

U.S. Department of Energy/ National Nuclear Security Administration
Finding of No Significant Impact for the Environmental Remediation
at Lawrence Livermore National Laboratory Site 300 Pit 7 Complex

AGENCY: U.S. Department of Energy/National Nuclear Security Administration
(DOE/NNSA)

ACTION: Finding of No Significant Impact

SUMMARY: The U.S. DOE/NNSA has prepared an Environmental Assessment (EA), DOE/EA-1569, to assess the environmental impacts associated with the proposed environmental remediation at the Pit 7 Complex at the Lawrence Livermore National Laboratory (LLNL) Experimental Test Facility (Site 300). Based on the information and analyses in the EA and considering public comments, DOE/NNSA has determined that the proposed action is not a major federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act of 1969 (NEPA) 42 United States Code (U.S.C.) 4321 *et. seq.* Therefore, preparation of an Environmental Impact Statement is not required and DOE/NNSA is issuing this notice of Finding of No Significant Impact (FONSI).

PURPOSE AND NEED: The purpose of the proposed action would be to reduce contaminant concentrations in soil and ground water at the Pit 7 Complex, mitigate risk to human receptors, and restore water quality to protect beneficial uses of ground water in

the impacted areas. The need for the proposed action is to comply with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and applicable or relevant and appropriate requirements (ARARs) and remedial action objectives specific to cleanup at Site 300.

Site 300 is located in the Altamont Hills approximately 17 miles east of Livermore and 8.5 miles southwest of downtown Tracy. Site 300 is a restricted-access DOE/NNSA experimental test facility used in the research, development, and testing of non-nuclear weapon components. The Pit 7 Complex is located in the northwest portion of Site 300. From 1958 until 1988, debris from explosive tests was disposed in the Pit 7 Complex, which includes unlined landfill Pits 3, 4, 5 and 7. The waste placed in the pits included wood, plastic, material and debris from tent structures, pea gravel, and exploded test assemblies that were contaminated with volatile organic compounds (VOCs), nitrate, perchlorate, tritium, and depleted uranium. The proposed action would reduce these contaminant concentrations at the Pit 7 Complex, mitigate risk to human receptors, and restore water quality to protect beneficial uses of ground water in the impacted areas.

DESCRIPTION OF THE PROPOSED ACTION: The proposed action would remediate environmental contamination and includes the cleanup of contaminated ground water and hydraulic isolation of contaminated soil and landfill waste at the Pit 7 Complex as part of an ongoing process regulated under CERCLA. The proposed action analyzed in the EA was identified by DOE, LLNL, and regulatory agencies as the preferred interim

remedy for cleanup of the Pit 7 Complex in the *Proposed Plan for Environmental Cleanup at the Pit 7 Complex, Lawrence Livermore National Laboratory Site 300* (DOE 2006), which is a required plan under CERCLA.

The proposed action would consist of the following five remediation components: (1) installing an engineered drainage diversion system to isolate contaminant sources; (2) pumping and treating ground water to reduce contaminant concentration; (3) monitoring natural attenuation to allow tritium activities to decline naturally through radioactive decay; (4) conducting ground water monitoring; and (5) implementing institutional controls to manage risk and hazard.

ALTERNATIVES: Under the no action alternative, no environmental remediation activities would be conducted at the Pit 7 Complex. No new facilities would be constructed, and no additional ground-disturbing activities would take place. The no action alternative would not meet DOE's purpose and need to protect human health and the environment from past releases of contaminants and restore beneficial uses of natural resources by conducting cost-effective, science-based environmental restoration, or be in compliance with State and Federal requirements.

POTENTIAL ENVIRONMENTAL IMPACTS OF PROPOSED ACTION:

The proposed action would have minimal or no impact on the following elements of the human environment: floodplains, aesthetics, land use, socioeconomics, environmental

justice, wetlands, cultural resources, paleontological resources, noise, utilities/energy, public services, and traffic and transportation. More detailed discussion and analysis is provided for potential impacts in the areas of soils and surface water quality, biological resources, air quality, hazardous and radioactive waste management, human health, ground water quality and supply, and potential accidents.

Soils and Surface Water Quality: The proposed action would not lead to a significant adverse impact to soils and surface water quality. Potential impacts to soils during project construction are temporary wind- and water-induced erosion within a small area in which the construction would occur. Potential wind-induced erosion would be controlled by such measures as water spraying of disturbed areas and covering exposed piles of excavated materials. To minimize water-induced erosion and prevent increased sediment load from entering ephemeral stream drainages, work would comply with requirements of the State of California's General National Pollution Discharge Elimination System (NPDES) permit for discharges of storm water associated with construction activity.

Best Management Practices would be implemented during construction to prevent the mobilization of pollutants. Sediment and erosion control measures would be installed at the surface water outflows for the drainage diversion system and in the areas of construction of interceptor trenches in accordance with the project's construction storm water pollution prevention plan.

During facility operations and remediation implementation, the proposed action would have a beneficial effect of preventing the spread of contaminants in saturated subsurface soil and rock adjacent to and beneath the Pit 7 Complex area.

The project has the potential to cause soil erosion and siltation along and within the drainage channels that would receive surface water that is diverted away from the Pit 7 Complex landfills. To reduce this potential, the project would be engineered so as not to create or contribute runoff water that would exceed the capacity of drainage systems or that would cause excess sediment transport and erosion.

Biological Resources: No known populations of rare or endangered/threatened plant species are known to occur within the project impact area or immediate vicinity.

However, over the past ten years, five rare plants listed by the California Native Plant Society have been observed at various locations within 500 to 2,500 feet of the Pit 7 Complex. At the appropriate time of year, plant surveys would be undertaken within the project impact area prior to construction to determine if any of these or other protected plant species was present. If California Native Plant Society-listed plant species were found, to the extent feasible, their seeds would be collected and retained for future plant community restoration activities. If threatened/endangered or rare plant species were found, LLNL would consult with the U.S. Fish and Wildlife Service (Service) to identify appropriate measures.

Based upon a review of the U.S. Fish and Wildlife Service species index for the Site 300 area, and seasonal biological surveys of Site 300 and the Pit 7 Complex area undertaken over the past 20 years, Federally or State-listed or special concern wildlife species known to occur at the Pit 7 Complex or nearby, are:

- Western burrowing owl (*Athene cunicularia*)—Species of concern, Federal; Species of special concern, State.
- California tiger salamander (*Ambystoma californiense*)—Threatened, Federal; Species of special concern, State.
- Golden eagle (*Aquila chrysaetos*)—Protected, Federal; Fully-protected & Species of special concern, State.
- Ferruginous hawk (*Buteo regalis*)—Species of concern, Federal; Species of special concern, State.
- Loggerhead shrike (*Lanius ludovicianus*)—Species of concern, Federal; Species of special concern, State.
- San Joaquin coachwhip (*Masticophis flagellum*)—Species of concern, Federal; Species of special concern, State.
- Coast horned lizard (*Phrynosoma coronatum frontale*)—Species of concern, Federal; Species of special concern, State.

These Federally or State-listed or special concern wildlife species are not expected to be substantially affected by the proposed project for the following reasons:

Past biological surveys at Site 300 have indicated that western burrowing owls breed and occupy territories outside the southern boundary of the project impact area. Consistent with California Department of Fish and Game preference, during the breeding season (February to August), active nest sites at Site 300 are granted a 100-meter buffer radius that excludes activities that would negatively impact the species.

Although no western burrowing owl breeding sites have been observed within 100 meters of the project impact area, there is potential that such sites could be documented prior to initiation of construction activities during biological surveys of the project area. If this occurs, then no construction-related activities that would cause greater impacts than those already occurring at the site under normal conditions would be allowed within the exclusion zone. Once the breeding season was over, the exclusion zone would diminish in size to a fraction of its original area but to no less than a 15-meter (50-foot) radius. Should a natal burrowing owl den be discovered in the project area during biological surveys, this exclusion zone would be demarcated to protect the owls from construction activities until the breeding season has passed.

California tiger salamanders are recognized as having a known range of movement within 2 kilometers (1.2 miles) of their breeding pool. This 2-kilometer radius is used to describe areas of tiger salamander presence and activity by the Service and is used as a tool to gauge species/habitat disturbance associated with both upland and wetland area impacts (both breeding and non-breeding habitats). The Pit 7 Complex exists within the 2-kilometer radius of a known California tiger salamander breeding site (Ambrosino Pool)

lying to the west of the project area. Although the Pit 7 Complex itself has no water feature evident on the surface (except the concrete drainage collection system), it does offer potential upland habitat to this species, especially subterranean refugia present in the surrounding ground squirrel colonies. The Service may require compensation for lost upland habitat in the Pit 7 Complex area if construction is determined to be greater than a temporary loss of habitat value to the species. Specific measures to minimize impacts to the California tiger salamander and compensate for any permanent loss of habitat as a result of the construction and/or operation of the proposed remedial action at the Pit 7 Complex would be developed in DOE/NNSA's consultation with the Service prior to construction of the engineered drainage diversion system.

Golden eagles, ferruginous hawks, and loggerhead shrikes appear to use the area only for foraging purposes. Eagles have never been documented as nesting in this area historically, and ferruginous hawks are winter visitors (non-nesting). Therefore, the project is not expected to impact these bird species. Should a nest be discovered in the project area during biological surveys, an exclusion zone would be demarcated to protect the nesting birds from construction activities until the breeding season has passed.

San Joaquin coachwhips and coast horned lizards may occur in the Pit 7 Complex area. Pre-project surveys for special-status species would be conducted prior to construction-related activities, and a biologist would be available to respond to findings of special-status species in the project area during construction phases. Therefore, it is considered unlikely that species would be impacted by the project.

Air Quality: The proposed action would not lead to a significant adverse impact on air quality. Construction elements with the potential to impact air quality are mobile sources, such as truck and earth-moving equipment that would emit particulates and ozone precursors. Emissions from these sources would be minor and would be in conformance with the State implementation plan. Potential fugitive dust emissions generated by project construction activities would be controlled in accordance with air district requirements. Soil stabilization in disturbed areas may also include hydroseeding.

Elements of project operations with the potential to impact air quality are the use of backup generators to supplement the solar power in the event that solar power is used to run the ground water treatment facility and mobile sources, such as vehicles, brought to the site to conduct ground water monitoring and facility maintenance. Emissions from these sources would be minor and would be in conformance with the State implementation plan.

Hazardous and Radioactive Waste Management: The amount of hazardous and radioactive wastes that would be generated during construction represents a small percentage of Site 300's annual waste generation rate. Approximately eight 55-gallon drums of contaminated soil and rock would be generated by drilling the ground water extraction, injection, and monitoring wells representing approximately .03 percent of the waste generated annually at Site 300.

Under normal facility operating conditions, the ground water extraction and treatment system would generate less than three 55-gallon drums of waste per year. Waste minimization practices such as recycling the filter media would be employed to reduce generation of waste where possible. This waste represents less than .02 percent of the annual waste generation rate at Site 300.

All waste would be prepared for off-site shipment at the Site 300 waste characterization facilities in accordance with applicable Federal and State regulations, permits obtained under these regulations, and DOE orders, and shipped in accordance with U.S. Department of Transportation regulations.

Human Health: Minimal, short-term health risks may be posed to on-site workers during the construction phase from exposure to on-site contaminants. The results of the risk assessment for the Pit 7 Complex indicated that an unacceptable long-term exposure risk to human health is posed by the contaminants in the Pit 7 Complex area through inhalation of tritium evaporating from subsurface soil by any on-site workers who spend 8 hours a day, 5 days a week for 30 years at the Pit 7 Complex. Based upon this analysis, there would be a minor short-term health risk to on-site workers during the construction phase from inhalation of evaporating tritium because the construction phase would last only 3 to 4 months. Workers would use appropriate protective procedures, clothing, and equipment, as specified by LLNL Hazards Control, to prevent exposure during the installation of the extraction and treatment system. Construction of the hydraulic drainage diversion system occurs primarily outside the areas of contamination at the Pit 7

Complex. Exposure control measures would not be needed for work outside the areas of contamination.

The proposed action would have a beneficial effect on human health by (1) permanently controlling contaminant releases from the Pit 7 landfill waste and vadose zone through hydraulic diversion; (2) providing long-term permanent reduction of uranium, nitrate, and perchlorate in ground water through ground water extraction and treatment; (3) implementing site controls to prevent accidental exposure; and (4) providing a mechanism to monitor the effectiveness of the remedies.

On-site workers would be exposed to a minimal, short-term health risk during operations from exposure to on-site contaminants. This risk would be minimal because there would be no full-time workers housed in the area. In addition, ground water extraction and treatment would pose a short-term exposure risk by bringing uranium-contaminated and tritium containing ground water to the surface for treatment. Exposure control measures would be implemented to prevent exposure until uranium and tritium activities decay to health-protective levels. The extraction and treatment system would be designed as a closed-loop system to prevent workers from contacting contaminated ground water during system operations and maintenance. In addition, there would be minimal short-term exposure risk posed to treatment facility operators when handling contaminated spent reactive material from the treatment facility. The LLNL Hazards Control team would evaluate the need for personal protective equipment during treatment system sampling activities. Workers would follow operational safety procedures and use

appropriate protective procedures, clothing, and equipment specified by LLNL Hazards Control, to prevent exposure.

Ground Water Quality and Supply: The principal threat to ground water quality at the Pit 7 Complex is the landfill waste because contaminants associated with the waste are found at high concentrations, are toxic, and can be mobilized when ground water rises into the pit waste and underlying bedrock. The proposed project would improve this condition by (1) constructing an engineered drainage system to prevent ground water from rising into the Pit 7 landfill waste during periods of heavy rainfall and releasing contaminants, and (2) slowing the migration of pre-existing ground water contaminants in the area by reducing recharge to shallow ground water. It also would remove contaminated ground water present by pumping and treating the water in a system designed to remove VOCs, uranium, nitrate, and perchlorate.

Potential Accidents: On-site workers may be potentially exposed to Pit 7 Complex landfill contents or contaminated subsurface soil should they inadvertently excavate the landfill pits. However, institutional controls, such as the prohibition of ground-disturbing activities within the footprint of the landfills, are in place to prevent inadvertent excavation within the landfills. This prohibition is enforced through administrative controls, such as the required review of proposed construction activities at the site by LLNL Site 300 Management and Space and Site Planning.

There is some potential that a leak or rupture of the treatment system could occur causing a release of untreated ground water containing low concentrations of tritium, uranium, perchlorate, or nitrate to the ground. Because ground water in the treatment system and piping contains equivalent contaminant concentrations as the underlying ground water, it would not impact clean ground water quality. Any potential contamination of surface soil resulting from leaks would be addressed through sampling and, if necessary, removal of contaminated soil. Treatment facility operators conduct regular inspections of the treatment facility and pipelines to identify leaks or any other system malfunctions that could result in a release of contaminated water to the environment.

It is very unlikely that the proposed action would be the target of an Intentional Destructive Act. The Pit 7 Complex is located in the remote northwest corner of Site 300, and is protected by site access control and a full time security force. Consequences of an unlikely destructive act would be bounded by the accidents discussed in this section.

Cumulative Impacts: The proposed action would have minimal or no impacts on floodplains, aesthetics, noise levels, wetlands, cultural and paleontological resources, utilities/energy, aesthetics, environmental justice, and off-site police and fire protective services. The minimal environmental impacts from the proposed action in the areas of soils and surface water quality, biological resources, air quality, hazardous and radioactive waste management, human health, ground water quality and supply, and potential accidents would not contribute substantially to any significant cumulative impacts in these areas. Therefore, the proposed action would not contribute to any

adverse impacts related to past, present or reasonably foreseeable future actions. Over the long term, the proposed action would contribute to beneficial cumulative impacts due to the reduction in contaminant concentrations in soil and ground water.

PUBLIC COMMENTS ON THE DRAFT EA: The Draft EA was circulated for review and comment to the State of California and other interested stakeholders for a 30-day comment period that ended on September 21, 2006. Appendix A of the EA contains the DOE/NNSA responses to specific comments received during the public comment period.

DETERMINATION: Based on the information and analysis in the Environmental Assessment, DOE/EA-1569, and after consideration of all comments received, the DOE/NNSA has determined that the proposed environmental remediation at the LLNL Site 300 Pit 7 Complex does not constitute a major Federal action significantly affecting the quality of the human environment within the meaning of the *National Environmental Policy Act of 1969* (42U.S.C. 4321 et seq.). Therefore, an Environmental Impact Statement is not required.

PUBLIC AVAILABILITY:

Copies of this EA (DOE/EA-1569) are available from:

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