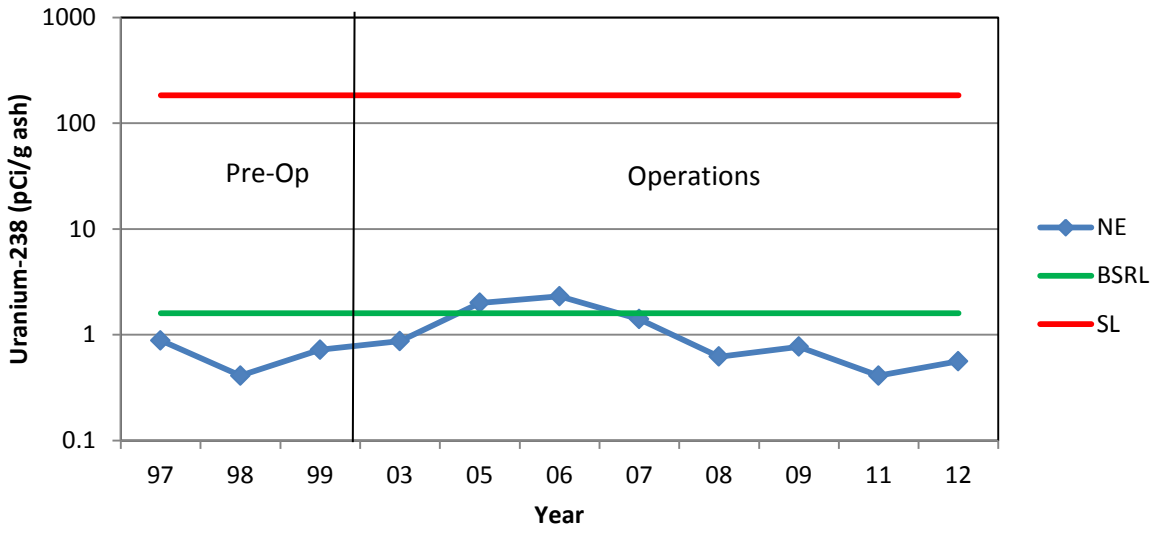

Figure 3-6. Uranium-238 concentrations in bees collected from the northeast (NE) side of the DARHT facility at TA-15 from 1997–1999 (pre-operations) through 2003–2012 (during operations) compared with the BSRL and the SL. Note the logarithmic scale on the vertical axis.

Bird Monitoring. Birds were collected for population, composition, and diversity estimates using 12 mist capture net traps spaced about 200 ft to 1,600 ft outward from the west side of the DARHT facility. The objective of the bird monitoring project is to determine the general

(ecological) stress levels around the vicinity of DARHT caused by facility operations (e.g., noise, disturbance, traffic).

The number of bird species and the diversity and evenness (distribution) of birds collected in 2012 is slightly higher than those collected before the start-up of operations at DARHT (Figure 3-7). On the other hand, the number of birds in 2012 was the lowest since counts began—this was a result of one fewer netting sessions (9 out of 10 days) because of DARHT access restrictions—and the types of birds collected at DARHT have changed since the late 1990s/early 2000s. The site has gradually changed from a ponderosa pine– (*Pinus ponderosa*–) dominated plant community to a more piñon/juniper (*Pinus edulis*/*Juniperus monosperma*) habitat, possibly because of fire and bark beetle activity that has killed almost all of the ponderosa pines in the project area.

The birds that were the most common during the preoperation period/early years of operation included the chipping sparrow (*Spizella passerina*), Virginia's warbler (*Vermivora virginiae*), western tanager (*Piranga ludoviciana*), and the western bluebird (*Sialia mexicana*). This year, the most common birds included the common bushtit (*Psaltriparus minimus*), Virginia's warbler, and the rock wren (*Salpinctes obsoletus*). Also, the downey woodpecker (*Picoides pubescens*) and the western kingbird (*Tyrannus verticalis*) were captured for the first time since the study began.

The Virginia's warbler is listed in the top 100 birds at risk in North America in the Birder's Conservation Handbook (Wells 2007) and is a common inhabitant of the ecosystem near the DARHT facility

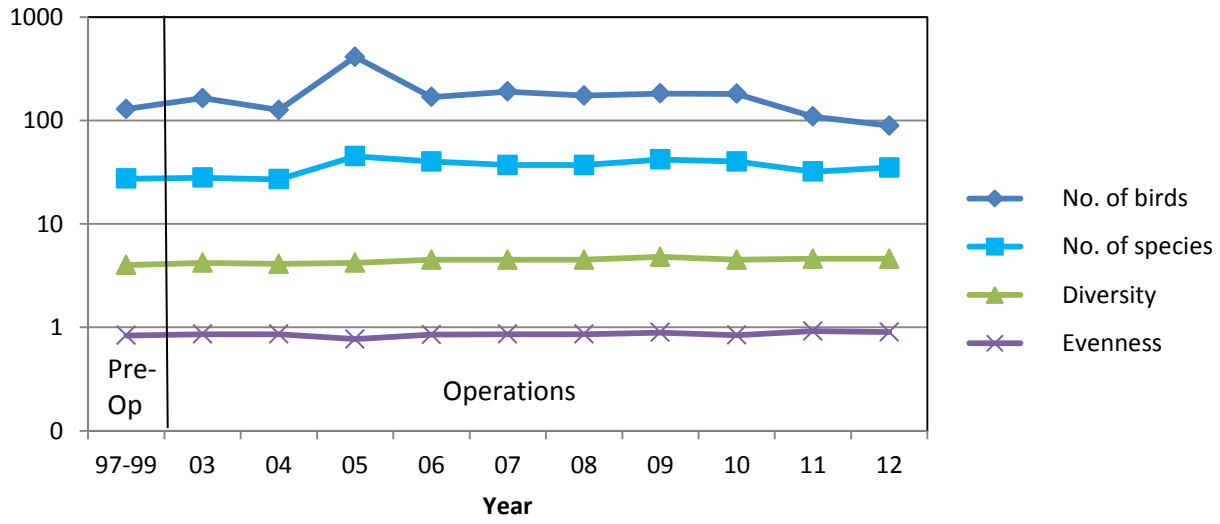

Figure 3-7. Populations, number of species, diversity, and evenness of birds occurring before (1997–1999) and during (2003–2012) operations at DARHT. Note the logarithmic scale on the vertical axis.

MAP Section VIII.A.1(c)

For routine DARHT facility operations, the sampling and analysis methodology used in the environmental baseline monitoring conducted under Section VIII.A.1(b) (see above) was

designed to include environmental monitoring requirements under this mitigation action. Should the DARHT facility experience a substantial accidental spill or release of hazardous or radioactive materials, additional environmental monitoring would be conducted under this mitigation action as necessary. On January 18, 2005, approximately 385 gallons of mineral oil was released from an aboveground storage tank into the secondary containment system during an oil transfer—this released material did not reach the environment.

MAP Section VIII.A.1(d)

In accordance with the ROD for the DARHT Final EIS, DOE was operating the DARHT facility while implementing a program to conduct tests inside single-walled steel containment vessels with containment (Note: current DARHT nomenclature is confinement) to be phased in over 10 yr (the Phased Containment option of the Enhanced Containment alternative) (DOE 1995). In general, open-air detonations occurred from 2000–2006 and detonations within a foam medium occurred from 2002–2006. A containment vessel qualification shot was conducted at the TA-39 Firing Point 6 in 2006, and shots within single-walled steel containment vessels at DARHT were implemented in May of 2007. Three hydrodynamic test shots within single-walled steel containment vessels at DARHT were conducted in 2007. Two hydrodynamic test shots were conducted within single-walled steel containment vessels at DARHT in 2008. These steel containment vessels achieved at least a 40% reduction in material released to the open air as prescribed for Phase II of the Phased Containment option.

Measurements using a variety of sampling methodologies (e.g., air particulates, adhesive films, surface swipes, and video analysis) at the firing point and sites downwind (mostly) of the firing point at various distances (50, 135, and 200 m) during open-air and foam detonations showed that use of foam reduced the size of a plume generated from a hydrodynamic test and the dispersal of contaminants by an average of 80% (Duran 2008); this is far above the 5% reduction prescribed for Phase I of the Phased Containment option.

Similarly, potential contaminant releases during foam mitigation and the use of steel containment vessels were compared using surface swipes, particulate air sampling, and monitoring of detonation gases at the vessel and around the immediate work area. The use of steel containment vessels shows an additional 20% reduction over foam mitigation in potential emissions of uranium and beryllium as a result of a shot. In other words, the use of steel containment vessels reduced the amount of potential contamination by 99.9% and was far above the 40% reduction in material released to the open air as prescribed for Phase II of the Phased Containment option.

MAP Section VIII.A.1(e)

The VPB located at TA-15 near the DARHT facility underwent a Phase II readiness review in FY 2006 and the facility was approved to begin operations including the staging, preparation, and decontamination of containment vessels. The containment vessel qualification shot conducted in 2006 provided baseline data/characterization of vessel debris resulting from hydrodynamic testing and analysis of the generated gas byproducts to aid in the disposal of future material, to provide data for personnel safety, and to aid in the development of future cleanout procedures for the containment vessels.

Containment vessel decontamination operations began in FY 2007; during FY 2008 containment vessels continued to be decontaminated on the DARHT firing point. Following decontamination, the vessels were transported to the VPB and prepared for the next experiment.

Summary of Potential Impacts

MAP Section VIII.A.2

The DARHT MAP identifies the potential for contamination of the environment with various types of waste as a result of cleaning out the containment vessels.

Mitigation Action Scope

The cleaning operations will recycle materials as much as reasonably possible and use appropriate operations processes to limit discharges of waste to the environment. Waste minimization techniques will be applied to those materials that cannot be recycled and they will be disposed of in permitted disposal facilities.

Status

MAP Section VIII.A.2

LANL has completed construction of a permanent VPB to be operated at TA-15 near the DARHT facility. This facility is approved to stage, prepare, and decontaminate, as appropriate, the vessels used in the DARHT hydrodynamic experiments. LANL has developed containment vessel cleanout processes in support of the commitment to decontaminate vessels used in experiments.

Process equipment for managing debris from vessel shots has been installed in the VPB. Procedures for vessel cleanout, decontamination, and stabilization of debris from vessel shots have been prepared to support containment vessel experiments. Waste minimization techniques are applied during the vessel cleanout and decontamination processes. Typically, nonrecyclable materials are placed into 55-gallon drums, fixed with cement, and disposed of at TA-54, Area G (Zumbro 2010).

Summary of Potential Impacts

MAP Section VIII.A.3

The DARHT MAP identifies the potential for contamination of the environment with various types of hazardous material as a result of spills within the DARHT facility.

Mitigation Action Scope

Spill containment (physical barriers or sills) within the DARHT facility will be provided by engineering design to contain all hazardous material spills that could occur. Additionally, a spill prevention control and countermeasures plan will be required before facility operation begins and will be maintained for the life of the facility. Also, a spill response/emergency response team and/or equipment will be available, which can be deployed in the event of an accident.

Status

MAP Section VIII.A.3

Spill containment (physical barriers or sills) within the DARHT facility is in place and is maintained to contain all hazardous material spills that could occur. A spill prevention control and countermeasures plan was completed and approved before DARHT facility operations began. This plan will be maintained for the life of the facility consistent with the requirements under the LANL Integrated Safety Management (ISM) System and Environmental Protection Agency Oil Pollution Prevention Regulation, 40 CFR Part 112. The DARHT facility has not had

a substantial accidental spill of hazardous materials. Should an accidental spill occur in the DARHT facility, appropriate emergency actions will be taken in accordance with existing operational procedures. These emergency actions would include deployment of the LANL Hazardous Materials Response Team (HAZMAT). The HAZMAT is on call full-time to respond to all emergency spills within the LANL site and, as needed, the LANL region. The mineral oil release was not considered a spill because it did not reach the environment and did not require HAZMAT deployment.

Summary of Potential Impacts

MAP Section VIII.A.4

The DARHT MAP identifies the potential for contamination of the environment with hazardous levels of various substances as a result of discharges of industrial water from the DARHT facility cooling tower.

Mitigation Action Scope

Water discharged from the DARHT facility cooling tower will be monitored to ensure compliance with outfall permits as stated in the National Pollutant Discharge Elimination System (NPDES) permit for the DARHT facility site. Should discharge levels exceed permit limits, LANL's Water Quality and RCRA (Resource Conversation and Recovery Act) Group (ENV-RCRA) will act to bring the facility into compliance.

Status

MAP Section VIII.A.4

Water flow from the DARHT facility cooling tower is routinely monitored by ENV-RCRA to ensure compliance with the NPDES permit. There was an NPDES chlorine exceedance at the DARHT cooling tower (Outfall 03A185) in FY 2006. The compliance sample result of >2.2 mg/L exceeded the daily maximum permit requirement of 500 μg/L (0.5 mg/L). Corrective actions were taken to get the discharge back into compliance. Since 2010, the cooling tower discharges have been tied into the LANL sanitary wastewater treatment plant at TA-46. Consequently, Outfall 03A185 was removed from LANL's NPDES permit on October 10, 2012.

3.2 Mitigation Actions for Soil

Summary of Potential Impacts

MAP Section VIII.B.1(a–c), 2(a–e)

According to the DARHT MAP, loss of soil and vegetation could occur during construction and operation of the DARHT facility as a result of severe storms and consequent severe stormwater runoff. In addition, off-road and groundbreaking activities caused by additional construction and operational activities may result in further soil erosion and damage to plants.

Mitigation Action Scope

MAP Section VIII.B.1(a–c)

The operational mitigation actions associated with these potential impacts are as follows:

a) Adherence to all soil erosion mitigation measures in accordance with the operational Stormwater Pollution Prevention Plan (SWPPP) to ensure that erosion and sedimentation are minimized and that drainage facilities are in place to control runoff. These measures

will include temporary and permanent erosion control, sedimentation control, surface restoration and revegetation, stormwater attenuation in paved and unpaved areas, routine inspection, and best management practices, which include minimization of fuel and oil spills, good housekeeping practices, and control of stored material and soil stockpiles.

b) Modification of SWPPP if control measures are ineffective.

c) Establishment and continuance of erosion/sediment control best management practices. The best management practices required by the SWPPP shall be continually monitored and maintained.

Status

MAP Section VIII.B.1(a)

The DARHT facility operations are conducted in full compliance with an existing SWPPP. The SWPPP has been implemented to ensure that erosion and sedimentation are minimized and measures are in place to control runoff. The plan includes required measures for temporary and permanent erosion control, sedimentation control, surface restoration and revegetation, stormwater attenuation in paved and unpaved areas, routine inspection, and a best management practices plan, which includes minimization of fuel and oil spills, good housekeeping practices, and control of stored material and soil stockpiles. The scope, implementation, and modification of the operational SWPPP are routinely reviewed by Weapons Facilities Operations, Facilities Operations Directorate (WFO-FOD) environmental personnel and ENV-RCRA.

MAP Section VIII.B.1(b)

If control measures prescribed in the SWPPP are determined to be ineffective, the scope and implementation of the operational SWPPP will be modified, as necessary, by WFO-FOD environmental personnel and ENV-RCRA.

MAP Section VIII.B.1(c)

Best management practices prescribed in the SWPPP are continually monitored and maintained by DARHT facility representatives and WFO-FOD environmental personnel. Current control measures have proven appropriate and effective. If control measures are determined to be ineffective, the scope and implementation of the SWPPP are modified, as necessary, by the WFO-FOD environmental personnel and ENV-RCRA.

Mitigation Action Scope

MAP Section VIII.B.2(a–e)

The operations mitigation actions associated with these potential impacts are as follows:

a) Workers must avoid off-road activities and stay within approved rights-of-way.

b) Any proposed activities requiring the disturbance of mature trees and shrubs must first be approved by ENV-ES to avoid disturbance to threatened and endangered species and other wildlife species.

c) ENV-ES must be notified before any new groundbreaking activities. ENV-ES will review all new sites and evaluate any potential impacts associated with the action. ENV-ES will also provide mitigation to minimize potential impacts, including revegetation as addressed in the SWPPP.

d) The size of a vegetation buffer zone between the facilities and the edge of the mesa tops will be determined by ENV-ES based on topographic aspects and vegetation composition.

e) Indigenous trees and/or other indigenous vegetation will be planted, as appropriate, for erosion control, landscaping, and additional wildlife habitat.

Status

MAP Section VIII.B.2(a)

DARHT facility operations are conducted according to procedures that, in part, restrict facility workers to designated areas. Access to undesignated areas of the DARHT facility site is managed according to procedures that restrict access to authorized personnel on special work assignments such as postshot material recovery or fire-suppression operations. All other workers avoid off-road activities and stay within approved rights-of-way.

MAP Section VIII.B.2(b–e)

Under the ISM System at LANL, all planning, construction, and operations activities must comply with the institutional process established under LANL Implementation Procedure 405.0 (P405.0)—also known as the NEPA, Cultural, and Biological (NCB) Review. (Note: These activities previously were governed by Laboratory Implementation Requirement 404-30.02.0.) This implementation procedure establishes the institutional requirements to ensure that contractual work-smart standards for NEPA, cultural resources, and biological resources are consistently met. In addition to requiring full compliance with applicable NEPA, cultural resources, and biological resources Federal regulations, P405.0 requires full and effective implementation of the LANL HMP (LANL 2011). These standards are measured by performance criteria contained in the Laboratory Performance Requirement 404-00-00 Appendix 3 (Environmental Protection—Ecological and Cultural Resources). ENV-ES is the Office of Institutional Coordination for P405.0 and is responsible for developing, revising, and maintaining the document, as well as technically assisting in its full and effective implementation.

Under the institutional Wildland Fire Management Plan (LANL 2007-update for 2012) and wildfire risk reduction program, some of the forested areas surrounding the DARHT facility site have been thinned. The forest thinning was determined to be necessary to minimize the immediate risk of a wildfire starting in the overgrown forest that originally surrounded the DARHT facility site. The specific location and amount of thinning was planned and implemented in full compliance with P405.0. Additional thinning was conducted along the exclusion fence to eliminate dead, hazardous trees that might damage the fence. The DARHT facility site forest-thinning activities were conducted in consultation with the Ecology Group (now ENV-ES) to ensure appropriate protection of Mexican spotted owl and other wildlife habitat in the area (such as vegetation buffer zones and erosion control). All applicable NEPA, biological resources, and cultural resources regulatory requirements—including MAP Section VIII.B.2(b–e)—for DARHT facility operations and other facility management activities around the DARHT facility site are fully addressed through the ongoing implementation of P405.0.

3.3 Mitigation Actions for Biotic Resources

Summary of Potential Impacts

MAP Section VIII.C.1(b–d); 2(n–x); 3(a, b); 4(a–c); 5(a); 6(a); 7(a, b); 8(a, b); 9(a, b); and 10(a, b)

According to the DARHT MAP, DARHT facility construction and operation could impact federally protected threatened and endangered species such as the Mexican Spotted Owl because of noise from firings and other operations, as well as other activities at the firing site. These activities could impact other sensitive species potentially residing in or traversing the project area as well. If present, the following species could be affected: American peregrine falcon, northern goshawk, bald eagle, spotted bat, Townsend's pale big-eared bat, New Mexico meadow jumping mouse, Jemez Mountains salamander, and the wood lily.

Mitigation Action Scope

MAP Section VIII.C.1(b–d); 2(n–x); 3(a, b); 4(a–c); 5(a); 6(a); 7(a, b); 8(a, b); 9(a, b); and 10(a, b)

These sections of the DARHT MAP commit DOE and LANL to implementing mitigation measures selected to protect threatened, endangered, and sensitive species in the DARHT facility area. These mitigation measures collectively require DARHT facility representatives to continue to coordinate with ENV-ES on all DARHT facility site threatened and endangered species issues through the ongoing implementation of the LANL HMP. LANL will conduct the necessary species monitoring and habitat protection measures required for the DARHT facility site through the HMP (LANL 2011).

Status

MAP Section VIII.C.1(b–d); 2(n–x); 3(a, b); 4(a–c); 5(a); 6(a); 7(a, b); 8(a, b); 9(a, b); and 10(a, b)

Since January 1999, LANL has fully implemented the HMP. During FY 2000, sitewide implementation of the HMP was included as part of the institutional requirements in P405.0. All applicable NEPA, biological resources, and cultural resources regulatory requirements (including MAP Section VIII.C.1 [b–d]; 2 [n–x]; 3 [a, b]; 4 [a–c]; 5 [a]; 6 [a]; and 7 [a, b]) for DARHT facility operations are addressed through the ongoing implementation of P405.0. The HMP was updated in FY 2012.

3.4 Mitigation Actions for Cultural Resources

Summary of Potential Impacts

MAP Section VIII.D.1(b, e–g)

The DARHT MAP identifies potential impacts from blast effects, such as shock waves and flying debris, from shots using high-explosive charges. These blast effects could affect nearby archaeological sites, especially Nake'muu, and the immediate surrounding environment.

Mitigation Action Scope

MAP Section VIII.D.1(b, e–g)

The operations mitigation actions associated with these potential impacts are as follows:

b) For large, high-explosive-charge experiments, a temporary expendable fragment mitigation, consisting of glass plates (to dissipate energy), a sand bag revetment, or other shielding material, will be constructed as necessary on a case-by-case basis to mitigate blast effects.

e) A long-term monitoring program will be implemented at Nake'muu using photographs or other means of recording to determine if activities at TA-15 are causing any structural changes to the cultural site over time.

f) DOE will periodically arrange for tribal officials to visit cultural resource sites within TA-15 that are of particular interest to the tribes (at least once a year).

g) The DARHT facility operator will periodically pick up metal fragments in the areas where fragments land and will invite local tribes to participate (at least once a year) so that tribal representatives can observe whether there has been damage to any cultural resource sites. DOE will evaluate procedures/measures for mitigation periodically. If damage is discovered, necessary changes will be implemented and reported in the MAPAR. Such changes will be implemented in consultation with the four Accord Pueblos (Cochiti, Jemez, Santa Clara, and San Ildefonso).

Status

MAP Section VIII.D.1(b)

In general, open-air detonations occurred from 2000–2006 and detonations within a foam medium and steel containment vessels occurred from 2002–2006 and from 2007–2008, respectively. None of the large explosive shots in 2002 or 2003 (two shots each year) required fragment mitigation for blast effects, and the employment of foam and steel containment vessels in the latter years significantly reduced the size of a plume and the dispersal of materials (Duran 2008).

Thus, with regard to fragment mitigation measures, all future shots will be evaluated on a case-by-case basis to determine the need for additional fragment protection; however, the current use of steel containment vessels basically eliminates this mitigation concern.

MAP Section VIII.D.1(e)

The results of the 9-yr-long annual assessment of physical conditions at Nake'muu (1998–2006) led to the conclusion that the natural environment, in particular the amount of yearly snowfall and elk moving through the site, is responsible for the deterioration of the standing wall architecture, not the operations at DARHT (Vierra and Schmidt 2006). As a result of this statistically quantitative study, additional annual monitoring at Nake'muu under the DARHT MAP was determined to not be required and was suspended in FY 2007. Note that yearly qualitative assessments of Nake'muu have also been performed as part of the MAP for the Special Environmental Analysis (SEA) associated with the Cerro Grande fire (DOE 2000a). These field checks, conducted by the LANL Resources Management Team (RMT), include brief assessments of the standing walls at Nake'muu along with checks of the associated fire road and firebreak. During the period of FY 2006–2009 the Nake'muu field checks were directly tied into the annual visit by the Pueblo de San Ildefonso required by the DARHT MAP, which provided Pueblo de San Ildefonso visitors for the DARHT tour with the opportunity to witness and discuss conditions at this ancestral pueblo.

Due to the Las Conchas Fire, June 2011, no field assessment visit was conducted to Nake'muu and therefore no detailed photography was conducted during fiscal year 2011. On June 7 and 15, 2012, RMT members conducted shrub removal and photographic documentation in order to perform the annual condition assessment of the walls. Erosion of the mortar throughout the site was noted since the last assessment (October 2010). Chinking stones are more exposed between the tuff blocks. Through comparison of the photographs from 2010 and 2012, it was documented that three stones form the top of walls have fallen.

MAP Section VIII.D.1(f)

Representatives from San Ildefonso visited Nake'muu with members of the RMT on November 10, 2010 (FY 2011). Several attempts for tours, during fiscal year 2012, of Nake'muu for the Pueblo de San Ildefonso were scheduled and canceled because members of San Ildefonso Pueblo were unable to attend.

MAP Section VIII.D.1(g)

Fragment mitigation measures are implemented for experiments that have the potential to generate fragments. Mitigation measures for material releases to the environment include steel containment vessels, implemented in FY 2007, and before FY 2007, aqueous foam. The postshot operations for the experiments were conducted according to experiment-specific integrated work documents and the following established standard procedures:

- WFO-OS-ES-050 General Safety for Firing Site Areas
- WFO-OS-ES-030 General Firing Operations
- HX-DARHT-TP-1039 DARHT Firing Operations
- HX-DARHT-TP-1040 General Explosive Operations at DARHT
- DX-PRO-012 Division Waste Management Procedure
- WFO-OS-HS-025 Radiological Controls

These procedures have been determined appropriate by DOE and are implemented under the LANL ISM System as an integral part of DARHT facility operations and provide the operational basis and procedures for recovery of metal fragments dispersed during operational shots. In addition to the ISM System requirements, these procedures appropriately address DARHT MAP commitments that are designed to minimize the short- and long-term release of contaminants (radioactive and hazardous materials) to the DARHT facility site.

Summary of Potential Impacts

MAP Section VIII.D.2(a, b)

The DARHT MAP identifies the potential for structural or other damage to as-yet-unknown Native American cultural resources within the area of potential effects for the DARHT facility site. Such damage could occur as a result of DOE's lack of knowledge of these resources in the DARHT facility area.

Mitigation Action Scope

MAP Section VIII.D.2(a, b)

The operational mitigation actions associated with this potential impact are as follows:

a) Consultation with the four Accord Pueblos will continue to identify and protect any such cultural resources throughout the life of activities at the DARHT facility.

b) Evaluation of cultural resources in the vicinity of TA-15 will also be coordinated with the New Mexico State Historic Preservation Officer (SHPO), as appropriate, for concurrence of eligibility determinations and potential effects.

Status

MAP Section VIII.D.2(a, b)

DOE and the Ecology Group completed the Phase II cultural resources assessment and cultural resources report for the DARHT facility project. On May 20, 1999, the SHPO officially concurred with a DOE and LANL finding that the construction and operation of the DARHT facility will have "no adverse effect" on cultural resources in the potentially affected area (DOE 1999b). In addition, as part of the LANL SWEIS MAP, in FY 2000 LANL completed the "Comprehensive Plan for the Consideration of Traditional Cultural Properties and Sacred Sites at Los Alamos National Laboratory" (DOE 2000b). This DOE plan was approved in August 2000 and provides the institutional framework for identifying and documenting two specific types of cultural resources: traditional cultural properties (TCPs) and sacred sites (DOE 2000b). As part of DARHT facility operations, DOE and LANL will continue to consult with the four Accord Pueblos through annual tours, as necessary, to minimize the potential for structural or other damage to as-yet-unknown Native American cultural resources within the area of potential effects for the DARHT facility site. Cultural resource surveys conducted as part of the Cerro Grande Rehabilitation Project did not identify any new archaeological sites in the vicinity of the DARHT facility. No new TCP or sacred site issues were identified during FY 2007 through 2010. Any future TCP and sacred site issues will be addressed as part of the institutional process established under the "Comprehensive Plan for the Consideration of Traditional Cultural Properties and Sacred Sites at Los Alamos National Laboratory" (DOE 2000b).

In the future,(beginning in FY 2012), the annual visit of the Pueblo de San Ildefonso to Nake'muu and the associated rehabilitation monitoring and site condition assessment under the SEA MAP will become part of the annual implementation of the Cultural Resources Management Plan (LANL 2006), which is currently being revised and updated.

3.5 Mitigation Actions for Human Health and Safety

Summary of Potential Impacts

MAP Section VIII.E.1(a)

The DARHT MAP identifies potential adverse health effects on workers and the general public from high noise levels associated with the DARHT facility, especially from construction and test firing.

Mitigation Action Scope

MAP Section VIII.E.1(a)

Under this section of the DARHT MAP there is a commitment to provide noise protection to workers in the form of ear muffs or ear plugs, depending on the expected noise levels, per Occupational Safety and Health Administration Act of 1972 requirements.

Status

MAP Section VIII.E.1(a)

Under the institutional implementation of the ISM System, DARHT facility operations are managed according to specific procedures that collectively address a wide range of potential impacts to worker safety and health. These procedures fully address potential adverse health effects on workers from high noise levels associated with the DARHT facility during test firing by requiring the use of appropriate personal protective equipment.

Summary of Potential Impacts

MAP Section VIII.E.2(a–c)

The DARHT MAP identifies the potential for adverse health effects on workers from radiation from DARHT facility operations.

Mitigation Action Scope

MAP Section VIII.E.2(a–c)

The operations mitigation actions associated with this potential impact are as follows:

a) Radiation shielding will be provided around the accelerators to limit radiation exposure to workers in the facility.

b) DARHT facility workers will be required to complete DOE-certified core radiological training (minimum Rad-Worker I level) and be enrolled in the LANL dosimetry program.

c) Engineered controls will be installed as visual indicators to notify workers when the accelerators are operating.

Status

MAP Section VIII.E.2(a–c)

Under the institutional implementation of the ISM System, DARHT facility operations are managed according to specific procedures that collectively address a wide range of potential impacts to worker safety and health. DARHT facility accelerator operations are conducted in accordance with the DARHT Operations Standard HX-DARHT-AP-014. This procedure requires appropriate training, radiation dosimetry program participation, and acceleration operations that collectively protect workers from exposure to unacceptable levels of radiation.

4.0 CONCLUSIONS

In FY 2012 there were no significant impacts from contaminants based on measurements of soil, sediment, vegetation, field mice, and bees from DARHT operations. Also, the comparison of bird species diversity and composition, a qualitative measurement, before and during DARHT operations, showed no significant impacts to the bird populations.

Although 2012 contaminant levels were not at concentrations detrimental to human health or to the environment, there were still measurable amounts of depleted uranium in all media, and the levels were increasing over time to at least 2006. Concentrations of depleted uranium in most media decreased in 2007 and may correspond to the success of employing steel containment vessels and/or to a reduction of detonations. However, since increases of uranium in all media were noted until at least 2006 and uranium may linger in soils for some time, the monitoring of

all or part of these media should be continued to a point where the concentrations are similar to BSRLs.

Foam mitigation significantly reduced the amount of potential contaminants released into the environment compared with open-air detonations, and the use of steel containment vessels further reduced those amounts over foam mitigation.

Regarding potential impacts from DARHT operations on Nake'muu, the natural environment is having a greater effect on the deterioration of the standing wall architecture than the operations at DARHT.

4.1 2012 MAP Implementation

In July 1999, all construction-related DARHT MAP mitigation commitments and action plans were completed. The FY 2012 DARHT MAP activities represent the twelfth year of operation implementation. The DARHT MAP activities implemented during FY 2012 were a continuation of DARHT facility operations-phase MAP tracking and annual reporting. Should the scope of the DARHT facility project change during the operations stage, as part of the appropriate NEPA review, the scope of the DARHT MAP could be changed by NNSA as necessary and as directed by DOE LASO.

4.2 Recommendations

- **Continue monitoring for contaminants that are above BSRLs or are on increasing trends.** Future (2012) DARHT operations will likely incorporate more contained tests. As a result, impacts from a given year of DARHT operations on the environment should eventually decrease and this decreasing trend should be considered in future monitoring decisions. However, uranium-238 appears to have accumulated in soils and sediments, particularly near the firing point, and may impact biotic resources over a period of years. These potential cumulative impacts should continue to be monitored, especially for contaminants such as uranium-238 that are above BSRLs or are on increasing trends.
- **Reevaluate environmental monitoring strategy**. The environmental monitoring strategy for DARHT should be reevaluated with consideration of issues such as (1) budget, (2) movement to contained shots in 2007, (3) trend in contaminant concentrations and comparison with the benchmark thresholds of BSRLs (RSRLs) and SLs, and (4) the results of the 2005 special study on the effects of discontinuity in sample data.
- **Continue to issue the DARHT MAPAR annually.** The DARHT MAPAR will continue to be issued annually as part of the SWEIS MAPAR. Detailed analysis of DARHT monitoring data and results will continue to be published in the annual ER.
- **Continue environmental rehabilitation activities and annual tribal visits at Nake'muu.** Annual monitoring at Nake'muu has been discontinued, but site visits every 2 to 3 yr for vegetation removal, etc., and annual tribal visits should continue. Future TCP and sacred site issues should be addressed as part of the institutional process established under the "Comprehensive Plan for the Consideration of Traditional Cultural Properties and Sacred Sites at LANL" (DOE 2000b).
- **Continue to manage DARHT facility operations in accordance with ISM.** Under the institutional implementation of the ISM System, continue to manage DARHT facility

operations according to specific procedures that collectively address a wide range of potential impacts to worker safety and health including, but not limited to, noise and radiation hazards.

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Appendix III

FISCAL YEAR 2013 TRAILS MANAGEMENT PROGRAM MITIGATION ACTION PLAN ANNUAL REPORT

Los Alamos National Laboratory
Los Alamos, New Mexico

Prepared by Daniel S. Pava, Environmental Stewardship Group (ENV-ES)
For the Department of Energy, National Nuclear Security Administration,
Los Alamos Field Office

Title: FISCAL YEAR 2013 TRAILS MANAGEMENT PROGRAM MITIGATION ACTION PLAN ANNUAL REPORT

Preparers: Daniel S. Pava, Environmental Protection Division, Environmental Stewardship Services Group (ENV-ES)

New kiosks and gates at the Potrillo Canyon Trailhead, installed during summer 2013

Los Alamos NATIONAL LABORATORY EST.1943

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Contents

ACRONYM LIST

CFR	Code of Federal Regulations
DOE	Department of Energy
EA	environmental assessment
FONSI	Finding of No Significant Impact
FY	Fiscal Year
LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security, LLC
MAP	Mitigation Action Plan
MAPAR	Mitigation Action Plan Annual Report
NMED	New Mexico Environment Department
NNSA	National Nuclear Security Administration
NPS	National Park Service
SWEIS	Site-Wide Environmental Impact Statement
TA	Technical Area
TWG	Trails Working Group
USFS	US Forest Service
VTF	Volunteer Task Force

1.0 EXECUTIVE SUMMARY

This Trails Management Program Mitigation Action Plan Annual Report (Trails MAPAR) has been prepared for the Department of Energy (DOE)/National Nuclear Security Administration (NNSA) as part of implementing the 2003 *Final Environmental Assessment for the Proposed Los Alamos National Laboratory Trails Management Program* (DOE 2003). The Trails Mitigation Action Plan (MAP) is now a part of the *Site-Wide Environmental Impact Statement for the Continued Operation of Los Alamos National Laboratory (DOE/EIS 0380) Mitigation Action Plan* (2008 SWEIS MAP) (DOE 2008). The MAP provides guidance for the continued implementation of the Trails Management Program at Los Alamos National Laboratory (LANL) and integration of future mitigation actions into the 2008 SWEIS MAP to decrease impacts associated with recreational trails use at LANL.

This eighth MAPAR includes a summary of Trails Management Program activities and actions during Fiscal Year (FY) 2013, from October 2012 through September 2013.

2.0 CONTEXT: TRAILS AT LANL

Recreational trails use at LANL has been considered one of the benefits of working and living in Los Alamos County. However, there was never an explicit DOE/NNSA or Los Alamos National Security, LLC (LANS) policy or mechanism to balance trails use on LANL property with environmental, cultural, safety, security, and operational concerns. In 2003, the DOE directed LANL to establish such a program. DOE/NNSA published the *Final Environmental Assessment for the Proposed Los Alamos National Laboratory Trails Management Program* and a Finding of No Significant Impact (FONSI) (DOE 2003) in September 2003. The DOE/NNSA issued a MAP for this environmental assessment (EA) on the same date. The most pertinent trails issues identified during the scoping of the EA were:

- DOE/NNSA does not have a public recreational mission established by Congress.
- The public gets conflicting messages regarding trails on LANL property because signs, access controls, and enforcement at LANL vary.
- Trespassing occasionally occurs from LANL onto adjacent lands where trail use is not permitted.
- Trail use poses threats to some cultural and natural resources.
- Trail use in certain LANL areas increases the risks of human exposure at potential release sites, and other operational and natural hazards including wildfires.
- Security concerns are posed by the use of certain LANL trails.

The MAP established the Trails Management Program, which would be implemented through individual projects, including measures for planning, repair and construction, environmental protection, safety, security, and post-repair and construction end-state conditions assessments. A standing Trails Working Group made up of LANL and other agency's stakeholders was formed to carry out this program.

The goals of the trails management program are:

Reduce the risk of damage and injury to property, human life, and health, and sensitive natural and cultural resources from social trail use at LANL.

Facilitate the establishment of a safe, viable network of linked trails across the Pajarito Plateau that traverse land holdings of various private and government entities for recreational use and for alternate transportation purposes without posing a threat to DOE and NNSA mission support work at LANL or disrupting LANL operations.

Maintain the security of LANL operations.

Respect the wishes of local Pueblos to maintain access to traditional cultural properties by Pueblo members while also preventing unauthorized public access to adjacent Pueblo lands and other lands identified as both religious and culturally sensitive areas to Native American communities.

Adapt trail use at LANL to changing conditions and situations in a responsive manner.

Maintain the recreational functionality of the DOE lands so that the land owned by the DOE remains open to all members of the public for non-motorized recreation, in compliance with federal laws and LANL operational constraints.

3.0 TRAILS MANAGEMENT PROGRAM

The Trails Working Group met eleven times in FY 2013. The Trails Working Group held its 91st meeting in September 2013. Typically, Trails Working Group attendees include subject-matter experts from LANL, representatives from Los Alamos County, nearby Pueblos, Bandelier National Monument, the Santa Fe National Forest, and interested local residents. Meetings provide an ongoing and in-depth forum for discussing and resolving trails mitigation issues that arise from active adaptive management. What follows are the highlights of the FY 2013 Trails Management Plan implementation at LANL.

3.1 Fixing and Protecting Trails

Trail repair and protection focused primarily on the 4,000-acre tracts located between White Rock and Bandelier National Monument, known as Technical Areas (TAs) 70 and 71. This buffer area is easily accessed from Pajarito Acres and State Road 4, and been used by the public for decades. LANS cultural resources staff and Bandelier patrols have observed problems in TA-70 and 71, and attempts to close trail segments were being challenged and impeded by users. In FY 2013 the Trails Management Program instituted a concerted effort to formally make the necessary changes recommended in previous studies of the area. Pursuant to an agreement with the DOE, National Park Service (NPS) rangers now have patrol and police enforcement authority under 36 Code of Federal Regulations (CFR). A mutual goal this past FY was to upgrade and standardize trailhead portals, signs, and general appearances in this area in order to better communicate privileges and responsibilities of trails users. The desired outcome of this effort is to implement a proper balance between LANL's federal stewardship requirements for protecting its natural and cultural resources with a long-standing popular trails access policy in TA-70 and 71. In March, LANS and DOE made the decision to install 12 trailhead gates, fences, kiosks, and to close other existing trailheads. These changes were implemented during the summer months of 2013. The NPS requested clarification about the use of mountain bicycles in TA-70 and 71. A subcommittee of the Trails Working Group subsequently met and later recommended allowing bikes on established trails.

In response to United States Forest Service (USFS) concerns about trailhead damage along West Jemez Road, the Trails Management Program coordinated with the Integrated Project Review Program to include a setback notification distance for LANL project reviews near the LANL boundary. It was agreed that 100 yards would suffice as the appropriate distance triggered in the LANL Permits and Requirements ID System. The intent is to avoid instances where work negatively impacts resources and trails on County, USFS and NPS lands. In September 2013, damage occurred on lands accessed by the Anniversary Trail when a County subcontractor bypassed access controls at the trailhead and operated on drill rig on the mesa for a week. Subsequent investigations and discussions between DOE/NNSA, LANS, and the County led to an agreement that the damage will be repaired by the County and its subcontractor(s). Coordination for County project will happen prior to work initiation in the future.

In 2013, the Volunteer Task Force Board (VTF) notified the Trails Management of its decision not to sign the revised Institutional Agreement between LANS and the VTF. The VTF cited costs of insurance coverage required by the agreement, competing priorities, and limited resources in its decision. Alternatives that would continue to allow volunteers to conduct trails maintenance are being explored by the Trails Working Group in light of the VTF's decision.

3.2 Public Information

In June 2013, a public meeting was held in White Rock, New Mexico, regarding issues with trails use, cultural resources, and stewardship efforts at TA-70 and 71. Topics covered included: an overview of trails and trails etiquette, resource protection requirements and proposed area closures, designs for fencing and kiosks, fire conditions, restrictions and the area closure process, Park Service Patrols and trails use rules, unexploded ordnance, and where to find trail information. The meeting was well attended mostly by local residents and long-time trail users who generally thought that a more proactive management approach was warranted, while their concerns about losing access were acknowledged and addressed. A follow-on site visit was held in mid-July with affected residents, those who live in areas adjacent to the proposed fence. The solution was to install segments of new fencing and access gates for the affected properties.

In order to provide more information to the public, the Trails Management Program has revamped its external website. The updated public website is found http://www.lanl.gov/community-environment/environmental-stewardship/protection/trails.php. There is now also a trails blog for LANS employees to comment on trails conditions and updates at http://blog.lanl.gov/trails/

In a related effort, new trailhead signs (Figure 1) were finalized after considerable review by the Trails Working Group. These signs will replace the current signs installed several years ago. The objective is to provide consistent, clear and comprehensible messaging for all trail users at TA-70 and 71. Signs like the one below will be placed in the kiosks at entrances to TA-70 and 71.

Figure 1. New trailhead sign.

3.3 Cultural and Biological Resources Protection

A primary focus of the Trails Management Program was cultural resources protection in FY 2013, specifically the efforts described above enhancing controls and patrolling at TA-70 and 71.

As part of the Laboratory's Habitat Management Plan, which provides a strategy for the protection of threatened and endangered species and their habitats on LANL property, Mexican Spotted Owl surveys began on March 1 and concluded mid-May. There were seasonal trail closures when the surveys were conducted. Most trails were reopened, but trails in areas where the surveys indicated owls were present remained closed until August 31. The Mexican Spotted Owl (*Strix occidentalis lucida*) and Southwestern Willow Flycatcher (*Empidonax trailii extimus*) are federally listed threatened or endangered species. Reopening the Los Alamos Canyon Trail was discussed, as was the possibility of including it in the Bandelier National Monument patrol area. Issues concerning Mexican Spotted Owl impacts in the canyon, and PCB cleanup would need to be resolved before the area could open to the public. The Jemez Mountain Salamander was also listed as an endangered species in 2013 and some parts of Los Alamos Canyon are potential habitat.

In FY 2013, the Trails Working Group continued to review the problem of feral cattle in White Rock Canyon (where there are popular hiking trails). This is a trails management issue for several reasons. The canyon is part of the White Rock Canyon Reserve, which is an inappropriate place for bovines. There are sensitive species present, and there is a potential for the cows to damage habitat and cultural resources, and they threaten the safety of hikers because they are not tame. Cameras were installed on the Ancho Springs Trail in FY 2013 and they

showed lots of wildlife including bear, cougar, bobcat, and also cattle. A report with recommendations for feral cattle removal options was submitted to the Field Office.

3.4 Security and Safety

During FY 2013, the Trails Management Program continued to coordinate with Bandelier National Monument law enforcement on patrols and trespassing issues. This has been facilitated by the revised Superintendent's Compendium and agreement between DOE/NNSA and the NPS that allows enforcement pursuant to 36CFR on certain DOE lands at LANL. LANS cultural resources staff contacts Bandelier when they conduct fieldwork in the areas patrolled by NPS. The Trails Working Group contacts LANS security and the Los Alamos Police Department on matters of unauthorized trails use and parking to access trails. The Trails Management Program also coordinated with the Los Alamos County Trails and Open Space Program on a variety of issues affecting both Los Alamos County and LANL/DOE, including trails maintenance, closures, and way-finding.

The Trails Working Group also continued to review reopening Los Alamos Canyon to the public for hiking and bicycling during FY 2013. In July, a representative from the LANS Environmental Programs Directorate provided the Trails Working Group with an overview of the corrective actions activities that have occurred and those that are still planned by DOE and LANS to address the New Mexico Environment Department (NMED) Consent Order over the next few years to remediate legacy contamination in and around Los Alamos Canyon. The goal is to remediate to a level acceptable in the future and NMED must concur with the chosen methods and approve the final investigation report that demonstrates all necessary work has been completed.

Stage 3 fire restrictions began in June 2013 on most LANL trails with the exception of the Wellness Trails and at TA-70 and 71, but these were later rescinded with the onset of the monsoon rains. In early September extreme flooding impacted much of the LANL site. Preliminary assessments conducted at the end of FY 2013 indicated that the rains affected LANL canyons, trails, monitoring stations, and a variety of other mission activities and resources. Further evaluations may be conducted in FY 2014, but there have been no trail closures at LANL resulting from the rains and flooding.

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Appendix IV
Special Environmental Assessment (SEA)
Annual Reporting for Heritage Resources
Fiscal Year 2013

Los Alamos National Laboratory
Los Alamos, New Mexico

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Contents

Executive Summary

This report summarizes the Fiscal Year (FY) 2013 monitoring results of archaeological sites (both Ancestral Pueblo and homestead-era sites) and historic buildings damaged or otherwise impacted by the May 2000 Cerro Grande Fire. The project was conducted in compliance with the *Special Environmental Analysis for Actions Taken in Response to the Cerro Grande Fire* (SEA) (DOE 2000) by members of the Environmental Stewardship Group.

The SEA monitoring project was undertaken to evaluate and stabilize archaeological sites and historic buildings situated on Los Alamos National Laboratory (LANL) lands that were impacted by the Cerro Grande Fire. The annual review of cultural resources within areas prone to flooding or soil erosion was to continue until post-fire storm event water flow regimes approximated pre-fire flow rates according to modeling information and monitoring results (DOE 2000). Furthermore, consultation with the New Mexico State Historic Preservation Officer and with local pueblos and tribes throughout the course of implementing the mitigation action plan was expected to result in the identification of additional sites at LANL that would require stabilization and protection. Generally, these measures consisted of the placement of sandbags, straw bales, jute matting, rock check dams, and other similar preventive measures.

LANL returned to pre-fire hydrologic conditions in 2008 and subsequent work under the SEA has been conducted to complete required rehabilitation actions. The FY 2013 SEA annual report serves as the final report related to archaeological site and historic building impacts resulting from the May 2000 Cerro Grande Fire and closes out all SEA commitments related to LANL cultural resources affected by the fire. Future monitoring, assessments, and/or rehabilitation of these sites will be conducted as part of implementation of the Cultural Resources Management Plan.

Prehistoric (Ancestral Pueblo) Sites

Mitigation History

Cultural resources management staff from the Environmental Stewardship Group Resources Management Team (RMT) are responsible for conducting work required in the *Special Environmental Analysis for Actions Taken in Response to the Cerro Grande Fire* (SEA) at prehistoric and historic archaeological sites (DOE 2012; DOE 2009, 2010, 2011). Large areas of Los Alamos National Laboratory (LANL) have been subject to intensive archaeological surveys by cultural resources staff to assess the range of impacts from the Cerro Grande Fire on prehistoric sites (Nisengard et al. 2002). A report on these surveys was prepared for the U.S. Department of Energy, National Nuclear Security Administration, Los Alamos Site Office (now the Los Alamos Field Office) in 2002 (Nisengard et al. 2002). Rehabilitation at 107 archaeological sites, identified during these surveys, was conducted in 2003 by a team from the Pueblo de San Ildefonso. This rehabilitation consisted of the removal of burned snags, the thinning and slashing of some unburned or partially burned trees, the placement of straw wattles, the filling of stump holes, and revegetation using the seeds of native grasses and shrubs. In addition, three-strand smooth wire fences were erected along and around 87 sites situated near fire roads or other areas potentially vulnerable to fire suppression activities. Single sites as well as clusters of sites were fenced.

In August and September 2005, archaeological site monitoring was performed by LANL cultural resources staff at 96 of the 107 rehabilitated sites (Nisengard et al. 2005). Seven of the 11 sites not visited were situated in Rendija Canyon and had been excavated as part of mitigations associated with the Land Conveyance and Transfer Project and were no longer eligible for the National Register of Historic Places. The remaining four sites (three in Rendija Canyon and one in Technical Area [TA] 36) could not be visited due to logistical considerations with respect to LANL mission activities. The purpose of the monitoring effort was to evaluate the success of the 2003 mitigations and to recommend additional monitoring and/or mitigation actions at these 107 sites, as warranted. Several sites required no additional monitoring or treatment and subsequently, did not require annual visits (Nisengard et al. 2005).

In Fiscal Year (FY) 2006, cultural resources staff conducted SEA Mitigation Action Plan (MAP) field checks at 32 Ancestral Pueblo sites in various LANL technical areas and at two fenced areas in Rendija Canyon. These 34 locations were identified in the 2005 SEA MAP cultural resources report as requiring potential mitigation actions in the near future (Nisengard et al. 2005). The same 34 sites were revisited in FY 2007 and FY 2008, but no photographs were taken in FY 2008. In 2008, cultural resources staff determined

that rehabilitation was complete at seven sites, and that they should be removed from the annual monitoring requirement.

FY 2009 field checks were conducted at the 25 remaining sites and the two Rendija Canyon locations recommended for continued monitoring. Twenty-eight sites were assessed during the FY 2009 SEA MAP monitoring program. The two areas in Rendija Canyon were removed from SEA MAP monitoring in FY 2009. Eight sites were recommended for removal from the annual monitoring requirement in FY 2009, leaving 18 sites for continued monitoring.

FY 2010 SEA MAP monitoring was undertaken by a two-person team in July and August 2010. Most of the individual site issues identified in FY 2009 persisted in FY 2010. Of the 18 prehistoric sites assessed in FY 2010, two were recommended for rehabilitation and/or treatment and 15 were slated for additional mitigation (e.g., fence repair, snag removal, and wattle installation) in FY 2011.

FY 2011 SEA MAP monitoring was undertaken by a two-person team in August 2010. Nearly all of the sites slated for monitoring and mitigation during FY 2011 had returned to pre-fire conditions and required no further action. The five sites identified for FY 2012 rehabilitation actions required wattle installation and hydroseeding; one site (LA 4697) required an assessment by a LANL stormwater subject matter expert (SME).

FY 2012 SEA MAP monitoring was undertaken by a two-person team in July 2012. Five sites had wattles installed to reduce storm water erosion. The LANL stormwater SME agreed that wattle installation was the best course of action for LA 4697. Hydroseeding was not an option as funds were limited.

FY 2013 Observations and Rehabilitation Actions (Prehistoric Sites)

Five sites were assessed by RMT cultural resources staff in FY 2013 based upon recommendations made in FY 2012 (DOE 2011). This assessment resulted in a determination that all five sites were stable but still needed continued annual monitoring. At four of the five sites assessed in 2013, additional annual monitoring is recommended to determine if the erosion controls that were installed have remedied the identified issues or if additional erosion controls are needed. At these sites, it is recommended that the integrity of straw wattles be assessed because they degrade over time and may need to be replaced (Figures 1 and 2). At the fifth site, LA 136825, continued annual monitoring is also recommended because there are standing burned trees or snags that have the potential to fall within the site area and damage the perimeter fence. However, since the SEA MAP's original site monitoring and rehabilitation commitments have been met and FY 2013 is the final year of SEA

fieldwork, long-term site monitoring at these sites will be conducted as part of implementation of the Laboratory's Cultural Resources Management Plan (CRMP).

Figures 1 (top) and 2 (bottom).

Straw wattle installation at LA 4602B (top, FY 2012; bottom, FY 2013).

Table 1 summarizes the recommendations and rehabilitation actions from the FY 2013 SEA MAP monitoring.

Table 1. Prehistoric (Ancestral Pueblo) sites revisited by the RMT from FY 2012–2013. Green cells indicate monitoring and associated recommendations.

Site Number	TA or Canyon	FY 2012 Recommendations / Mitigations	FY 2013 Recommendations / Mitigations
LA 4601B	TA-5	Installed wattles on north side of site adjacent to road. Recommend hydroseeding in FY 2013. One additional year of monitoring to determine the success of the FY 2012 treatment.	Recommend annual monitoring to determine the success of the FY 2012 treatment. Since this is the last year of the SEA monitoring program, future work will be carried out as part of the regular cultural resources program detailed in the LANL CRMP.
LA 4602A	TA-5	Installed wattles to stabilize erosion. Recommend hydroseeding in FY 2013. One additional year of monitoring to determine the success of the FY 2012 treatment.	Continue to monitor annually to determine the success of the FY 2012 treatment. Since this is the last year of the SEA monitoring program, future work will be carried out as part of the regular cultural resources program detailed in the LANL CRMP.
LA 4602B	TA-5	Installed wattles to stabilize erosion. Recommend hydroseeding in FY 2013. One additional year of monitoring to determine the success of the FY 2012 treatment.	Continue to monitor annually to determine the success of the FY 2012 treatment. Since this is the last year of the SEA monitoring program, future work will be carried out as part of the regular cultural resources program detailed in the LANL CRMP.
LA 136825	TA-16	Continue monitoring of a few standing trees, which appear to be dead and have the potential to fall onto the site. Damage could displace architectural stones or damage the perimeter fence.	Continue to monitor the remaining burned trees/snags that have potential to fall on the site and potentially damage the perimeter fence. Since this is the last year of the SEA monitoring program, future work will be carried out as part of the regular cultural resources program detailed in the LANL CRMP.
LA 4697	TA-49	Installed wattles to stabilize erosion. Recommend hydroseeding in FY 2013. One additional year of monitoring to determine the success of the FY 2012 treatment.	Continue to monitor annually to determine the success of the FY 2012 treatment. Since this is the last year of the SEA monitoring program, this future work will be carried out as part of the regular cultural resources program detailed in the LANL CRMP.

Homestead- and Depression-Era Sites (circa 1887–1942)

The FY 2012 SEA annual report documented the removal of hazard trees at several archaeological sites associated with the homestead and depression eras. The FY 2012 report, however, did not recommend additional rehabilitation work at these sites because they were no longer at risk for data loss due to fire-related impacts.

Manhattan Project and Cold War Historic Buildings and Structures (1942–1963)

The FY 2012 SEA annual report also recommended continued work at V-Site, including repairs to concrete pads, berms, and building foundations that were burned during the Cerro Grande Fire (DOE 2012). Other recommendations included the continued evaluation of burned artifacts at V-Site for retention or disposal, pending the availability of a more appropriate storage facility.

FY 2013 Observations and Rehabilitation Actions (Historic Buildings)

RMT staff visited V-Site (TA-16-516 and TA-16-517) frequently during FY 2013, conducting tours and inspecting site conditions. Site work carried out in FY 2013 included replacing the cover of a sub-floor pit located in the foundation of V-Site's Radiography Building, one of the buildings that burned during the Cerro Grande Fire (Figure 3). The pit cover had been damaged during the fire and eventually became so deteriorated that it was identified as a fall hazard and marked with caution tape and cones (Figure 4). In addition, the pit cover was initially thought to contain asbestos and was sampled and characterized to rule this out prior to disposal. The open pit was then covered with a metal plate to lessen the risk to wildlife and site visitors.

Chain and post barriers previously installed at V-Site near areas burned during the Cerro Grande Fire were repaired and additional sections of chain and post were installed in order to keep visitors away from site hazards. An area of Hubbelite™ non-sparking flooring located in front of TA-16-516 has deteriorated substantially since the fire. This historic, outdoor work surface was used to support high explosives operations at V-Site. The flooring was chained off as part of the FY 2103 rehabilitation work to prevent further damage from foot traffic (Figure 5).

The building at TA-18 that will eventually house the artifacts from V-Site is still not ready to accept additional collections so no progress was made during FY 2013 on the curation of the burned artifacts currently stored at the site. However, historic building materials left over from post-fire restoration work and scheduled for disposal were removed from V-Site during the summer of 2013 (Figure 6). Additional work at V-Site included checking the site's entry road and other paved areas for hazards to site visitors, such as rusty nails and small pieces of wire from the burned buildings.

Figures 3 (top) and 4 (bottom).
Views of pit located at former Radiography Building, V-Site.

Figure 5.
New chain and post barrier protecting the Hubbelite™ work surface.

Figure 6.
Wood and metal building debris removed from the site in FY 2013 (Center of the photograph).

Fire-damaged areas still exist at V-Site, including the concrete pads and eroding earthen berms associated with buildings burned during the fire. Additional restoration work, however, will be conducted under applicable cultural resources programs described in the LANL CRMP.

SEA Closeout

In 2005, after damage assessments and initial rehabilitation actions were completed, SEA fieldwork and reporting focused on the 96 prehistoric archaeological sites, 14 historic homestead-era sites, and 13 historic buildings needing additional rehabilitation work or other follow up actions as a result of the fire and subsequent flooding (Nisengard et al. 2005).

Since then, affected cultural areas have been revisited annually and many rehabilitation projects have been conducted. Over the course of the SEA project, work to mitigate the damage to prehistoric (Ancestral Pueblo) sites has included removing burned snags and downed trees, installing straw wattles, filling stump holes, re-vegetating sites using native seeds, repairing fences, and installing new fencing.

Rehabilitation work at homestead-era sites and at historic building areas has included tree and vegetation removal, erosion control projects, fence repair and barrier installation, repairs to building areas (including the stabilization of burned structures), evaluation of burned artifacts, in-field artifact analysis, and the reevaluation of National Register of Historic Places eligibility for extensively damaged sites.

Each year as part of the SEA reporting process, archaeological sites and historic buildings have been removed from the annual monitoring list once the various areas have stabilized and erosional risks or other threats have been reduced through rehabilitation efforts or through the passage of time. As of FY 2013, most of the cultural resources initially identified for monitoring or rehabilitation work are no longer visited annually. Any remaining monitoring and repair work required at V-Site and at the five archaeological sites identified in FY 2013 will be conducted as part of the Laboratory's cultural resource compliance work outlined in the LANL CRMP.

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