1.0 Purpose and Need

Chapter 1 presents the United States (U.S.) Department of Energy (DOE), National Nuclear Security Administration's (NNSA)[1] requirements under the *National Environmental Policy Act of 1969* (NEPA), background information on the proposal, the purpose and need for agency action, and a summary of public involvement activities.

1.1 Introduction

This Environmental Assessment (EA) incorporates information (tiers) from the *Environmental Impact Statement for the Conveyance and Transfer of Certain Land Tracts Administered by the U.S. Department of Energy and Located at Los Alamos National Laboratory* (LANL) (DOE 1999a), the *Site-Wide Environmental Impact Statement for Continued Operation of the Los Alamos National Laboratory* (SWEIS; DOE 1999b), the *RCRA Facility Investigation (RFI) Report for Potential Release Sites 73-001(a)-99 and 73-001(b)-99* (LANL 1998a), and the *Voluntary Corrective Measure (VCM) Plan for Potential Release Sites 73-001(a)-99 and 73-001(b)-99* (LANL 2002), and other environmental documents listed in Chapter 7, References.

1.2 National Environmental Policy Act Process

NEPA requires Federal agency officials to consider the environmental consequences of their proposed actions before decisions are made. In complying with NEPA, DOE and NNSA follow the Council on Environmental Quality regulations (40 Code of Federal Regulations [CFR] 1500-1508 [40 CFR 1500-1508]) and DOE's NEPA implementing procedures (10 CFR 1021). The purpose of an EA is to provide Federal decision makers with sufficient evidence and analysis to determine whether to prepare an Environmental Impact Statement (EIS) or issue a Finding of No Significant Impact.

The objectives of this EA are to (1) describe the underlying purpose and need for DOE action; (2) identify and describe any reasonable alternatives that satisfy the purpose and need for Agency Action; (3) describe baseline environmental conditions pertaining to the Airport Tract; (4) analyze the potential effects to the existing environment from implementation of the alternatives, and (5) compare the effects from these reasonable alternatives. For the purposes of compliance with NEPA, reasonable alternatives are identified as being those that meet NNSA's purpose and need for action by virtue of timeliness, appropriate technology, and applicability to LANL. This EA has been prepared to assess the potential environmental consequences of the corrective measure alternatives for the Airport Landfills, together with the No Action Alternative.

What the EA process does accomplish

The EA process allows NNSA to involve interested parties in their planning processes. It allows NNSA to inform those interested parties and Federal decision makers as to the effects to the human environment of those actions that could be taken. It allows for those interested parties to share their ideas about the proposed corrective measure alternatives with NNSA officials. It provides sufficient evidence and analysis for determining the significance of impacts from the corrective measure

[1] The NNSA is a separately organized agency within the DOE established by the 1999 *National Nuclear Security Administration Act* (Title 32 of the *Defense Authorization Act* for fiscal year 2000 [Public Law (PL) 106-65]).

alternatives. The corrective measure alternatives analyzed in this EA address potential containment and excavation alternatives and are intended to provide a bounding analysis of the potential environmental effects of implementing any corrective measure at the Airport Landfills. The Federal decision to be made in this EA process is to determine whether or not to prepare an EIS based on the significance of the environmental impacts.

What the EA process does NOT accomplish

The NNSA through the *Resource Conservation and Recovery Act* (RCRA) process selects a remedy and the New Mexico Environment Department (NMED) approves the remedy. The EA process is not intended to address or resolve liability, fiscal, or maintenance issues. Such issues are addressed separately in negotiations between Los Alamos County and the NNSA Los Alamos Site Office (LASO) through the real property process.

1.3 Resource Conservation and Recovery Act

RCRA, a concurrent but separate process, extends environmental protection to the land. RCRA was enacted in 1976 to address the huge volumes of municipal and industrial solid[2] waste generated nationwide. This law sets forth an intent to promote conservation of resources through reduced reliance on landfilling. Both solid waste and hazardous[3] waste are covered by this law under interrelated programs Subtitle D and Subtitle C, respectively. In RCRA, Congress established initial directives and guidelines for the Environmental Protection Agency (EPA) to regulate hazardous wastes from generation to ultimate disposal. In 1984, Congress amended RCRA by passing the Hazardous and Solid Waste Amendments (HSWA). In accordance with these provisions of HSWA, LANL's permit to operate hazardous waste treatment and storage units includes a section (called Module VIII or the "HSWA Module") that prescribes a specific corrective action program for LANL, which focuses primarily on the investigation and cleanup, if required, of inactive sites. In the State of New Mexico, NMED has been delegated RCRA corrective action authority from the EPA.

1.4 NMED Process or Phase II Work Plan Process

Remediation of the Airport Landfills would be a voluntary corrective measure [4] (VCM) conducted under the HSWA corrective action requirements and Module VIII of LANL's Hazardous Waste Facility Permit (EPA 1990). DOE is working with the State to reach an appropriate remedial measure to protect human health and the environment. On April 1, 2003, NMED granted conditional approval of a VCM Plan for the main landfill and the debris disposal area designated potential release sites (PRSs) 73-001(a)-99 and 73-001(b)-99, respectively. Conditions of this approval were 1) the final

[2] Solid waste, as defined in 40 CFR 261.2 and in 20 New Mexico Administrative Code (NMAC) 9.1, is any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility, and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities.

[3] Hazardous waste, as defined in 40 CFR 261.3, which addresses RCRA regulations, and by reference in 20 NMAC 4.1, is waste that meets any of the following criteria: a) waste exhibits *any* of the four characteristics of a hazardous waste: ignitability, corrosivity, reactivity, or toxicity; b) waste is specifically *listed* as being hazardous in one of the four tables in Subpart D of the CFR; c) waste is a mixture of a *listed* hazardous waste item and a nonhazardous waste; d) waste has been *declared* to be hazardous by the generator.

[4] VCMs are partial or complete cleanup activities undertaken at the initiative of the permittee (LANL) and approved by the New Mexico Environment Department (NMED), rather than in response to permit compliance schedules.

remedy must be equivalent to RCRA Subtitle C requirements, 2) the proposed engineered alternative cover (cap) must perform equivalent to or better than a standard Subtitle C prescriptive cover outlined in 40 CFR 265 Subpart N, incorporated by 20.4.1.600 NMAC, and 3) the alternative cover must function efficiently and in accordance with the design parameters for the duration of the 30-year post closure care period.

On March 1, 2005, NMED entered into a Consent Order with DOE and the University of California (UC) for the investigation and cleanup of solid waste management units (SWMUs) and areas of concern (AOCs) at LANL. (The term "PRSs" is not in the Order and is no longer used with respect to the Order. Instead, the terms "SWMUs and AOCs" are being used when referring to the Consent Order since these are both defined in the Order.) The Order replaces most of the corrective action requirements in Module VIII of the permit. Section XII of the Order contains a compliance schedule that specifically includes requirements for the airport solid waste disposal areas. Two deliverables are specified: 1) a Remedy Design Work Plan that has already been submitted; and 2) a Remedy Completion Report due March 31, 2007. The Remedy Design Work Plan, or Phase II Work Plan (DOE 2004), was submitted on April 23, 2004, and NMED conditionally approved the Work Plan on September 2, 2004. On December 22, 2004, NMED approved DOE's request for a six-month extension to respond to the conditional approval and to prepare an EA to consider remedy alternatives and perform an analysis of potential environmental consequences.

1.5 Site Description

The Airport Tract, on which the landfills are located, is in Technical Area (TA) 73 within the boundaries of DOE-administered land at LANL in Los Alamos, New Mexico (Figure 1). The Airport Tract is designated A-4, Airport-2 (North) in the LANL Land Conveyance and Transfer Program. It consists of an approximately 93-acre (ac) (37-hectare [ha]) parcel that was initially part of a larger, approximately 205-ac (83-ha) land tract called the Airport Tract. The boundaries of the entire Airport Tract are defined by the bottom of Los Alamos Canyon to the south and the mesa's edge to the north. The tract includes land on both sides of State Road (SR) 502, which serves as the main entrance to the community of Los Alamos. The area of the tract to the north side of SR 502 surrounding the airport's runway and support buildings is primarily grassland. Areas to the south of SR 502 are primarily covered in juniper-savannah with open shrub, grasslands, and wildflower areas.

The A-4 Airport Tract is located on the northeastern edge of the mesa above Pueblo Canyon and to the east of the Los Alamos town site (Figure 1). It is one of ten tracts of DOE-administered land scheduled for transfer to the incorporated County of Los Alamos or conveyance to the Bureau of Indian Affairs in trust for the Pueblo of San Ildefonso under PL 105-119 (42 U.S. Code [USC] 2391) and the agreement signed by the parties.

Currently, the airport handles both commercial and private air transportation, as well as emergency transport and support (for example, medical and fire response). Los Alamos County operates the airport, under a lease agreement with the DOE (DOE 1998a). Directly to the west of the airport and north of East Road is a single-family residential development (DOE 1998a). Directly to the east of the airport is the Small Business Center Annex on East Gate Drive, consisting of offices and other light commercial and retail land uses. Other land uses along SR 502 to the west and in reasonable proximity to the airport include several churches, a swimming facility, fire station, an office building, kennel, park, and a nursing home and assisted living facility (LAC 1998). Immediately to the north of

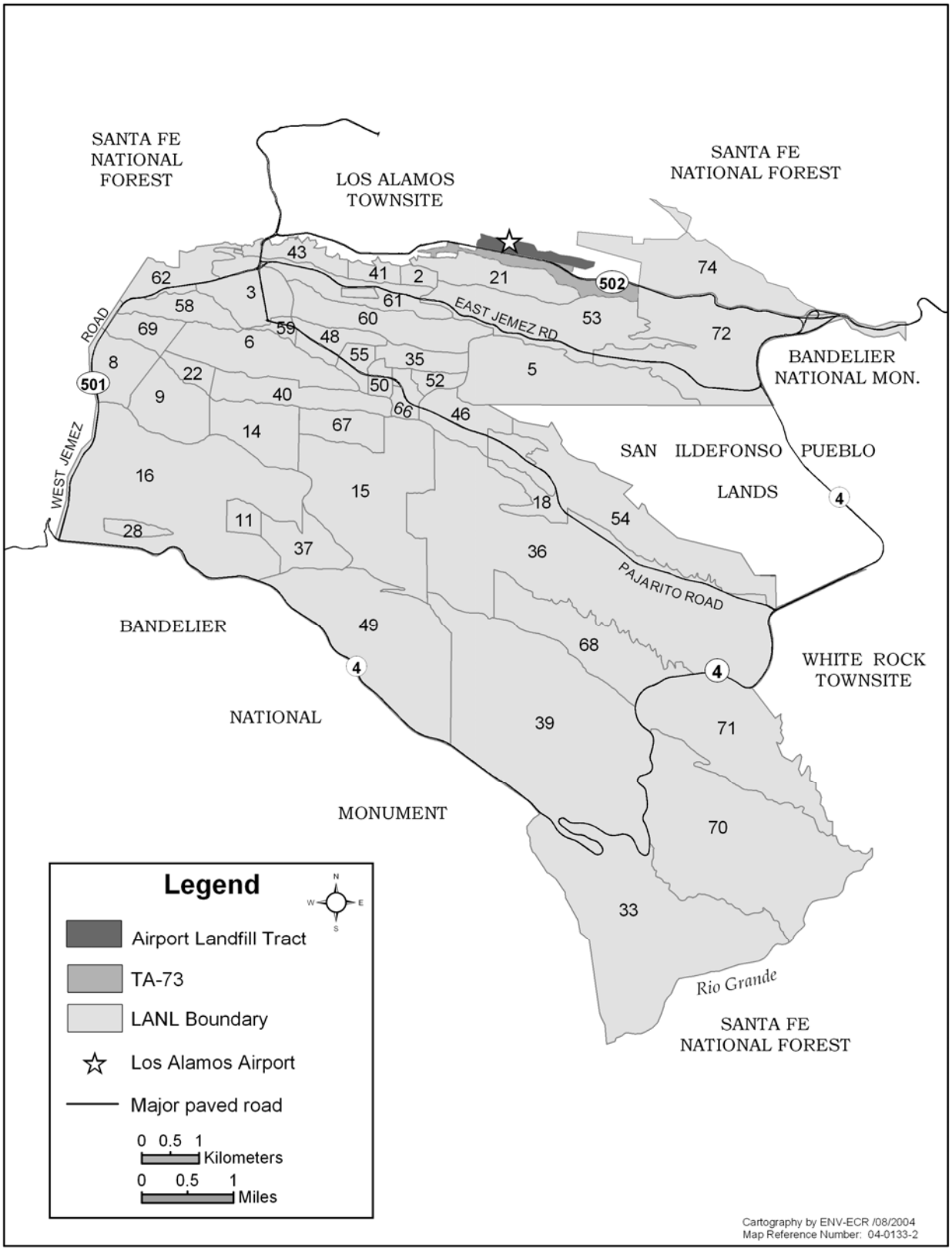

Figure 1. Location of Airport Tract within TA-73 at LANL.

the tract is a steep drop off the mesa's edge. Land on the south side of SR 502 is undeveloped area that serves as a buffer for LANL operations (DOE 1999a). The proposed project area is north and east of the active airport.

There are two inactive solid waste disposal areas on the Airport Landfills Tract. One site is referred to as the main landfill area and the other the debris disposal area (DDA). Both disposal areas are located immediately north of the Los Alamos Airport runway, between the runway and the edge of the mesa (Figure 2).

The main landfill area consists of a natural depression into which solid waste was disposed. The west and south sides of the main landfill coincide approximately with the edges of the asphalt tie-down area and the asphalt taxiway to the hot pad[5] (Figure 2), respectively. The north side extends approximately to the chain-link security fence along the north side of the airport. To the east, the landfill extends to the end of the natural depression and pinches out toward the hot pad. The main landfill covers a surface area of approximately 11.5 ac (4.6 ha) and contains volumes of sanitary waste estimated at 536,800 cubic yards (yd^3) (407,968 cubic meters [m^3]). Waste thickness varies from 1 foot (ft) (0.3 meters [m]) to 85 ft (26 m); waste disposed of most recently is found in the eastern half of the landfill where waste deposits are thickest.

The DDA lies east of the main landfill and consists of two roughly parallel trenches excavated to a maximum depth of approximately 35 ft (10.5 m). To the west, the trenches extend to within approximately 150 ft (45 m) of the windsock (Figure 2). To the east, the trenches extend approximately 800 ft (240 m) beyond the end of the runway. The DDA covers a surface area of approximately 5 ac (2 ha) and contains volumes of sanitary waste estimated at 126,000 yd^3 (95,760 m^3).

1.6 Airport Tract and Landfill History

Prior to 1948, the Airport Landfills Tract served as a municipal landfill upon which the Los Alamos Airport was ultimately constructed. Other past activities at the tract included the use of portions of the tract for construction supply and storage. Since 1948, the Airport Landfills Tract has primarily been used as a general aviation airport.

In 1943, the DOE began using the natural depression north of the airport runway as a municipal landfill. Los Alamos County household refuse and LANL office waste were collected twice a week and burned at the edge of the mesa (Miller 1963). Heavy equipment was then used to push the burned residues and ash into whichever landfill disposal area was being used at the time. This intentional burning ceased in 1965 when Los Alamos County assumed operation of the landfill (Miller and Shaykin 1966). Los Alamos County continued to operate the landfill until June 30, 1973, when landfill operations ceased (Drennon 1990).

[5] The hot pad is an area parallel to the Airport runway specifically designated for loading of hazardous materials and explosives.

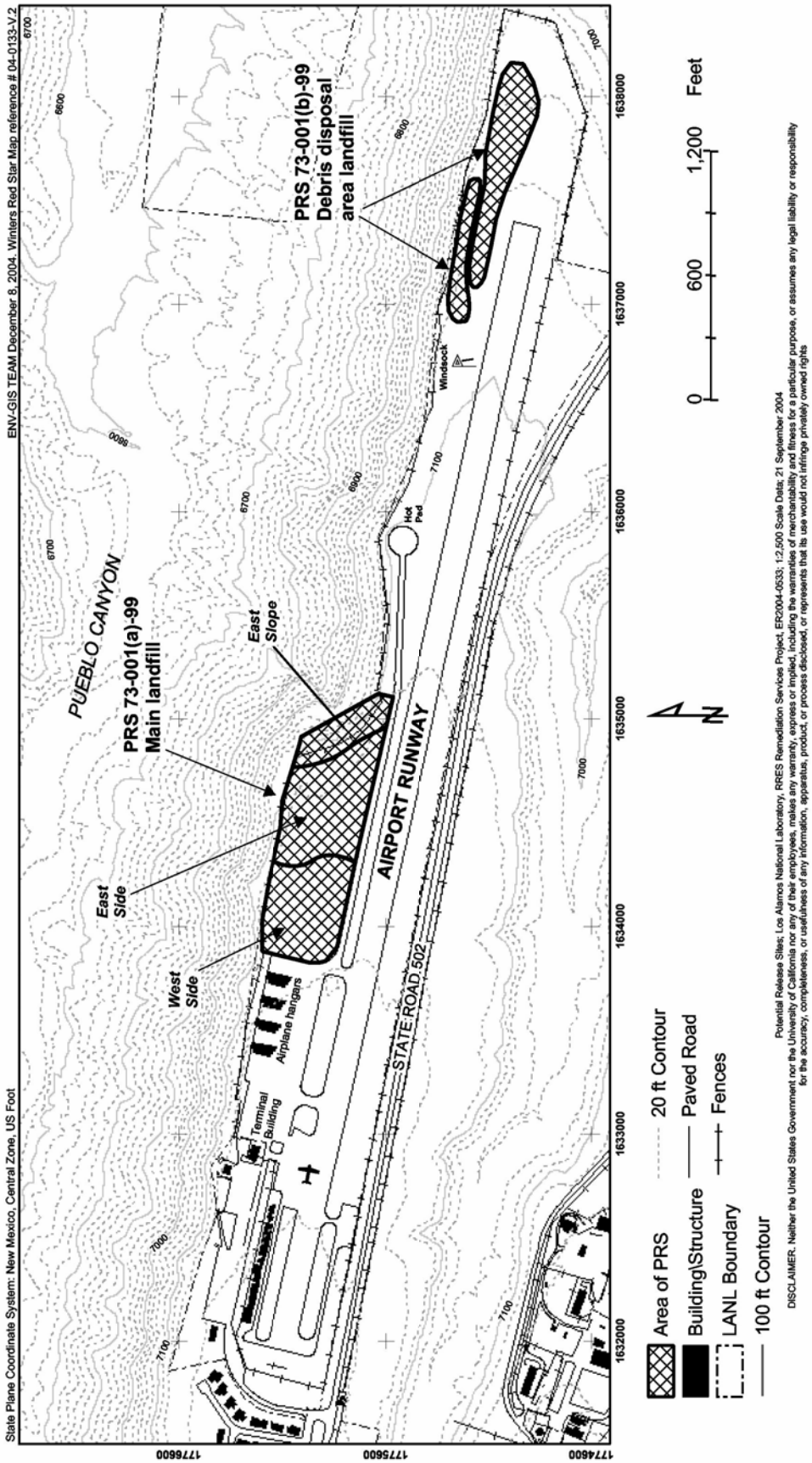

Figure 2. Landfill Locations at the Los Alamos Airport.

The DDA was used from 1984 to 1986 to bury burned debris excavated from the western portion of the main landfill (LANL 1990). This material was excavated and replaced with clean fill to prepare the western portion of the landfill for constructing airplane hangars and tie-down areas. Since the wastes placed in the DDA came from the main landfill, both areas contain similar types of material. In 1986, the DDA was covered with soil and hydro-seeded (LANL 1990). A voluntary corrective action conducted by NNSA in 2003 removed trash and other debris associated with the main landfill from the ravines extending from the natural depression to the floor of Pueblo Canyon. A total waste volume of 430 yd^3 (327 m^3) consisting of rubber tires, steel, and miscellaneous debris was removed with a crane and hauled to the Los Alamos County landfill for recycling (LANL 2004a).

1.7 Overview of Contamination

The LANL Environmental Restoration Project conducted an RFI for the Airport Landfill areas (LANL 1998a) between 1994 and 1997. The RFI focused on defining the nature and extent of potential contamination to determine an appropriate plan for corrective action. RFI activities included site surveys, radiological surveys, infrared photography surveys, geophysical surveys, geomorphologic mapping, geodetic surveys to document trenching and sampling locations, and collection of samples. Field activities included sampling of soil gas, surface soil and sediment, subsurface soil and tuff, pore water, and leachate; interior and perimeter borehole drilling; cone penetrometer testing (for soil compaction); and monitoring well installation. Analysis of samples collected at the landfill indicated the presence of organic and inorganic chemicals. The types of chemicals and concentrations observed are typical of those reported for most other municipal landfills. The primary compounds detected in the soil gas samples included methane, trichloroethene, tetrachloroethene, and vinyl chloride. The RFI report recommended leaving the waste in place and installing an engineered cover (LANL 1998a).

1.8 Public Involvement

NNSA provided written notification of the preparation of this EA for the closure of the Airport Landfills to the State of New Mexico, the four Accord Pueblos (San Ildefonso, Santa Clara, Jemez, and Cochiti), Acoma Pueblo, the Mescalero Apache Tribe, and to approximately 70 stakeholders on December 1, 2004.

DOE/NNSA held a series of meetings with representatives of the public including Los Alamos County, NMED, Ross Aviation, Federal Aviation Administration (FAA), New Mexico Department of Transportation (Aviation Division), Aircraft Owners and Pilots Association, and the Los Alamos Aircraft Association to address concerns of the public and to discuss possible corrective measure alternatives so that potential expansion of the Airport would be possible.

In addition to these stakeholder meetings, a public scoping meeting and site tour were held at the Los Alamos Airport on December 16, 2004. In general, the statements made during the public scoping meeting involved issues that are outside the regulatory authority of NEPA.

On April 4, 2005, the draft EA was distributed for a 15-day public comment ending April 19, 2005. Comments received were categorized in the following areas:

- Duration of the corrective measure
- Administrative authority
- Environmental Justice

Where appropriate and to the extent practicable, concerns and comments were incorporated into the final EA. These changes are highlighted in the final document by the addition of a sidebar in the margin of the text.

On May 2, 2005, an informational meeting was held for the public at the Los Alamos Airport. The purpose of the meeting was to provide an update on the NEPA review and comments on the draft EA and to present the recommended remedial alternative to interested parties.

1.9 Purpose and Need for Agency Action

On November 26, 1997, Congress passed PL 105-119 (42 USC 2391). Section 632 of this Act directed the Secretary of Energy to convey to the Incorporated County of Los Alamos, New Mexico, or to the designee of the County, and transfer to the Secretary of the Interior, in trust for the Pueblo of San Ildefonso, parcels of land under the jurisdictional administrative control of DOE at or in the vicinity of LANL. Such parcels, or tracts, of land must meet suitability criteria established by the Act.

The Act sets forth the criteria, processes, and dates by which the tracts will be selected, titles to the tracts reviewed, environmental issues evaluated, and decisions made as to the allocation of the tracts between the two recipients. DOE's responsibilities under the Act included identifying potentially suitable tracts of land, identifying any environmental restoration and remediation that would be needed for those tracts of land, and conducting NEPA review of the proposed conveyance or transfer of the land tracts.

Under this Act, those land parcels identified suitable for conveyance and transfer must have undergone any necessary environmental restoration or remediation. Therefore, DOE needs to remediate the landfills identified on this Airport Landfills Tract in order to satisfy the intent of Congress and meet the requirements of Section 632 of the Act (42 USC 2391).

2.0 Description of Alternatives

This section discusses three corrective measure alternatives that would allow NNSA to meet its purpose and need for transferring the proposed Airport Landfills to Los Alamos County and a No Action Alternative. Section 2.1 describes the Alternatives. Section 2.2 describes the No Action Alternative as a baseline for comparison with the consequences of implementing a corrective measure at the Airport Landfills. Section 2.3 presents other options considered. Section 2.4 discusses related actions.

Because the Airport Landfills RFI Report (LANL 1998a) identified no unacceptable present-day risks to human health or the environment, the reason for conducting a VCM at the Airport Landfills is two-fold: (1) to prevent future releases to the environment that might create unacceptable risks to human health or the environment and (2) to remediate the proposed airport land parcel prior to transfer to Los Alamos County in accordance with PL 105-119. Thus, the proposed corrective measure alternatives emphasize controlling the sources that could contribute to releases, either by containment, excavation, or a combination of the two such that the magnitude of potential future releases would be within acceptable risk levels. The design of corrective measures involving ground covers is to prevent the downward migration of water into the landfill material. The lifespan of this type of corrective measures relies in the proper care and maintenance to the cover, either asphalt or earthen.

Corrective measure alternatives analyzed in this EA address a range of potential containment and excavation options and are intended to be representative of corrective measures that could be implemented at the Airport Landfills. This EA analyzes the potential environmental consequences of implementing corrective measures consistent with RCRA requirements, EPA guidance, the HSWA permitting process, DOE policy, and other applicable regulations. In accordance with HSWA requirements, corrective measure alternatives selected for this analysis are based on the information developed in the RFI and are intended to provide a bounding analysis of the potential environmental effects of implementing any corrective measure at the airport lands.

2.1 Alternatives

This section describes three alternatives that meet the purpose and need for conducting a VCM prior to transferring the Airport Landfills to Los Alamos County and a No Action Alternative (Table 1). In this EA, NNSA takes a hard look at three remedial alternatives that provide for a reasonable range of alternatives in the language and spirit of NEPA. Their analyses encompass the several options and combinations of options considered by interested parties during several scoping meetings as discussed in Section 1.7. The fourth alternative is not to perform any remediation, thus no action. The No Action Alternative is required by law and must be considered even if NNSA is under court order or legislative command to act (10 CFR 1021.31[3]).

General Measures

Work at the Airport Landfills for any of the three corrective measure alternatives could require the use of heavy equipment such as dozers, cement trucks, dump trucks, a water truck, dragline, compactors, excavators, scrapers, front-end loaders, backhoes, haul trucks bringing material on site, and asphalt lay down equipment. Equipment would operate primarily during the daylight hours and would be left onsite over night. Lighting would be confined to the site and any lights used during the construction

Table 1. Remediation Alternatives

Recommended Alternative 1: Leave waste in place; install MatCon™ cover and retaining wall at main landfill; install evapotranspiration[6] (ET) cover over DDA
Alternative 2: Leave waste in place at main landfill and install MatCon™ cover; remove waste from east slope to DDA and install ET cover over DDA
Alternative 3: Excavate main landfill, haul waste offsite, backfill excavated area; install asphalt cover over backfilled site; install ET cover over DDA
Alternative 4: Do nothing (No Action)

of the project would be directed away from the canyon. During site activities, space in the immediate vicinity would be required for vehicle parking, equipment storage, and material staging. Existing site controls (such as fencing) would limit unauthorized public access.

The proposed action area is within the Pueblo Canyon Mexican spotted owl Area of Environmental Interest (AEI) core and buffer zones. As a result, corrective measure activities may remove or disturb potentially suitable Mexican spotted owl habitat. If the project actions are delayed until the start of the 2005 breeding season (March 1 – August 31), surveys would be performed prior to the start of work and follow-up notification would be given to the U. S. Fish and Wildlife Service (USFWS) to determine if formal consultation under the *Endangered Species Act* (ESA) would be necessary.

Before the start of any construction activity, underground utilities would be identified and flagged. Construction trailers, if required for use by site workers, would be placed within a staging area located near the airport work site. The staging area for heavy equipment, vehicles, and construction trailers would utilize the tie-down area at the northeast area of the existing asphalt surface of the airport. Utilities would be made available to the construction site by hooking up to the existing air-side water and electric utilities. Office waste generated by site workers would be disposed of at the county landfill or its replacement facility.

All construction activities would conform to FAA safety guidelines. One such guideline is the Advisory Circular, *Operational Safety on Airports During Construction, 150/5370-2E*. Basically, this FAA circular lays out guidelines for construction operations and provides guidance for safe ground vehicle operations and pedestrian control to minimize disruption of normal aircraft operations and to avoid situations that could be hazardous. An airport safety plan and construction vehicle plan would be developed for the Los Alamos Airport before the implementation of any corrective measure alternative. Construction contractors and subcontractors would undergo safety training for operating within an airport boundary. Construction vehicles and equipment movement would be restricted to construction areas by flagging and barricading or providing escorts where appropriate. During construction activities, construction workers would monitor the runway and taxiways for foreign objects and debris and would immediately remove all foreign objects and debris generated by construction activities. Construction employees would be prohibited from entering any part of the air

[6] ET is the combined discharge of water from the earth's surface to the atmosphere by evaporation from lakes, streams, and soil surfaces, and by transpiration (giving off water vapor) from plants.

Safety Hazards and Impacts

The situations identified below are potentially hazardous conditions that may occur during airport construction projects. Safety area encroachments, unauthorized and improper ground vehicle operations, and unmarked or uncovered holes and trenches near aircraft operating surfaces pose the most prevalent threats to airport operational safety during airport construction projects. Airport operators and contractors should consider the following when performing inspections of construction activity:

- Excavation adjacent to runways, taxiways, and aprons.
- Mounds of earth, construction materials, temporary structures, and other obstacles near any open runway, taxiway, or taxilane; in the related object-free area and aircraft approach or departure areas/zones; or obstructing any sign or marking.
- Heavy equipment (stationary or mobile) operating or idle near air operations areas (AOAs), in runway approaches and departures areas, or in object free zones (OFZs).
- Equipment or material near navigation aids that may degrade or impair radiated signals and/or the monitoring of navigational and visual aids. Unauthorized or improper vehicle operations in localizer or glide slope critical areas, resulting in electronic interference and/or facility shutdown.
- Tall and especially relatively low-visibility units (i.e., equipment with slim profiles)—cranes, drills, and similar objects—located in critical areas, such as OFZs and approach zones.
- Improperly positioned or malfunctioning lights or unlighted airport hazards, such as holes or excavations, on any apron, open taxiway, or open taxilane or in a related safety, approach, or departure area.
- Construction work taking place outside of designated work areas and out of phase.
- Obstacles, loose pavement, trash, and other debris on or near AOAs. Construction debris (gravel, sand, mud, paving materials, etc.) on airport pavements may result in aircraft propeller, turbine engine, or tire damage. Also, loose materials may blow about, potentially causing personal injury or equipment damage.
- Inappropriate or poorly maintained fencing during construction intended to deter human and animal intrusions into the AOA. Fencing and other markings that are inadequate to separate construction areas from open AOAs create aviation hazards.
- Wildlife attractants—such as trash (food scraps not collected from construction personnel activity), grass seeds, or ponded water—on or near airports.
- Misleading or malfunctioning obstruction lights. Unlighted or unmarked obstructions in the approach to any open runway pose aviation hazards.
- Failure to issue, update, or cancel notices to airmen about airport or runway closures or other construction-related airport conditions.
- Lack of radio communications with construction vehicles in airport movement areas.
- Objects, regardless of whether they are marked or flagged, or activities anywhere on or near an airport that could be distracting, confusing, or alarming to pilots during aircraft operations.
- Spillage from vehicles (gasoline, diesel fuel, oil, etc.) on active pavement areas, such as runways, taxiways, ramps, and airport roadways.
- Failure to maintain drainage system integrity during construction (e.g., no temporary drainage provided when working on a drainage system).
- Failure to control dust; consider limiting the amount of area from which the contractor is allowed to strip turf.

operations areas. Training of contractors on proper communication procedures would be provided to maintain airport operational safety. The airport operator would provide notices to airmen on hazardous conditions on airport movement areas. Stockpiled materials and equipment would not be permitted within the runway safety area or object-free area of an operational runway. The contractor would provide a safety officer or construction inspector familiar with airport safety and knowledgeable of hazards to monitor construction activities.

Site activities at the Airport Landfills have the potential to generate dust. Standard dust suppression methods would be used onsite to minimize the generation of dust during site activities; such methods could include water spraying or the use of other types of dust-suppression materials such as periodically spraying with liquid stabilizers ("tackifiers[7]") to suppress dust emission. New Mexico Ambient Air Quality Standards and the National Ambient Air Quality Standards (NAAQS) for total suspended particulate emissions would be met throughout any corrective measure activities.

Site work would be planned and managed to ensure standard worker safety goals are met and work would be performed in accordance with good management practices, regulations promulgated by the Occupational Safety and Health Administration, and applicable DOE orders involving worker, site safety practices, and FAA safety guidelines. Onsite workers would park their personal vehicles either in existing parking lots nearby or in other designated parking areas at the airport. All site construction contractors would be required to submit and adhere to a Construction Health and Safety Plan. Applicable safety and health training and monitoring, personal protective equipment (PPE), and work-site hazard controls would be required for workers at the Airport Landfills. A staff level of about 10 to 50 workers would be actively involved in potentially hazardous activities such as heavy equipment operations, soil excavations, and the handling and assembling of various building materials depending on the final alternative chosen and the overall sequencing of construction. Appropriate personal protection programs would be a routine part of the construction activities and would involve the use of such PPE as gloves, hard hats, hard-toed boots, eye protection, and hearing protection. Site corrective measure implementation activities could begin as early as 2005 and take at least 12 months to complete, depending on the alternative chosen.

Best management practices (BMPs) for soil erosion control purposes would be implemented, as necessary, for any site remediation activities involving soil disturbance. BMPs could include run-on and run-off controls, such as silt fencing, ditching, drainage channels and check dams, sediment traps, inlet filters, culverts, berms, and similar storm water flow controls. Surface water run-on controls have been planned and are currently being implemented, as a result of the development of the LANL RFI Report for the Airport Landfills to minimize future erosion and the infiltration of water into the landfill areas (LANL 1998a). These steps would substantially enhance the stability of the landfill, serve to further reduce the formation of landfill gases, and minimize infiltration by controlling storm water runoff.

A Storm Water Pollution Prevention Plan would be required for the construction activity and would coordinate with the airport's storm water plan. Storm water protection measures would be put in place to protect canyons and the surrounding mesa from uncontrolled run-off and erosion. Disturbed

[7] Tackifiers are chemical dust suppressants often added to water that act to disperse the chemicals, then evaporate after application. The chemicals that are left behind bind the soil particles together into larger particles that are less easily blown in the air.

soils would be stabilized during and after construction to prevent erosion. All exposed soils would be revegetated with native plants as soon as feasible after construction to minimize erosion. No trees with a diameter greater than 8 inches (in.) (20 centimeters [cm]) would be removed from the area without LANL Ecology Group evaluation and none greater than 8 in. (20 cm) removed from the Mexican spotted owl AEI.

Under all alternatives, the corrective measure implemented at the main landfill would not involve the construction of a berm that could potentially result in a safety hazard to air traffic. Additionally, under all alternatives, the corrective measure implemented at the existing DDA would be the same. NMED has already approved an ET cover for the existing DDA. ET covers have been demonstrated to be reliable because they use "natural" climatic and vegetation ET conditions at the site to minimize downward water movement. The proposed ET cover would be a multilayered system and would seek to minimize percolation through the refuse by maximizing the ET processes in the soil. The new ET cover could be easily maintained by adding more topsoil and gravel mixture to areas that settle or erode over time. An ET cover would be easily constructed from common construction materials that are readily available. A vegetative cover could be established within two years.

Implementation of any corrective measure would allow NNSA to transfer the Airport land tract to Los Alamos County and under RCRA the County would be able to develop the site of the current landfills. Future expansion related to airport activities would involve negotiations between the FAA, NNSA/LASO, and Los Alamos County through the real property process.

2.1.1 Alternative 1, MatCon™ Cover and Retaining Wall

Alternative 1 is to leave the waste in place at the main landfill and install a MatCon™ cover and retaining wall (Figure 3). An ET cover would be designed and installed over the DDA located about 2,500 ft (750 m) southeast of the main landfill. This alternative was discussed with the public during the December 16, 2004, scoping meeting at Los Alamos Airport and has the acceptance of Los Alamos County and the pilots' association and will be recommended by DOE for implementation to the State of New Mexico.

The MatCon™ (**M**odified **A**sphalt **T**echnology for Waste **Con**tainment) system is an advanced modified asphalt technology that combines a proprietary binder with tightly specified aggregates. MatCon™ Hot Mix Asphalt is a well-suited material for environmental capping and containment applications. The permeability of a MatCon™ cover is lower than that required under RCRA, and also offers resilience and longevity. The cover is designed to shed water and prevent infiltration into the waste. MatCon™ has the ability to perform within a wide range of temperatures and loadings by resisting deformation under extremes of these parameters. A monitoring and sub-surface water collection system may be installed if approved by the State based on the final design plan.

This alternative consists of designing a landfill cover, such that the west and east sides of the main landfill are covered with a MatCon™ surface layer that would serve as an extension of the existing Los Alamos Airport tarmac. This alternative would not include installation of any berm. The MatCon™ surface layer would meet all strength requirements of the Los Alamos Airport and would also meet all landfill cover requirements of NMED. A gas venting layer or gravel layer would be constructed on top of the landfill sub-grade, followed by the MatCon™ asphalt cover layer with 0.5 percent to 2 percent slopes that tie into the existing tarmac. Landfill gases would be collected in

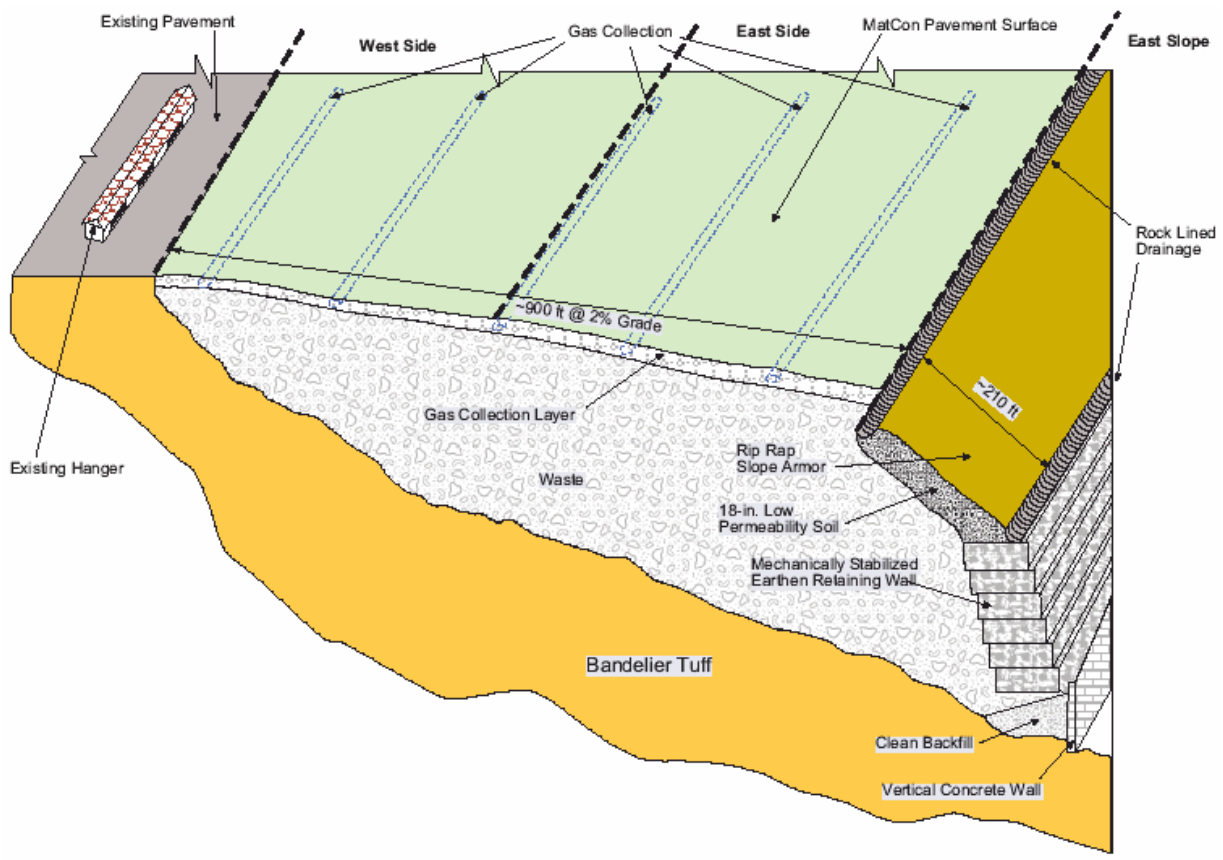

Figure 3. Alternative 1, MatCon™ Cover and Retaining Wall.

manifolded PVC piping connected to risers that extend above the paved surfaces. The risers would be fitted to the hangar posts in the hangar area. The vent risers would be capped with spinners to vent passively to the atmosphere.

The final MatCon™ surface would be constructed so as to meet all run-on and run-off surface-water requirements and minimize any downward movement of leachate and condensate. A concrete, mechanically stabilized earth (MSE) retention wall would be built on the east slope to allow for placement of municipal waste removed from the existing north and east faces of the landfill. A dragline would be used on the north and east slopes to achieve the 3H:1V (3 ft [0.9 m] horizontal for every foot [0.3 m] of vertical rise) slope requirements of NMED. Wastes behind the retention wall would be compacted and covered to meet NMED landfill cover requirements. Implementation of this corrective measure alternative would take about 12 months to implement and would cost about $5,200,000.

2.1.2 Alternative 2, MatCon™ Cover and Rock Armor

Alternative 2 would include removal of waste from the east slope of the main landfill to the existing DDA (Figure 4). This alternative would involve 1) installation of a MatCon™ cover on the west side of the main landfill; 2) installation of a MatCon™ cover on the east side; and 3) placement of a soil

Figure 4. Alternative 2, MatCon™ Cover and Rock Armor.

and rock armor cover on the east slope. Water and gas collection would be the same as described for Alternative 1. This alternative would not include installation of any berm. An ET cover would be designed and installed over the DDA located about 2,500 ft (750 m) southeast of the main landfill. Implementation of Alternative 2 would not require off-site disposal of excavated wastes.

Slopes at the main landfill are excessively steep, especially at the east end, and exceed the slope recommended by NMED requirements for landfill covers. NMED has granted approval of 3H:1V final cover slopes based on a site-specific demonstration of slope stability. Because of the landfill constraints (steep slopes to the north and east, the taxiway, the airplane tie-downs, and the runway to the south and west), it would not be feasible to expand the boundaries of the landfill to flatten the side

slopes. The waste would have to be pulled back up the slope with a dragline onto the top surface to reduce the slopes along the north and east without expanding the waste footprint of the main landfill. For this reason, the new cover design would involve relocating excavated waste from the east slope to the DDA and would not include expanding the waste footprint of the main landfill.

Implementation of this alternative would include the excavation of about 44,000 tons (31,680 yd^3 [24,077 m^3]) of waste from the east slope of the main landfill. Removal of this volume of material would be necessary for the proposed installation of MatCon™ covers on the west and east sides and to

obtain the required slope for a rock armor cover on the east slope. Waste excavated from the main landfill would be transported to the existing DDA located about 2,500 ft (750 m) to the southeast of the main landfill. The existing DDA soil cover would be removed to accommodate the 44,000 tons (31,680 yd^3 [24,077 m^3]) of waste from the main landfill. When this volume has been disposed of in the DDA, a new ET cover would be installed over the DDA. Implementation of this corrective measure alternative would take about 12 months to complete and would cost about $4,000,000.

2.1.3 Alternative 3, Complete Excavation of the Main Landfill

Alternative 3 would be to implement complete excavation of all wastes from the main landfill followed by offsite disposal of the waste inventory. Waste from the west side, east side, and the east slope would be completely excavated and the resulting excavated area would be backfilled with clean fill and covered with an asphalt cover. This alternative would not include installation of any berm. An ET cover would be designed and installed over the DDA located about 2,500 ft (750 m) southeast of the main landfill. Complete excavation would result in a disposal volume of about 945,000 tons (680,400 yd^3 [517,104 m^3]) of waste to be disposed of at a licensed solid waste landfill.

Waste shipped offsite would be packaged to meet U.S. Department of Transportation shipping requirements before shipment and disposal could occur. All waste requiring offsite disposal would be transported via SR 502 to Trinity Drive, across the bridge to East Jemez Road (the Truck Route) and on to New Mexico public highways. Truck traffic would be restricted to the daylight hours between 9:30 AM and 3:30 PM. It is estimated that a total volume of about 680,400 yd^3 (517,104 m^3) of excavated material would be removed and hauled out of the main landfill.

The information and descriptions provided for Alternative 3 are based on conceptual designs for the excavation and removal activities. It is expected that implementation of this corrective measure alternative would not generate any regulated waste. Incidental waste that might be generated during cover construction activities would probably consist of municipal or industrial solid waste. Waste that might be generated during cover construction activities would be either recycled or disposed of at an appropriate facility.

Many of the activities of Alternative 3 would have to be conducted outside the primary waste management area of the Airport Landfills. Access to the landfills is controlled by a perimeter fence around the entire airport. Access to the tarmac is limited to private aircraft owners, operators, passengers, and other authorized personnel. An ET cover would be designed and installed over the DDA located about 2,500 ft (750 m) southeast of the main landfill. The time to design, implement, and complete Alternative 3 is discussed in Section 3.3.4 and is estimated to cost about $30,400,000. This price does not include the cost associated with management of hazardous waste that might be encountered during landfill excavation.

2.2 No Action

The No Action Alternative, which in this case would be a continuation of the status quo, provides a description of current conditions to compare to the potential effects of the proposed action. The No Action Alternative is required by NEPA and must be considered even if NNSA is under a court order or legislative command to act (10 CFR 1021.31[c]).

Under the No Action Alternative, none of the corrective measure alternatives described in Section 2.1 would be undertaken at this site. Enhanced erosion controls to limit direct exposure of the waste and further minimize surface transport of contaminants would not be implemented. There would be a continuing potential for contaminant mobilization due to biotic intrusion of deep-rooting plants and burrowing animals and, potentially, human intrusion. Landfill gas that may contain hazardous volatile organic compounds would continue to vent until all vapors were vented to the atmosphere, were bioconverted or decayed, or were diluted over time.

2.3 Other Options Considered

Seven corrective measure options (including the three alternatives previously discussed in Section 2.1) and their combinations have been studied by DOE/NNSA, Los Alamos County, New Mexico Department of Transportation, and the FAA and could be recommended to the State as a VCM.

Table 2. Other Options Considered for Corrective Measure Alternatives

Options	West side (airport expansion area)	East side	East slope	Disposal
Existing condition	RCRA Subtitle D[1] soil cover	RCRA Subtitle D soil cover	Soil; rock armor cover	None required
Partial waste removal; soil cover	Remove waste and backfill; asphalt cover	RCRA Subtitle D soil cover	Soil; rock armor cover	200,000 tons to licensed solid waste landfill
Partial waste removal; soil cover and retaining wall	Remove waste and backfill; asphalt cover	RCRA Subtitle D soil cover	Concrete; MSE retaining wall	160,000 tons to licensed solid waste landfill
MatCon™; soil cover	MatCon™ cover	RCRA Subtitle D soil cover	Concrete; MSE retaining wall	None required

[1]Subtitle D soil cover refers to the RCRA requirements for closure of a solid waste landfill.

2.4 Related Actions

2.4.1 Final Environmental Impact Statement for the Conveyance and Transfer of Certain Land Tracts Administered by the U.S. Department of Energy and Located at Los Alamos National Laboratory

The Final Conveyance and Transfer EIS (DOE 1999a) was issued in October 1999. A Record of Decision (ROD) (DOE 2000a) was issued in March 2000 and amended in June 2002 (DOE 2000b). The Conveyance and Transfer EIS discussed the DOE's role in the conveyance and transfer of 10 land parcels at LANL to the incorporated County of Los Alamos or conveyance to the Bureau of Indian Affairs in trust for the Pueblo of San Ildefonso under PL 105-119 and the agreement signed by the parties. The review of environmental impacts of the conveyance and transfer of each parcel, as required by the Act, is the subject of the Conveyance and Transfer EIS. Section 11.0 of the Conveyance and Transfer EIS discusses the Airport Tract specifically and analyzes the environmental consequences of transferring this parcel of land.

2.4.2 Final Site-Wide Environmental Impact Statement for the Continued Operation of the Los Alamos National Laboratory (SWEIS)

The Final LANL SWEIS (DOE 1999b) was issued early in 1999. A ROD (DOE 1999c) was issued in September 1999, and a Mitigation Action Plan was issued in October 1999 (DOE 1999d). The SWEIS explained that environmental restoration at LANL was being performed by a LANL organization established by DOE in 1989 to assess and remediate potentially contaminated sites that either were or still are under LANL control. In addition, the SWEIS (p. 2-9) includes the information that in 1996, the DOE Office of Environmental Management (EM) initiated a complex-wide strategy to accelerate site cleanup and enhance performance of the cleanup program. The report *Accelerating Cleanup: Paths to Closure* (DOE 1998b) (previously known as "2006 Plan") includes input from all major field sites, including LANL, to support EM's program planning process.

The SWEIS (5-78) (vol. III, app. F, section F.6.6) included an analysis of impacts for specific waste management operations and transportation impacts of the various SWEIS alternatives at levels that were greater than are currently being forecast as needed in the foreseeable future. The analysis of these three corrective measure alternatives considered in this EA is therefore bounded by the analysis of LANL operations in the SWEIS. This EA tiers from the SWEIS and a reanalysis of LANL operations per se will not be provided in this EA. Any points of difference from the effects attributed to the remediation of the Airport Landfills will, however, be included in the Section 4 analysis of effects within this EA.

3.0 Affected Environment and Environmental Consequences

Section 3.0 describes the natural and human environment that could be affected by the proposed corrective measure alternatives and the No Action Alternative. Based on the corrective measure descriptions, environmental resources that may potentially be affected as a result of implementing any corrective measure have been considered. Environmental issues were identified and either addressed in this section or not, based on the "Sliding Scale Approach".[8] Table 3 identifies the subsection where potential environmental issues are discussed or notes why they are not addressed in this document.

Table 3. Potential Environmental Issues Applicable to This EA

Environmental Category	Applicability	Subsection
Land Use	Yes	3.2
Traffic and Transportation	Yes	3.3
Ecological Resources	Yes	3.4
Noise	Yes	3.5
Water Resources (Ground and Surface)	Yes	3.6
Air Quality	Yes	3.7
Human Health	Yes	3.8
Environmental Justice	Yes	3.9
Geology	No. No major surface faulting is evident in this tract.	N/A
Utilities and Infrastructure	No. There would be no effect to utilities consumption or infrastructure resources. Utilities would be made temporarily available to the construction site by hooking up to the existing airport water and electric utilities.	N/A
Floodplains and Wetlands	No. The proposed activities would not be located in a floodplain or a wetland, so these resources would not be affected.	N/A
Cultural Resources	No. There are no known archaeological or historic resources within the area of the proposed action, so no known cultural resources would be affected.	N/A
Socioeconomic	No. Demolition and construction activities would employ only 50 new workers at the peak activity of the complete excavation alternative and would have little noticeable effect on local economy.	N/A
Visual Resources	No. All alternatives involve only local construction in an existing industrial area. No construction would result in buildings higher or more visible than the existing buildings.	N/A

[8] A sliding-scale approach (DOE 1993) is the basis for the analysis of potential environmental and socioeconomic effects in this EA. That is, certain aspects of the project activity have a greater potential for creating environmental effects than others; therefore, they are discussed in greater detail in this EA than those aspects of the action that have little potential for effect.

3.1 Regional Setting

The proposed activities would be located within the area of Los Alamos County that includes LANL. LANL comprises a large portion of Los Alamos County and extends into Santa Fe County. LANL is situated on the Pajarito Plateau along the eastern flank of the Jemez Mountains and consists of 49 technical areas. The Pajarito Plateau slopes downward towards the Rio Grande along the eastern edge of LANL and contains several fingerlike mesa tops separated by relatively narrow and deep canyons.

Commercial and residential development in Los Alamos County is confined primarily to several mesa tops lying north of the core LANL development, in the case of the Los Alamos town site, or southeast, in the case of the community of White Rock. The lands surrounding Los Alamos County are largely undeveloped wooded areas that are administered by the U.S. Department of Agriculture, Santa Fe National Forest; the U.S. Department of the Interior, National Park Service, Bandelier National Monument; the U.S. Department of the Interior, Bureau of Land Management; and San Ildefonso Pueblo.

3.2 Land Use

3.2.1 Affected Environment

A complete description of the Airport Landfills has been provided in Section 1.5 of the EA. The Airport Landfills occupy the mesa top adjacent to and above Pueblo Canyon. The vegetation of the tract, covering about 60 percent of the land area, is primarily ponderosa pine forest; piñon-juniper woodland; and open shrub, grassland, and wildflower areas. The remaining 40 percent of the area is developed as roadway, parking lots, runway, and buildings. The airport handles both commercial and private air transportation, as well as emergency transport and support (for example, medical and fire response). In addition to the terminal building, vehicle parking area and taxiway, the airport provides both hangars and tie-downs, aircraft parking facilities, transient tie-down aircraft parking facilities, aircraft maintenance services, self-serve fuel, aircraft and car rental.

3.2.2 Alternative 1, MatCon™ Cover and Retaining Wall

Implementation of Alternative 1 would meet DOE's need to remediate the landfill identified on this Airport Landfills Tract. Remediation of the landfill would render this tract suitable for transfer to Los Alamos County and would satisfy the intent of Congress and meet the requirements of Section 632 of PL 105-119. There would be little anticipated change in land uses. The airport would continue to dominate land use as a public airport to the north of SR 502 (DOE 1999a). Implementation of any corrective measure option at the Airport landfills would allow for the future contemplated use of this land for expansion of the existing Los Alamos Airport or any other kind of future development.

3.2.3 Alternative 2, MatCon™ Cover and Rock Armor

There would be little anticipated change in land uses. Implementation of Alternative 2 would have the same effects as described for Alternative 1. Remediation of the landfill would prepare the tract for transfer to Los Alamos County and would satisfy the intent of PL 105-119. The airport would continue to be the dominant land user (DOE 1999a).

3.2.4 Alternative 3, Complete Excavation of the Main Landfill

There would be little anticipated change in land uses. Implementation of Alternative 3 would have the same effects as described above. The airport would continue to dominate land use as a public airport (DOE 1999a). Remediation of the landfill would render this tract suitable for transfer to Los Alamos County under the requirements of Section 632 of PL 105-119. However, as discussed in Section 3.3.4, implementation of this alternative could take about five years to accomplish. The Airport Landfills must be transferred by 2007 as discussed in Section 1.9 unless Los Alamos County petitions Congress for an extension of the transfer deadline.

3.2.5 No Action Alternative

Under the No Action Alternative, there would be no corrective measure actions taken at the main landfill. The Airport Tract would not be suitable for conveyance or transfer. DOE would not satisfy the intent of Congress and meet the requirements of Section 632 of PL 105-119.

3.3 Traffic and Transportation

3.3.1 Affected Environment

Regional and site transportation routes are the primary methods used to transport LANL-affiliated employees, commercial shipments, and also hazardous and radioactive material shipments. Los Alamos County peak period traffic volumes and resulting congestion are greatly influenced by: 1) LANL (since it is the main employer in Los Alamos County); 2) constraints of the existing roadway network; 3) the topography of the Pajarito Plateau; and 4) access restrictions related to LANL operations and security. LANL has a number of roads that allow public access. However, since DOE controls the entire area within LANL's boundaries, DOE has the option to restrict traffic on LANL roadways. There are four main access points to LANL that convey about 41,000 average daily work trips (Table 4). In addition, traffic counts taken in 2004 showed that there were 16,154 average daily trips passing by on East Road just west of the airport. This includes 1,402 trips westbound during the morning peak commute from 7:15 to 8:15 and 1,324 trips eastbound during the evening peak commute between 3:30 and 4:30 (Trask 2005).

Table 4. LANL Main Access Points

Location	Average Daily Vehicle Trips
Diamond Drive Across North of Los Alamos Canyon Bridge	24,545
Pajarito Road at White Rock Access Control Station	4,984
East Jemez Road west of the SR 4 intersection	9,502
West Jemez Road north of SR 4 intersection	2,010
Total	41,041

Source: KSL File # 205.005.01. February 16, 2004 - provided by LANL Traffic Engineer Charles Trask

The Los Alamos Airport is adjacent to East Road, which changes designation from SR 502, a two-lane State highway entering Los Alamos town site from the east. Current capacity of this road is about 2,200 passenger cars per hour. The Airport Tract within TA-73 is accessed only from SR 502,

also called the Front Hill Road. SR 502 links to SR 4, which is the only way from Los Alamos to the Española Valley, Santa Fe, the Santa Fe bypass, and Interstate 25. SR 502 is also called East Road west of Airport Road and Trinity Drive in downtown Los Alamos. East Road and Trinity Drive are both SR 502 from the County line to Diamond Drive and serve as the community's commercial arterial route. Truck traffic going into Los Alamos town site and to LANL is expected to use East Jemez Road (the Truck Route). LANL-bound trucks must stop at the current truck inspection station at the SR 4 intersection. East Jemez Road avoids the steep incline on SR 502 between the White Rock "Y" and the town site, enhancing safety and allowing the flow of faster-moving automobile traffic into town.

East Jemez Road lies within LANL and is under NNSA control. It serves as the primary access road between LANL and White Rock, and between LANL and points east. It also is the designated Waste Isolation Pilot Plant shipment route. As part of the Security Perimeter Project, an access control station will be built on East Jemez Road close to Diamond Drive to screen all vehicles entering LANL. Improvements to the substandard Trinity Drive and DP Road intersection are in the planning stage, and will be performed by the State Transportation Department. There are no sidewalks or improved bicycle lanes along East Jemez Road or SR 502, east of Airport Road. There are sidewalks along East Road to the west of Airport Road. Los Alamos County has proposed improving a trail along the south side of SR 502 that would connect the existing Anniversary Trail with trails along the Los Alamos Canyon rim.

3.3.2 Alternative 1, MatCon™ Cover and Retaining Wall

Implementing this alternative would not appreciably affect area traffic because the additional vehicle trips would be a negligible increase on East Jemez Road and connecting roads. Truck traffic would be restricted to the daylight hours between 9:30 AM and 3:30 PM.

Under Alternative 1, there would be no waste removal from the Airport Landfills. No truck trips would be required to haul excavated waste materials offsite. In the short term (about a 12-month period), construction vehicles would be used for hauling in materials needed for installation of the MatCon™ cover. It is estimated that about 11,500 tons of gravel and 10,000 tons of MatCon™ would be required for implementation of this alternative. A standard dump truck typically hauls about 15 tons; a belly-dump trailer with more axles can haul about 20 to 25 tons. Hauling in both materials would require about 1,400 loads using a standard dump truck; about 1,100 loads using a belly-dump trailer over a 12-month period; on average, about 4 to 5 truck trips per day (for a 6-day work week) depending on the size of the hauler (in addition to an equal number of trips with empty haulers). The addition of about 8 to 10 truck trips per day to the current volume of about 24,600 vehicle trips on Diamond Drive and about 9,500 vehicle trips on East Jemez Road would have a negligible effect on traffic in the area.

Implementing Alternative 1 would also require importing some smaller quantities of concrete for the retaining wall and other construction materials. These are not included in the imported material total, but would require minimal additional trips. Peak staffing is estimated to be 10 to 14 workers. Parking would be provided for these vehicles near the project in a manner that would minimize effects on any natural and cultural resources.

3.3.3 Alternative 2, MatCon™ Cover and Rock Armor

Implementing this alternative would not appreciably affect area traffic because the additional vehicle trips would be a negligible increase on East Jemez Road and connecting roads. Truck traffic would be restricted to the daylight hours between 9:30 AM and 3:30 PM. Implementation of this alternative would require installation of the MatCon™ cover as described in the previous section. Traffic and transportation effects would be the same as those described above.

Under Alternative 2, there would be removal of about 44,000 tons (31,680 yd^3 [24,077 m^3]) of waste from the east slope of the main landfill to the DDA located about 2,500 ft (750 m) to the southeast of the main landfill. Transfer of this volume of waste would require about 1,760 truckloads (one truck-load would transport about 25 tons or 18 yd^3 (1 ton = 0.72 yd^3 [0.55 m^3]) of waste) with the same number of empty return trips to the excavation site. Truck traffic would be restricted to the airport (Figure 2). There would be no additional truck trips over public roads to haul excavated waste offsite. The addition of about 8 to 10 truck trips per day to haul in construction materials to the current volume of about 24,600 vehicle trips on Diamond Drive and about 9,500 vehicle trips on East Jemez Road would have a negligible effect on traffic in the area.

3.3.4 Alternative 3, Complete Excavation of the Main Landfill

Implementing this alternative would have incremental effects on East Jemez Road and connecting roads because of the large number of trucks that could logistically travel on these roads. Truck traffic would be restricted to the daylight hours between 9:30 AM and 3:30 PM. Under Alternative 3, about 680,400 yd^3 (517,104 m^3) of excavated material would be excavated and hauled out of the main landfill to a licensed solid waste landfill such as Rio Rancho, about 100 mi (161 km) from the main landfill. Transfer of this volume of waste would require about 75,600 roundtrips (including return trips with empty haulers or haulers loaded with backfill) traveling through the town site to East Jemez Road and off-site to New Mexico public highways. One truckload would transport about 25 tons or about 18 yd^3 (14 m^3); one ton of waste would be equal to a volume of about 0.72 yd^3 (55 m^3).

Since it would require 75,600 roundtrips to remove the total volume of excavated waste and since one truck could make 312 roundtrips per year (six days per week * 52 weeks per year), this would result in 242 trucks working full time for one year to complete waste removal. Los Alamos County would restrict trucks to operating between 9:30 AM and 3:30 PM (6 hours per day), six days per week. Trucks would be filled with waste at the Airport landfill, would travel through the town site to East Jemez Road and on to state highways to a licensed disposal facility such as Rio Rancho. It is estimated that due to the time constraints of the operating hours in Los Alamos and the time estimated to fill each truck (about 15 minutes) and travel time from Los Alamos to Rio Rancho (about two hours), one truck would be restricted to one trip per day. If a different contractor were used to haul in back-fill material, the number of total roundtrips could double to 151,200.

However, one of the limiting factors would be the loading of the truck at the Airport; 242 trucks could not be loaded in one six-hour day (one truck every 1.5 minutes). If a front-end loader could fill one truck every 15 minutes, then in six hours, 24 trucks could be filled with waste. If 2 front-end loaders were working simultaneously, then 48 trucks could be filled in one six-hour day if 48 trucks would be available. At this rate (filling 48 trucks per day), it would take five years to accomplish removal of the main landfill waste (Table 5).

Table 5. Summary of Truck Usage for Complete Excavation

Front-end loaders working simultaneously	Number of trucks in use per day	Time required (years)
1	24	10
2	48	5
5	120	2
8	192	1.25

The current volume of about 24,600 vehicle trips on Diamond Drive and about 9,500 vehicle trips on East Jemez Road is measured during the hours of 7 AM and 6 PM. Depending on the number of front-end loaders used, the number of trucks would be incrementally added to current volumes shown in Table 4. Traffic through the town site is routinely increased during mid-day hours due to many LANL workers dining downtown or conducting personal business during this time. The flow of traffic on Diamond Drive and Trinity Drive, the community's arterial route, would be slowed down by truck traffic especially during mid-day.

3.3.5 No Action Alternative

Under the No Action Alternative, the Airport Landfills would not undergo corrective measure activities. There would be no additional transportation needs or truck transport trips generated by the movement of people, services, goods, and wastes related to the Airport Landfills.

3.4 Ecological Resources

3.4.1 Affected Environment

The Airport Tract occupies the mesa top adjacent to and above Pueblo Canyon. The vegetation of the tract, covering about 60 percent of the land area, is primarily ponderosa pine forest; piñon-juniper woodland; and open shrub, grassland, and wildflower areas. The remaining 40 percent of the area is developed as roadway, parking lots, runway, and buildings. The flora and fauna are typical of the region. There are no perennial surface water courses or floodplains within the tract. A small willow-dominated wetland exists in the bottom of DP Canyon near the top of the drainage. This wetland overlaps portions of the airport and TA-21 tracts. A further description of the wetlands and floodplains can be found in Appendix D of the Conveyance and Transfer EIS (DOE 1999a).

Foraging habitat is present for the bald eagle and Mexican spotted owl. Los Alamos Canyon and Pueblo Canyon AEIs overlap the Airport Tract for the Mexican spotted owl. Noise is generated from vehicle traffic utilizing SR 502 and from aircraft landings and takeoffs. The Airport Tract is lighted at night by runway lights and beacons at the airport and by adjacent residential areas.

Corrective measure activities may remove or disturb potentially suitable Mexican spotted owl habitat. If the project actions are delayed until the start of the 2005 breeding season (March 1 – August 31), surveys would be performed prior to the start of work and follow-up notification would be given to the USFWS to determine if formal consultation under the ESA is necessary. Because the proposed corrective measure activities to be undertaken at the Airport Landfills are outside the established guidelines in the Habitat Management Plan for Threatened and Endangered Species (LANL 1998b), a Biological Assessment (LANL 2004b) was conducted to evaluate the potential effects of these certain

activities. The USFWS concurred with DOE's determination of "may affect, but not likely to adversely affect" the Mexican spotted owl for the proposed actions.

3.4.2 Alternative 1, MatCon™ Cover and Retaining Wall

Under this alternative, disturbance of Mexican spotted owl habitat would be possible. This activity may affect but is not likely to adversely affect the habitat. Vegetation disturbance would be minimized by BMPs as described in Section 2.1. All exposed soils would be revegetated with native plants as soon as feasible after construction to minimize erosion. When the Airport Landfills Tract is transferred to Los Alamos County, effects to ecological resources would be limited to the changes in responsibility for resource protection. Environmental review and protection processes for future activities would not be as rigorous as those that govern DOE activities (DOE 1999a).

3.4.3 Alternative 2, MatCon™ Cover and Rock Armor

Implementation of Alternative 2 would have the same effects as described for Alternative 1. Under this alternative, disturbance of Mexican spotted owl habitat would be possible. This activity may affect but is not likely to adversely affect the habitat. All exposed soils would be revegetated with native plants as soon as feasible after construction to minimize erosion. When the Airport Landfills Tract is transferred to Los Alamos County, the effects to ecological resources would be the same as described above.

3.4.4 Alternative 3, Complete Excavation of the Main Landfill

Implementation of Alternative 3 would have the same effects as described for Alternative 1. Under this alternative, disturbance of Mexican spotted owl habitat would be possible. This activity may affect but is not likely to adversely affect the habitat. Exposed soil resulting from excavation activities would be revegetated with native plants as soon as practicable to minimize erosion. When the Airport Landfills Tract is transferred to Los Alamos County, the effects to ecological resources would be limited to the changes in responsibility for resource protection as described above.

3.4.5 No Action Alternative

Under the No Action Alternative, construction and excavation activities would not occur. Effects on biological resources would be unchanged. Under the No Action Alternative, there would be no effect on threatened or endangered species or their potential critical habitat in the Los Alamos area.

3.5 Noise

3.5.1 Affected Environment

The Airport Landfills lie adjacent to East Road. Vehicular traffic from the highway is the major source of ambient noise for this tract of land. The takeoff and landing of small airplanes contribute intermittently to noise levels. Ambient noise levels vary with distance from the highway. At the northern edge of TA-73, the edge more distant from the highway, ambient noise levels are estimated to be less than 40 decibels, A-weighted (dBA). At the southern edge, along the highway, background levels are likely to be in the range of 60 to 70 dBA during the daytime.

3.5.2 Alternative 1, MatCon™ Cover and Retaining Wall

No adverse or long-term effects on workers at LANL, the public, or the environment would be expected from noise levels generated by activities planned under this alternative. Implementation of Alternative 1 could result in a temporary increase in noise levels associated with various activities proposed for the Airport Landfills.

The construction of a new MatCon™ cover over the main landfill and installation of an ET cover over the DDA would require the use of heavy equipment for clearing, leveling, and construction activities. Heavy equipment such as front-end loaders and backhoes would produce intermittent noise levels at around 74 to 95 dBA at a distance of 50 ft (15 m) from the work site under normal working conditions (Canter 1996; Magrab 1975). Construction truck traffic would occur frequently but would generally produce noise levels below that of the heavy equipment. PPE would be required if site-specific work produced noise levels above the action level at LANL of 82 dBA.

Noise generated by activities under this corrective measure alternative would be temporary (up to 12 months), of low to moderate intensity, highly localized, and would be consistent with noise levels in nearby developed areas or on existing roads at LANL. At the completion of these activities, noise levels would return to existing levels. Noise generated by implementation of this alternative would not be expected to have an adverse effect on either LANL or site workers or members of the public.

3.5.3 Alternative 2, MatCon™ Cover and Rock Armor

Noise effects under Alternative 2 would be essentially the same as those discussed previously under Alternative 1. These operations would continue to have only a temporary and minor effect on noise levels.

3.5.4 Alternative 3, Complete Excavation of the Main Landfill

Noise effects under Alternative 3 would be essentially the same as those discussed previously under Alternative 1. These operations would continue to have only a temporary and minor effect on noise levels over the implementation period.

3.5.5 No Action Alternative

Under the No Action Alternative, the Airport Landfills would not undergo corrective measure activities. Ambient noise levels would remain unchanged in the vicinity of the airport. Environmental noise levels in and around the airport would be expected to remain below 80 dBA on average.

3.6 Water Resources (Surface and Ground)

3.6.1 Affected Environment

The Airport Landfills Tract is located on the mesa top between Pueblo Canyon on the north and DP Canyon on the south and the boundaries of the tract extend to the bottom of these canyons. Both canyons are ephemeral drainages in the vicinity of the tract. Both Pueblo and DP Canyons receive

storm water run-off and snowmelt from the mesa top and surrounding areas. DP Spring flows from the DP Canyon wall but does not maintain flow into the canyon bottom. A discussion of the wetland in the bottom of DP Canyon is included in Appendix D of the Conveyance and Transfer EIS (DOE 1999a).

There are no perennial or ephemeral streams or stream channels within the TA-73 boundaries. Surface water is limited to storm water; most of the surface drainage of TA-73 flows to Pueblo Canyon, generally as sheet flow off the mesa top. The ephemeral stream in Pueblo Canyon flows only in the spring as snow is melting and during extended moderate to heavy rainfall events.

Groundwater was not encountered within or beneath the main landfill during the RFI (LANL 1998a). Because the landfill is located on the top of a mesa bounded by deep, steep-walled canyons to the north and south, it is situated far above perched groundwater that has been encountered beneath the canyon bottoms. The elevation of the main aquifer is about 6,000 ft (1,800 m), more than 1,000 ft (300 m) below the level of the mesa top at TA-73. No perched or alluvial aquifers were encountered beneath the main landfill.

3.6.2 Alternative 1, MatCon™ Cover and Retaining Wall

Water quality in the area would not be affected by implementation of Alternative 1. BMPs, as specified in the Storm Water Pollution Prevention Plan, would be employed during construction to restrict surface water movement and minimize soil erosion that could degrade surface water quality. Post-construction landscaping would also serve to protect surface and groundwater quality.

No new outfalls, wastewater, or waste streams would be created by implementing this alternative. Water quality would not change as a result of installing a MatCon™ cover and retaining wall on the main landfill or an ET cover on the DDA. Installation of the MatCon™ cover would decrease surface water infiltration into the main landfill and is not expected to have any adverse effects on groundwater quality. Storm water and surface runoff BMPs would be addressed in the revised Phase II Work Plan being prepared over the next three months. These BMPs would direct surface run-off offsite into Pueblo Canyon which drains away from the town site. No downstream flooding is expected from this run-off. BMPs would also be designed to minimize erosion.

3.6.3 Alternative 2, MatCon™ Cover and Rock Armor

Water quality effects under Alternative 2 would be essentially the same as those discussed previously under Alternative 1. Implementation of this alternative is not expected to have any adverse effects on surface water and groundwater quality. Storm water and surface run-off BMPs would be the same as discussed above for Alternative 1.

3.6.4 Alternative 3, Complete Excavation of the Main Landfill

Implementation of Alternative 3 is not expected to have any adverse effects on groundwater quality. Surface water quality would not change as a result of excavating the waste, backfilling with soil, and installing an asphalt surface on the main landfill and an ET cover on the DDA.

3.6.5 No Action Alternative

Under the No Action Alternative, the Airport Landfills would be left in its current state. Groundwater and surface water quality would not likely be adversely affected from implementation of the No Action Alternative.

3.7 Air Quality

3.7.1 Affected Environment

Air quality at the Airport Tract is primarily affected by LANL operations at TA-21 and the Los Alamos Neutron Science Center (LANSCE). Pollutant contributors also arise from traffic on East Road and from the airplanes that use the Los Alamos Airport.

The Airport Tract is part of New Mexico Region 3, an attainment area that meets NAAQS for criteria pollutants. Except for small amounts of carbon monoxide and ozone resulting from hydrocarbons emitted from motor vehicles and airplanes, there are no sources of criteria pollutants within the tract itself.

There are no sources within the tract that emit hazardous or other chemical air pollutants, so concentrations of these pollutants at the tract are the result of other activities, primarily those at TA-21. Analysis shows that about 130 different chemicals have been or are being used at TA-21. However, short-term exposures resulting from inhalation of chemical air pollutants at points along the current boundaries of TA-21 were all estimated to be less than health-based standards (which implies that concentrations at the airport would likely be lower), and there are no anticipated adverse health effects. Likewise, long-term exposures (such as for sensitive receptors in Los Alamos and nearby areas) also were estimated to be less than health-based standards (DOE 1999b).

Just off the eastern edge of this tract (Eastgate) is the location of the maximally exposed individual (MEI) for radiation doses from all of LANL's operations. The estimated dose from air pollutants for the Eastgate MEI in 2004 was about 2 millirem (mrem), which assumes an individual resided there for 24 hours per day for 365 days. At the western edge (the airport terminal and nearby houses), the dose is estimated to be about 1 mrem.

Mobile sources, such as automobiles and construction vehicles, are additional sources of air emissions; however, mobile sources are not regulated by NMED. Diesel emissions from conveyance vehicles are not regulated as stationary sources of emissions. Mechanical equipment including bulldozers, excavators, backhoes, cranes, tamper compactors, trenchers, and drill rigs are exempt from permitting under Title 20 of the NMAC Part 2.72, *Construction Permits*. This type of exemption does not require notification to NMED.

Both EPA and NMED regulate nonradioactive air emissions. NMED does not regulate dust from excavation or construction, but LANL workers take appropriate steps during construction activities to control fugitive dust and particulate emissions using, for example, best achievable control measures of water sprays or soil tackifiers. Excavation and construction activities are not considered stationary sources of regulated air pollutants under the New Mexico air quality requirements; these activities are

not subject to permitting under 20 NMAC, Parts 2.70 and 2.72. Annual dust emissions from daily windblown dust are generally higher than short-term construction-related dust emissions.

3.7.2 Alternative 1, MatCon™ Cover and Retaining Wall

No change to the air quality in the Los Alamos airshed would be expected to result from implementing Alternative 1. The LANL area would remain an attainment area for air quality. Corrective measure operations would conform to applicable NMED and EPA permitting requirements for LANL.

There would be a temporary increase in localized particulate emissions (dust). Use of heavy equipment and vehicles would also cause an increase in NO_x emissions for short-term temporary periods. Control measures such as water-spraying or the use of tackifiers would be utilized to suppress dust generated during remediation activities. Landfill gases would continue to evolve and would be managed by a gas venting layer or gravel layer constructed on top of the landfill sub-grade as described in Section 2.1.1.

3.7.3 Alternative 2, MatCon™ Cover and Rock Armor

No change to the air quality in the Los Alamos airshed would be expected to result from the implementation of Alternative 2. The effects to air quality would be the same as described for Alternative 1. Remediation activities would produce temporary, localized particulate and NO_x emissions (dust and vehicle exhaust). Fugitive dust would be controlled by water-spraying or the use of tackifiers. Landfill gases would continue to evolve and would be managed by a gas venting layer or gravel layer constructed on top of the landfill sub-grade as described in Section 2.1.2.

3.7.4 Alternative 3, Complete Excavation of the Main Landfill

No change to the air quality in the Los Alamos airshed would be expected to result from implementing Alternative 3. The LANL area would remain an attainment area for air quality. Corrective measure operations would conform to applicable NMED and EPA permitting requirements for LANL.

Dust or particulate matter would result from excavating, transporting, and storing soil and waste from the main landfill over the short term. Particulate emissions would be controlled with specific best available control measures, such as wetting soil or applying tackifiers, that would be implemented for the removal operations. Potential localized air quality effects would be temporary.

3.7.5 No Action Alternative

No change to the air quality in the Los Alamos airshed would be expected to result from implementing the No Action Alternative. Under the No Action Alternative, particulates would continue to be emitted from the main landfill at very low levels similar to current levels. These levels are well below the threshold limits established by the *Clean Air Act* (40 CFR 50). LANL would continue to be in compliance with air quality standards and the air quality attainment status of the area would not change.

3.8 Human Health

3.8.1 Affected Environment

TA-73, which encompasses the airport, is located across DP and Los Alamos Canyons from LANL's LANSCE, which is the primary source of radioactive emissions as measured for the LANL off-site MEI. This eastern tip of this land tract is just a little farther from LANSCE than the MEI. This tract is currently leased by the County, and LANL has no operational facilities there. The dose from LANSCE to non-LANL personnel on this site would be less than that to the MEI. The current estimated doses are about 2 mrem per year to the MEI and about 1 mrem at the western edge of the tract. These doses are well within the EPA standard of 10 mrem per year. Individuals at the Airport Tract are also assumed to be Los Alamos residents who would receive the area background dose.

Under current conditions, landfill gases, primarily methane and carbon dioxide associated with the decomposing refuse, are present in the subsurface. Human health risks from soil gas and surface contamination were evaluated for a variety of potential exposure scenarios (LANL 1998a). For exposure scenarios consistent with current land use, the health risk to workers at the airport terminal, visitors to the tie-down areas, and offsite residents was low and within the acceptable range as set forth by EPA (LANL 1998a).

3.8.2 Alternative 1, MatCon™ Cover and Retaining Wall

There would be negligible health risks from LANL operations. Implementation of any corrective measure alternative at the Airport landfills would provide long-term beneficial impacts through the reduction of potential risks from contamination. Implementation of Alternative 1 would serve to further reduce the potential for health impacts which are low in its current, unmitigated state. The contemplated use for this site is to continue or expand airport operations with the continuation of access restrictions to the landfill areas.

3.8.3 Alternative 2, MatCon™ Cover and Rock Armor

Implementation of Alternative 2 would have the same effects as described for Alternative 1. This alternative would not be expected to result in an adverse effect on the health of construction workers. Continued use of the landfill areas by the airport would entail access restrictions to the landfill areas.

3.8.4 Alternative 3, Complete Excavation of the Main Landfill

Complete excavation may pose health risks to workers, although personal protection programs would be a routine part of the excavation procedure. Excavation would result in the venting of landfill gases such as methane and carbon dioxide which could potentially affect workers and residents to the north if the wind is blowing from a southerly direction. Effects of these gases would be minimized by the use of protective equipment for workers and by dissipation of the released landfill gases in the atmosphere. Implementation of any corrective measure alternative at the Airport landfills would provide long-term beneficial impacts through the reduction of potential risks from contamination.

3.8.5 No Action Alternative

Under the No Action Alternative, there would be no potential for injuries to construction workers and members of the public. There would be no exposures to heavy equipment operation because no remediation activities would take place.

Table 6 presents a summary of environmental consequences for each of the corrective measure alternatives discussed in detail in previous sections. For the most part, environmental effects would be minor and would be similar among the alternatives analyzed. The exception is the effects to land use and traffic resulting from implementation of the complete excavation alternative.

3.9 Environmental Justice

3.9.1 Affected Environment

Environmental justice impacts occur if there are any disproportionately high and adverse human health or environmental effects on minority or low-income populations that could result from the actions undertaken by DOE. LANL maintains a monitoring site just below the landfill area to detect the release of any potential contaminants in the unlikely event that migration should occur, although no known contaminants have ever left the main landfill site since 1943.

3.9.2 Corrective Measure Alternatives

Implementation of any corrective measure alternative at the Airport landfills would provide long-term beneficial impacts through the reduction of potential risks from contamination. As indicated in Sections 3.2, 3.4, 3.5, 3.6, 3.7, and 3.8 of this EA, no substantive adverse impacts to land use, ecological resources, noise, water resources, air quality, and human health are anticipated under any of the corrective measure alternatives. The one exception is the impact to traffic and transportation if Alternative 3, complete excavation of the main landfill and disposal off-site, were to be implemented. Under this alternative as discussed in Section 3.3.4, LANL and the community of Los Alamos would be adversely affected more than surrounding communities due to the logistics of the concentration of truck traffic on local roadways. Thus, no disproportionately high or adverse impacts to minority or low-income communities are anticipated to be associated with any of the corrective measure alternatives.

EPA recommends the following criteria as general goals for potential corrective measure remedies:

- **Protect human health and the environment and**
- **Control the source(s) of release so as to reduce or eliminate, to the extent practicable, further releases of hazardous waste or hazardous constituents that may pose a threat to human health and the environment**

3.9.3 Alternative 1, MatCon™ Cover and Retaining Wall

Under alternative 1, there would be no waste removal from the main landfill. There would likely be no short-term or long-term disproportionate adverse effects to minority populations subject to environmental justice concerns. Implementation of Alternative 1 would have a beneficial effect to adjacent landowners and workers because of the enhanced containment of the landfill waste. The final MatCon™ surface cap and engineering controls would be designed and constructed so as to meet all run-on and run-off surface-water requirements and minimize any downward movement of leachate and condensate.

3.9.4 Alternative 2, MatCon™ Cover and Rock Armor

Implementation of Alternative 2 would provide the same beneficial effects as discussed for Alternative 1. There would be no off-site waste transportation. Environmental justice effects would be the same as those for Alternative 1.

3.9.5 Alternative 3, Complete Excavation of the Main Landfill

No long-term issues regarding environmental justice would be expected as a result of implementing Alternative 3. Transporting wastes from LANL to another location would require that trucks use roads that traverse or are located near minority and low-income communities, including the Pueblos of San Ildefonso and Pojoaque, and possibly others depending upon the selected route to a disposal site. There would be a possible adverse effect to all communities due to increased truck traffic. Implementation of Alternative 3 would minimize the potential of possible future releases of contamination from the main landfill because clean fill would replace the excavated waste.

3.9.6 No Action Alternative

There would likely be no short-term or long-term disproportionate adverse effects to minority populations subject to environmental justice concerns under the No Action Alternative. As discussed in Sections 3.6, 3.7, 3.8, implementation of any of these corrective measure options would not be expected to adversely affect water or air quality or result in any contaminant releases above regulatory limits.

Table 6. Summary of Environmental Consequences for the Airport Landfills Corrective Measure Alternatives

Resource	No Action Alternative	Alternative 1 MatCon™ Cover and Retaining Wall	Alternative 2 MatCon™ Cover and Rock Armor	Alternative 3 Complete Excavation of the Main Landfill
Land Use	No impact	Remediation of the landfill would render this tract suitable for transfer to Los Alamos County	Remediation of the landfill would render this tract suitable for transfer to Los Alamos County	Potential delay in land transfer; however, remediation of the landfill would render this tract suitable for transfer to Los Alamos County
Traffic and Transportation	No impact	No waste removal over public roads; 8 to 10 truck trips per day over a 12-month period to import construction materials	No waste removal over public roads; 8 to 10 truck trips per day over a 12-month period to import construction materials	75,000/151,200 roundtrips over a 5-year period
Ecological Resources	No impact	May affect but is not likely to adversely affect the Mexican spotted owl AEI; environmental review and protection processes for future activities would be less rigorous than current processes	May affect but is not likely to adversely affect the Mexican spotted owl AEI; environmental review and protection processes for future activities would be less rigorous than current processes	May affect but is not likely to adversely affect the Mexican spotted owl AEI; environmental review and protection processes for future activities would be less rigorous than current processes
Noise	No impact	Temporary increase in noise levels	Temporary increase in noise levels	Temporary increase in noise levels
Water Resources (Ground and Surface)	No impact	BMPs would be implemented to direct surface run-on and runoff	BMPs would be implemented to direct surface run-on and runoff	BMPs would be implemented to direct surface run-on and runoff
Air Quality	Particulates would continue to be emitted from the main landfill at very low levels similar to current levels.	Temporary increase in localized particulate emissions (dust), NO_x emissions	Temporary increase in localized particulate emissions (dust), NO_x emissions	Temporary increase in localized particulate emissions (dust), NO_x emissions
Human Health	No impact	Not expected to result in an adverse effect on the health of construction workers	Not expected to result in an adverse effect on the health of construction workers	Not expected to result in an adverse effect on the health of construction workers
Environmental Justice	No impact	Beneficial effect due to enhanced containment	Beneficial effect due to enhanced containment	Possible adverse effect to all communities due to increased truck traffic

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4.0 Accident Analysis

Implementation of any corrective measure alternative at the Airport Landfills would involve either containment and capping or excavation and complete removal of the waste inventory of the main landfill. NEPA guidance recommends the use of a sliding-scale approach for considering, analyzing, and reporting accidents that might occur for any proposed action (DOE 2002). As such, only the risk-dominant accidents for the excavation and removal corrective measure options were chosen to represent the spectrum of postulated accidents considered and analyzed for the proposed action and discussed in this chapter. The excavation and removal corrective measure alternative including associated transportation poses the greatest risk to members of the public, albeit a small one. The risk to the public from all other activities is negligible. The risk to workers is dominated by standard industrial accidents most associated with site excavation activities.

Hazards for any corrective measure alternative can be grouped into construction hazards and transportation hazards. No fatalities are likely to result from any construction or transportation accident scenarios.

4.1 Construction Hazards

Potentially serious exposures to various hazards or injuries are possible during the construction phases of the proposed action. Adverse effects could range from relatively minor (e.g., lung irritation, cuts, or sprains) to major (e.g., lung damage, broken bones, or fatalities). To prevent serious exposures and injuries, all site construction contractors are required to submit and adhere to a Construction Safety and Health Plan (Plan). Applicable safety and health training and monitoring, PPE, and work-site hazard controls would be required for workers at the Airport Landfills. This Plan would be reviewed and approved by NNSA staff before remediation activities can begin. Following approval of this Plan, NNSA site inspectors would routinely verify that construction subcontractors are adhering to the Plan, including applicable federal and state health and safety standards. In addition, site-specific hazard training (e.g., construction safety, waste handling, etc.) would be provided to construction contractors as needed. Adherence to an approved Construction Safety and Health Plan and completion of appropriate hazards training is expected to prevent any major adverse effects on construction workers.

An estimate of the potential number of fatalities that might occur from construction-related activities of the proposed action was derived from recent risk rates of occupational fatalities for all industries. The average fatality rate in the U.S. is 3.9 deaths per 100,000 workers per year (Saltzman 2001). If the peak construction period for the excavation and removal alternative is assumed to last for one year, no deaths (0.0019) would be expected for the estimated 50 onsite workers from construction-related activities that include falls, exposure to harmful substances, fires and explosions, transportation incidents, and being struck by objects, equipment, or projectiles. Excavation of the waste would pose more threat to human health from accidents than leaving the waste in place and capping; however, even excavation is relatively safe because it is not an extraordinary action for site remediation workers. Potential accidents involving aircraft would be minimized by the procedures and controls discussed in Section 2.1.

4.2 Transportation Hazards

Transportation hazards are associated with construction activities. Construction activities would involve the transport of building materials to the Airport Tract at TA-73. Of the different types of transportation occupations nationwide, truck drivers, including all types of trucks, experience the highest fatality rate (26 deaths per 100,000 full-time workers per year) (DOL 2003).

Transportation activities could also involve the transport of excavated waste from the main landfill to an approved off-site disposal facility, such as Rio Rancho. If the excavation and removal alternative were selected, about 37,800 loads could be transported. The transportation activities for this activity would constitute a minor fraction of the amount of travel on which transportation fatality rates for industry are based. No statistics were found for trucks hauling materials on special roads such as the airport access road; however, the long distances and higher speeds that are included in the national statistics would be uncommon in this project and the number of driver-years would be very low, therefore no transportation fatalities are expected for this project.

5.0 Cumulative Effects

Cumulative effects on any affected resources as a consequence of implementation of any corrective measure alternative are expected to be negligible. Cumulative effects are caused by the aggregate of past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes them. These effects can result from individually minor, but collectively significant, actions taking place over a period of time (40 CFR 1500-1508). The cumulative effect analysis in the LANL SWEIS already documents the regional effect of the expanded operations alternative and provides context for this EA. This section evaluates the cumulative effects of implementing any corrective measure alternative and the No Action Alternative with the effects resulting from common issues of other actions that have, are, and will be taken at LANL or by adjacent jurisdictions.

Specific Resources

Several resources were dismissed from cumulative effects consideration because they would not be affected by the alternatives and could not contribute collectively to ongoing or reasonably foreseeable actions (see Table 2). These were waste management, geology (and soils), utilities and infrastructure, socioeconomics, environmental justice, floodplains and wetlands, and visual and cultural resources. Five other resources analyzed in this EA would not contribute significantly to cumulative effects, because the proposed action would not have major long-term or irreversible effects on air quality, water quality, noise, human health, and biological resources. Land use and traffic and transportation are discussed further in this section. This analysis concludes that there would not be cumulative effects on traffic and transportation or other aspects of the environment. Moreover, some positive effects to resources, such as land use, would occur as a consequence of the alternatives implementing a corrective measure at the Airport Tract within TA-73.

Land Use

Cumulative effects are postulated to be additive. Remediation of the Airport Landfills would render this tract suitable for transfer to Los Alamos County. As of March 2005 and in accordance with Congressional mandate, approximately 2,239 ac (896 ha) of land have been conveyed or transferred to Los Alamos County and the Pueblo of San Ildefonso. Remediation of the Airport Landfills would result in the eligibility of this additional land tract for transfer to Los Alamos County. Implementation of a corrective measure option at the Airport Landfills would provide long-term beneficial impacts through the transfer of this land parcel to the County of Los Alamos and would allow for the future contemplated use of this land for expansion of the existing Los Alamos Airport. The size of LANL has already changed because of recent land transfers. Transfer of this land parcel would further decrease LANL's boundary.

Traffic and Transportation

Cumulative effects to transportation are assessed by combining the number of trips anticipated to be generated by the proposed corrective measures with the transportation impacts of other existing and planned developments. Some actions that would likely occur at LANL that might cause cumulative effects in the area of the transportation would include any construction or demolition projects that

would affect traffic on LANL access or egress roads. Existing and future demolition and construction activities and expansion of existing projects that could result in increased traffic on roadways include

- Chemistry and Metallurgy Research Building Replacement Project,
- Relocation of TA-18 materials and activities and possible demolition of existing facilities,
- Remediation of major material disposal areas and canyons,
- Closure of the Los Alamos County landfill,
- LANSCE Refurbishment Project,
- Radioactive Liquid Waste Treatment Facility modification and construction,
- Relocation of LANL warehouse operations and truck inspection station,
- Construction of new facilities on Two-Mile Mesa,
- TA-55 Radiography Facility Replacement,
- TA-55 Re-investment Project,
- Construction of the Center for Stockpile Stewardship and Research in TA-3,
- Off-site Source Recovery Project,
- Construction of Modern Radiological Facility at TA-48, and
- Expansion of Biosciences Division operations.

If these construction and demolition projects were to take place in the same timeframe as the proposed corrective measures described in this EA, additional construction traffic analyzed in Section 3.3 could have a short-term effect on the traffic flow on East Jemez Road, but rarely do these types of activities occur at one time.

This analysis concludes that there could be a positive effect to land use as a consequence of remediation activities because future expansion of the airport could proceed and that there could be minor, temporary effects to the traffic flow on East Jemez Road between 9:30 AM and 3:30 PM if the total excavation corrective measure alternative were selected. Yet, the effects of remediation of the main Airport Landfill, when combined with those effects of other actions defined in the scope of this section, do not result in cumulatively significant impacts.

6.0 Agencies Consulted

Since all significant and potentially significant cultural resources would be protected by avoidance, there is no need for consultation with the New Mexico State Historic Preservation Office.

NNSA has determined that informal consultation with the USFWS regarding the potential effect of the proposed action on Federally protected threatened or endangered species or their critical habitat is necessary. No adverse effect to individual Mexican spotted owls or bald eagles, or to their critical habitat, is expected from the proposed action. The USFWS, in a letter dated July 27, 2004, concurred with this determination that the proposed action "may affect, but not likely to adversely affect" Mexican spotted owls or bald eagles.

The FAA is a cooperating agency in the preparation of this EA due to the proximity of the landfill areas to Los Alamos Airport and Runway 9/27.

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