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National Nuclear Security Administration

Dual-Axis Radiographic Hydrodynamic Test Facility

Mitigation Action Plan

Annual Report for 2001

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February 25, 2002

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

If you have any questions regarding these MAPARs or other NEPA issues, I can be reached at 528 35th Street, Los Alamos, NM, or by e-mail: ewithers@doeal.gov. I can also be reached by facsimile at (505) 667-9998 or by telephone at (505) 667-8690.

Sincerely,

Elizabeth R. Withers
NEPA Compliance Officer
Office of Facility Operations

OFO:3EW-1138

Enclosures

		continue to conduct institutional monitoring of Outfall 03A-113 as required under the Clean Water Act.
Monitoring wetland development: increased discharge from Outfall 03A-113 could potentially form a wetland in Sandia Canyon.	If a wetland forms, LANL will conduct further biological evaluation and wetland monitoring. NEPA analyses and wetland regulatory compliance evaluation will be conducted by DOE before flow to wetland from NPDES Outfall 03A-113 is eliminated.	TERMINATED: Wetlands have not developed to date. ESH-20 has confirmed that future outfall discharges will be minimal and below volumes that would result in development of wetlands.

In the event funding becomes available to pursue further uses of the current LEDA facility, the NEPA Compliance Office at OLASO will evaluate the proposed action and determine if additional NEPA documentation is required.

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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 a status on specific DARHT facility design- and operation-related mitigation actions that have been implemented in order to fulfill DOE commitments under the DARHT Environmental Impact Statement (EIS) Record of Decision (ROD; DOE 1995) and MAP.

The NNSA Office of Los Alamos Site Operations (OLASO; formerly the Los Alamos Area Operations [LAAO] Office) represents the DOE entity responsible for implementing the DARHT MAP. On January 29, 2001, DOE provided stakeholders with a complete MAPAR that reported on the full scope of commitments and action plans implemented under the DARHT MAP during fiscal year (FY) 2000. DOE LAAO did not receive stakeholder comments on the FY 2000 MAPAR. This MAPAR reports on the full scope of actions that were implemented during FY 2001 (October 1, 2000 through September 30, 2001) and represents the second 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

The DOE issued the Final EIS on the DARHT Facility (DOE/EIS-0228) at Los Alamos National Laboratory (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 National Environmental Policy Act (NEPA) as stated in DOE's Final Rule and Notice for implementing NEPA [10 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 ten years (the Phased Containment Option of the Enhanced Containment Alternative). 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 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) 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 measures 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 (USFWS) 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 in order 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 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 operational-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 and tracking system 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 archeological 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 Close-out

The DARHT MAP is scheduled to 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 operation. This

information generally refers to when an individual action is planned to 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 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 1st axis. In the late fall of 2000 the first major hydrotest using the DARHT 1st axis was performed. Also, during the late summer of 2000 two very simple high explosive shots using 16 lb of TNT were performed. The purpose of these two experiments was to acquire accelerometer data on the building at the Nake'muu archeological site. In the summer of 2001 one major system checkout experiment and three major hydrotests were performed. Each of the four experiments returned state-of-the-art quantitative radiographic information. The final three hydrotests illuminated the complex hydrodynamics of mock-ups of stockpiled systems. A joint LANL/Lawrence Livermore National Laboratory team initiated the use of DARHT as a National User Facility through the successful execution of the final complex experiment in the late summer of 2001. Also, during 2001 the DARHT Project continued the major installation of the injector and accelerator components of the 2nd axis of DARHT, which is approximately 80% complete. Finally, the construction of the Vessel Preparation Facility (VPF) was started in late summer of 2001.

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 and tracked using a formal project management system. On an annual basis, critical information and data gathered during the implementation of mitigation actions are analyzed and summarized; these results are published in the MAPAR.

The NNSA OLASO NEPA Compliance Officer (NCO) is ultimately responsible for implementing the DARHT MAP. The NCO has delegated MAP management and tracking to the Ecology Group (ESH-20). Using an annual WPA, ESH-20 coordinates with the appropriate LANL organizations to ensure mitigation action implementation, to maintain the tracking system, 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 to mitigations or 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 four main sections: introduction and background; MAP implementation; MAP scope, schedule, and status; and future MAPAR implementation.

3.0 DARHT MAP SCOPE, SCHEDULE, AND STATUS

The MAPAR documents the scope of mitigation action tasks that were implemented throughout FY 2001. The scope of tasks completed in FY 2001 represents the second year of operations-related mitigation measures. A summary of the scope of potential impacts and commitments addressed in this MAPAR is provided in Table 3-1.

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

DARHT MAP Potential Impacts/Commitments	DARHT phase	MAP page reference	MAPAR section
A. General Environment			
1. Contamination of the environment surrounding DARHT facility with radioactive or toxic material: commitments (b – e).	operations	5 – 6	3.1
2. Contamination of the environment with various types of wastes as a result of cleaning out the containment vessels.	operations	6	3.1
3. Contamination of the environment with various types of hazardous materials as a result of spills within the DARHT facility.	operations	6	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	6	3.1
B. Soils			
1. Loss of soil and vegetation could occur during construction and operation of the DARHT facility as a result of severe storm water runoff: commitments (a – c).	operations	6 – 7	3.2
2. Soil erosion and damage to plants caused by additional construction and operational activities, especially off-road and ground-breaking activities: commitments (a – e).	operations	7	3.2
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	7 – 8	3.3
2. DARHT facility construction and operation could impact the Mexican spotted owl (*Strix occidentalis lucida*) as a result of noise from firings and other operations, as well as other activities at the firing sites: commitments (n – x).	operations	8 – 9	3.3
3. DARHT facility construction and operation could impact the peregrine falcon (*Falco peregrinus*) as a result of noise from firings and other operations, as well as other activities at the firing sites: commitments (a – b).	operations	9 – 10	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	10	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	10	3.3

Table 3-1 cont.

DARHT MAP Potential Impacts/Commitments	DARHT phase	MAP page reference	MAPAR section
6. DARHT facility construction and operation could impact the meadow jumping mouse (*Zapus hudsonius*) as a result of noise from firings and other operations, as well as other activities at the firing sites.	operations	11	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	11	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 archeological sites, especially Nake'muu, and the immediately surrounding environment: commitments (b, f – g).	operations	12	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).	operations	12 – 13	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).	operations	13	3.5
2. Adverse health effects on workers from radiation from DARHT facility operations: commitments (a, c).	operations	13	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 toxic and radioactive materials to be released to the general environment surrounding the DARHT facility. Toxic 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

MAP Section VIII. A. 1 (b – e): The operational mitigation actions associated with this potential impact are as follows:

b) ESH-20 will monitor contaminants by sampling soil, plants, mammals, birds, and roadkills at baseline locations, 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.

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

e) Vessels will be decontaminated.

Status

MAP Section VIII. A. 1 (b): Since 1996, ESH-20 has collected and analyzed soil, sediment, and vegetation samples around the DARHT facility. The levels of heavy metals and radionuclides in these samples are compared to the Regional Statistical Reference Levels (RSRLs) identified as part of LANL's Environmental Surveillance Program. In 1997, ESH-20 began collecting honeybee, bird, and small mammal tissue samples around the DARHT facility for the construction phase. The results of four years of analysis of DARHT samples is summarized in a composite report (LANL 2001) and were used to calculate the Baseline Statistical Reference Levels (BSRLs), to be used as reference for the operational phase analyses. In FY 2000, ESH-20 began the operational phase environmental monitoring by collecting a suite of samples similar to those collected during the construction phase. All FY 2001 samples have been collected, processed, and submitted for chemical analyses. The analytical results indicate that concentrations of toxic and radioactive materials for soil and vegetation samples are below or comparable to the RSRLs. The results of honeybee and small mammal sampling are pending and will be reported in the 2002 MAPAR. There were not enough target species of birds captured in 2001 to submit samples for analysis.

The analysis of the small mammal and bird samples for the year 2000, the first year of DARHT operation, indicate that the concentrations of radionuclides and heavy metals were below the RSRLs. The honeybee data show that, in general, most radionuclide concentrations, with the exception of B-214, Pu-238, Pu-239, and Co-57, were within the RSRLs. Additionally, most heavy metal concentrations, with the exception of Ba and Cu, were within the RSRLs.

Colony 1 had concentrations that exceeded the RSRL for B-214, Pu-238 and Ba. Colony 2 had concentrations that exceeded the RSRL for Pu-239 and Ba. Colonies 3 and 4 concentrations exceeded the RSRL for Ba. Colony 5 had concentrations that exceeded the RSRL for Co-57 and Ba. Of the samples that exceeded the RSRL levels, only the Pu-238 sample exceeded the BSRL as reported for the DARHT construction phase concentrations (LANL 2001). The BSRL for Pu-238 is 0.0267 pCi/g.

An ecological dose assessment was calculated to estimate the dose to honey bees as a result of the elevated Pu-238. Measured activity concentration for Pu-238 in bees was 0.2 pCi/g ash weight which converts to 0.002 pCi/g fresh body weight (assuming 1% of the body weight remains as ash after ashing [Fresquez and Ferenbaugh 1999]). Calculating the dose to an individual bee by multiplying the dose conversion factor for Pu-238 (5.7×10^{-3} rad/day per pCi/g fresh body weight) times the concentration in the live bee yields a dose of 1.1×10^{-5} rad/day. DOE has established an interim dose limit of 0.1 rad/day for the protection of terrestrial wildlife, including invertebrates (honeybees). This limit is consistent with international criteria for protection of non-human biota. The calculated dose to bees at DARHT falls well below (4 orders of magnitude) this protective limit; therefore, this dose is not expected to cause harm to terrestrial wildlife near the DARHT facility. ESH-20 will continue its biological monitoring program during the DARHT operational phase.

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 be inclusive of environmental monitoring requirements under

this mitigation action. Should the DARHT facility experience a substantial accidental spill or release of toxic or radioactive materials, additional environmental monitoring would be conducted under this mitigation action as necessary. There were no substantial accidental spills or releases of toxic or radioactive materials associated with DARHT facility operations during FY 2000.

MAP Section VIII. A. 1 (d): The process of designing and testing vessels for operational use is proceeding as scheduled but is not complete. According to the ROD for the DARHT Final EIS, DOE is operating the DARHT facility while implementing a program to conduct most tests inside steel containment vessels with containment to be phased in over ten years (the Phased Containment Option of the Enhanced Containment Alternative) (DOE 1995). In the last quarter of FY 2000, two very simple uncontained experiments using 16 pounds of high explosives and the first major uncontained hydrotest using the DARHT facility 1st axis were performed. The post-shot operations for the simple experiments and hydrotest were conducted according to the following established standard operating procedures (SOPs):

- DX-4 SOP 3 General Safety
- DX-4 SOP 4 General Firing Operations
- DX-4 SOP 31 Firing Operations at TA-15-312 Firing Area
- DX-DO SOP 1 Waste Management
- DX-DO SOP 6 Radiological Controls

These SOPs are implemented under the LANL Integrated Safety Management (ISM) system as an integral part of DARHT facility operations. In addition to the ISM system requirements, these SOPs appropriately address DARHT MAP commitments that are designed to minimize the short- and long-term release of contaminants (radioactive and toxic materials) to the DARHT facility site.

MAP Section VIII. A. 1 (e): In this second year of DARHT facility operations, the double- and single-walled vessels were not utilized for operational activities. LANL began construction of a permanent VPF to be operated at Technical Area (TA) 15 near the DARHT facility. This facility will be used to stage, and decontaminate as appropriate, the vessels used in the DARHT facility experiments. As an interim action, LANL will utilize existing facilities to decontaminate vessel materials until the VPF is operational.

Summary of Potential Impact

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

MAP Section VIII. A. 2: The cleaning operations will recycle materials as much as reasonably possible and use appropriate operation 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: In this second year of DARHT facility operations, the vessels were not utilized for operational activities. LANL has begun construction of a permanent VPF to be operated at TA-15 near the DARHT facility. This facility will be used to stage, and decontaminate as appropriate, the vessels used in the DARHT facility experiments. As an interim action, LANL will utilize existing facilities to decontaminate vessel materials until the VPF is operational. LANL has developed containment vessel cleanout processes in support of the commitment to decontaminate vessels used in experiments.

Pilot-scale tests using these processes were used to finalize design of a small-scale process line for the chemical treatment of debris. Installation and testing of this process-line has been completed. Based on data from this pilot testing, design work for the full-scale process line is underway. An engineering design basis, which summarizes process requirements, unit operations, and equipment requirements and specifications, has been finalized. Design and procurement of equipment for a physical separation unit have also been completed. Equipment testing and pilot-scale experiments have been used to evaluate and address the facility-specific recycling, waste minimization, and environment, safety, and health requirements for the anticipated full-scale operations.

Summary of Potential Impact

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

MAP Section VIII. A. 3: Spill containment (physical barriers or sills) within the DARHT facility has been 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 would be available and could be deployed in the event of an accident.

Status

MAP Section VIII. A. 3: Spill containment (physical barriers or sills) within the DARHT facility are in place and are maintained to contain all hazardous material spills that could occur. A Spill Prevention Control and Countermeasures Plan was completed and approved prior to beginning DARHT facility operations. This plan will be maintained for the life of the facility consistent with the requirements under the LANL ISM system. 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 SOPs. 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.

Summary of Potential Impact

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 contaminated water from the DARHT facility.

Mitigation Action Scope

MAP Section VIII. A. 4: Water flow from the DARHT facility 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 Hydrology Group (ESH-18) will act to bring the facility into compliance.

Status

MAP Section VIII. A. 4: Water flow from the DARHT facility is routinely monitored to ensure compliance with the NPDES permit for the DARHT facility site. During this second year of DARHT facility operations, there have been no reportable violations of the DARHT facility NPDES outfall permit. Facility management representatives are coordinating with ESH-18 personnel to site and manage an additional surface water monitoring station at the DARHT facility. ESH-18 will continue to work with DARHT facility representatives to monitor and implement the NPDES outfall permit and other surface water monitoring efforts.

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 storm water runoff. In addition, off-road and ground-breaking 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 NPDES permit Storm Water Pollution Prevention (SWPP) Plan to ensure that erosion and sedimentation are minimized and that drainage facilities are in place to control runoff. These measures

also provide mitigation measures to minimize potential impacts, including revegetation as addressed in the SWPP Plan.

d) The size of a vegetation buffer zone between the facilities and the edge of the mesa tops will be determined by ESH-20 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 SOPs that, in part, restrict facility workers to designated areas. Access to undesignated areas of the DARHT facility site is managed according to SOPs that restrict access to authorized personnel on special work assignments such as post-shot 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 operational activities must comply with the institutional process established under Laboratory Implementation Requirement (LIR) 404-30-02.0 – also known as the NEPA, cultural resources, and biological resources (NCB) LIR. The NCB LIR establishes the institutional requirements that are implemented to ensure that contractual work smart standards for NEPA, cultural resources, and biological resources are consistently met (LANL 2000). In addition to requiring full compliance with applicable NEPA, cultural resources, and biological resources federal regulations, the NCB LIR requires full and effective implementation of the LANL HMP. These standards are measured by performance criteria contained in the Laboratory Performance Requirement 404-00-00 Appendix 3 (Environmental Protection – Ecological and Cultural Resources). ESH-20 is the Office of Institutional Coordination for the NCB LIR and is responsible for developing, revising, and maintaining the document, as well as technically assisting the institution in full and effective implementation.

Under an institutional 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 starting a wildfire 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 the NCB LIR. In addition, the DARHT facility site forest thinning activities were conducted in consultation with the USFWS in order to ensure appropriate protection (such as vegetation buffer zones and erosion control) of Mexican spotted owl and other wildlife habitat in the area. 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 the NCB LIR.

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); AND 7 (A – B)

According to the DARHT MAP, DARHT facility construction and operation could impact threatened and endangered species. DARHT facility construction and operation could impact 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 threatened or endangered species potentially occurring in the project area. If present, the following species could be affected: peregrine falcon, northern goshawk, spotted bat, meadow jumping mouse, and Jemez Mountains salamander.

Mitigation Action Scope

MAP Section VIII. C. 1 (b – d); 2 (n – x); 3 (a – b); 4 (a – c); 5 (a); 6 (a); and 7 (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 ESH-20 on all DARHT facility site threatened and endangered species issues through the ongoing implementation of the LANL HMP. LANL conducts the necessary species monitoring and habitat protection measures required for the DARHT facility site through the HMP (LANL 1998).

Status

MAP Section VIII. C. 1 (b – d); 2 (n – x); 3 (a – b); 4 (a – c); 5 (a); 6 (a); and 7 (a – b): Since January 1999, LANL has fully implemented the HMP. During FY 2000, site-wide implementation of the HMP was included as part of the institutional requirements in the NCB LIR (LANL 2000). 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 fully addressed through the ongoing implementation of the NCB LIR.

3.4 Mitigation Actions for Cultural/Paleontological Resources

Summary of Potential Impacts

MAP SECTION VIII. D. 1 (B, F – 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 archeological sites, especially Nake'muu, and the immediately surrounding environment.

Mitigation Action Scope

MAP Section VIII. D. 1 (b, f – g): The operational mitigation actions associated with this potential impact are as follows:

Summary of Potential Impact

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. This 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 in order 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 ESH-20 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 1999). In addition, as part of the LANL Site-Wide EIS MAP, in FY 2000 LANL completed the Comprehensive Plan for the Consideration of Traditional Cultural Properties (TCPs) and Sacred Sites at Los Alamos National Laboratory. This DOE plan was approved in August 2000 and provides the institutional framework for identifying and documenting two specific types of cultural resources: TCPs and sacred sites (DOE 2000). 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 site surveys are being performed as part of the recovery from the Cerro Grande Fire and these data are currently being evaluated. Should new cultural resource sites be identified in the DARHT facility site area, the appropriate review and consultation process will be implemented. No new TCP or sacred site issues were identified during FY 2001. Any future TCP and sacred site issues will be addressed as part of the institutional process established under the DOE Comprehensive Plan for the Consideration of Traditional Cultural Properties and Sacred Sites at Los Alamos National Laboratory.

3.5 Mitigation Actions for Human Health and Safety

Summary of Potential Impact

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 SOPs that collectively address a wide range of potential impacts to worker safety and health. These SOPs 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 Impact

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. D. 2 (a, b): The operational 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.

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

Status

MAP Section VIII. D. 2 (a, c): Under the institutional implementation of the ISM system, DARHT facility operations are managed according to specific SOPs that collectively address a wide range of potential impacts to worker safety and health. DARHT facility accelerator operations are specifically addressed under the DARHT Axis I – SOP 210. This SOP requires appropriate training, radiation dosimetry program participation, and first axis acceleration operations that collectively protect workers for exposure to unacceptable levels of radiation.

4.0 FY 2002 MAP IMPLEMENTATION

Based on the scope and stage of the DARHT facility project, MAP commitments and action plans may be changed, added, or deleted as appropriate as a function of recommendations provided in each MAPAR. Modification to the scope of commitments and action plans are directed by DOE OLASO based on scientifically and legally defensible information that is generated during the implementation of the DARHT MAP.

In July 1999, all construction-related DARHT MAP mitigation commitments and action plans were completed. The FY 2001 DARHT MAP activities represent the second year of operational implementation. The DARHT MAP activities implemented during FY 2002 will be a continuation of DARHT facility operational phase MAP tracking and annual reporting. Should the scope of the DARHT facility project change during the operational stage, as part of the appropriate NEPA review, the scope of the DARHT MAP would be changed by NNSA as necessary.

CITATIONS

DOE 1995: *Dual-Axis Radiographic Hydrodynamic Test Facility Final Environmental Impact Statement Record of Decision,* DOE/EIS-0228, October 1995.

DOE 1996: *Dual-Axis Radiographic Hydrodynamic Test Facility Final Environmental Impact Statement Mitigation Action Plan,* DOE/EIS-0228, January 1996.

DOE 1999: *DOE Memorandum Requesting Concurrence on the Dual-Axis Radiographic Hydrodynamic Test Facility (DARHT) III: Expanded Area of Potential Effects; Cultural Resources Survey Report No. 110, LA-CP-99-36,* DOE Albuquerque Operations Office/Los Alamos Area Office memorandum, LAAME:6EW-540, April 6, 1999 (attached SHPO concurrence dated May 20, 1999).

DOE 2000: *A Comprehensive Plan for the Consideration of Traditional Cultural Properties and Sacred Sites at Los Alamos National Laboratory, New Mexico*, Department of Energy, Albuquerque Field Office – Los Alamos Area Office, August 2000.

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LANL 1998: *Threatened and Endangered Species Habitat Management Plan Overview,* Los Alamos National Laboratory, LA-LP-98-112, October 1998.

LANL 1999: *CD-4 Milestone for the Dual-Axis Radiographic Hydrodynamic Test Facility,* Los Alamos National Laboratory Memorandum, ESH-20/Ecol-99-0235, June 1999.

LANL 2000: *NEPA, Cultural Resources, and Biological Resources (NCB) Process*, Los Alamos National Laboratory Implementation Requirement, Los Alamos National Laboratory, LIR 404-30-02.0, January 2000.

Nyhan et al.: J.W. Nyhan, P.R. Fresquez, K.D. Bennett, J.R. Biggs, T.K. Haarmann, D.C. Keller, and H.T. Haagenstad, *Baseline Concentrations of Radionuclides and Trace Elements in Soils, Sediments, Vegetation, Small Mammals, Birds, and Bees around the DAHRT Facility; Construction Phase (1996 through 1999),* Los Alamos National Laboratory, LA-13808-MS, July 2001.